MY HEALTH MY DATA

MyData 2017
Advancing human centric personal data
Tallinn \ Aug 30th – Sep 1st / Helsinki

Anna Rizzo

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03: CASE STUDIES

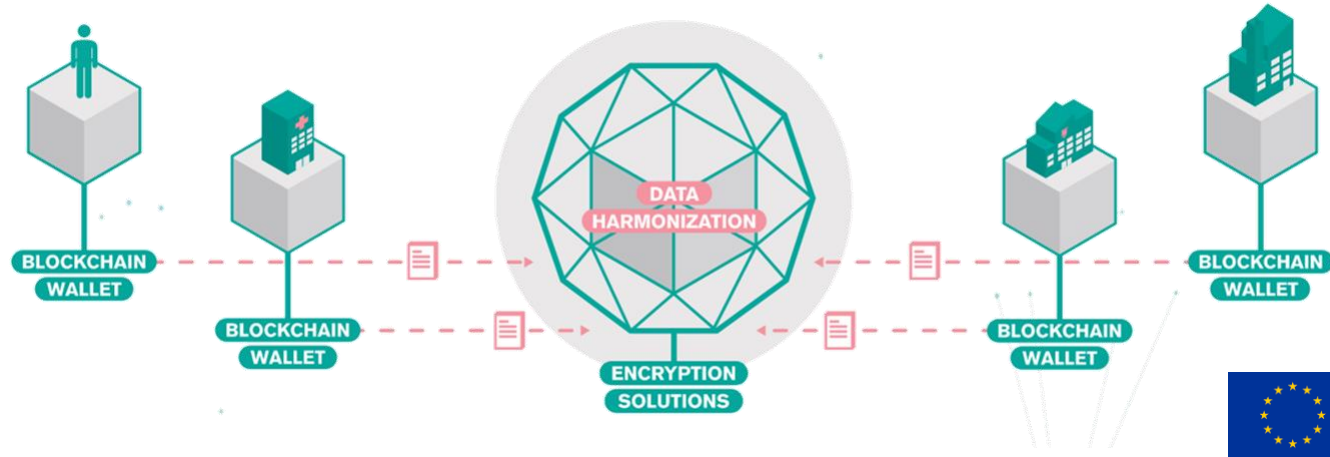From actual to future services : promises and value of the MyData model

Helsinki, August 31 2017

Imagine a world where…

"MY HEALTH, MY DATA"

MyHealthMyData (MHMD) is an H2020 EU-funded research project developing

an European platform for sharing and exchanging PERSONAL HEALTH DATA among *clinical institutions, individuals, research centres and industry* for medical care, research and business purposes.

MHMD at a glance

- **Duration** November 1, 2016 – October 31, 2019

- **Funding** € 3.456.190

- **Consortium**
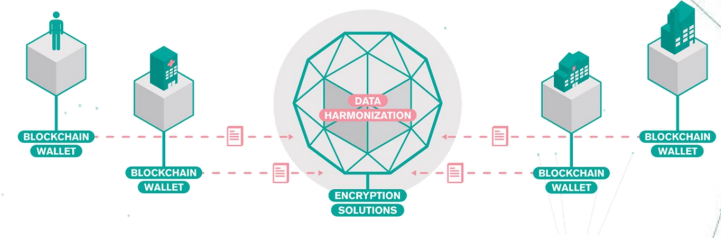
5 SMEs

4 Clinical partners

4 Research centres and Academia

1 Legal consultancy   1 Industry

MHMD mission

CITIZENS' EMPOWERMENT

Grant individuals ownership and control of their personal health data

DATA PRIVACY AND SECURITY

Ensure the strongest privacy protection and health data security

DATA VALUE ENHANCEMENT

Leverage the value of large biomedical datasets for medical care, research and business

How will MHMD do that?

"Gears" (CC BY-ND 2.0) by Charlie Gross Photography

"Gears" (CC BY-SA 2.0) by AJC1

(1) BLOCKCHAIN

Providing certified information

A secure, non-editable digital ledger where:

- **All transactions are confirmed by the network** as entries forming

  blocks of transactions

- **The whole network monitors the legitimacy of each transaction**,

  guaranteeing *a distributed control system*

Applying the blockchain approach to health data guarantees secure access from anywhere on any device

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(2) SMART CONTRACTS

Encoding regulation and implementing it at the speed of light

Self-executing contractual states, based on the formalisation of contractual relations in digital form, **that automate the execution of peer-to-peer transactions** under user-defined conditions.

Regulate data transactions on the blockchain

- *in compliance with the incoming GDPR regulation*
- *allowing to set **use conditions and consent options** for different stakeholders and purposes.*
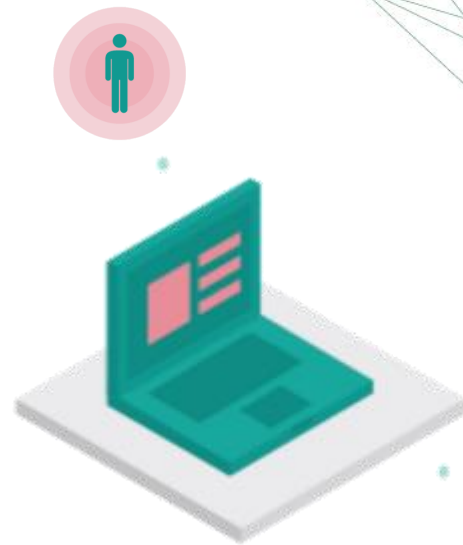
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(3) PERSONAL DATA ACCOUNTS
Individual data ownership and control

Personal storage clouds enabling individuals to access their data from any technological device through the blockchain and employ them for personal use.

Aggregate personal data from disparate sources
(social media accounts, clinical data repositories, personal drives, wearable devices, etc.), in a single, user-owned account

digi.me
it's your life

(4) MULTILEVEL DE-IDENTIFICATION AND ENCRYPTION TECHNOLOGIES

- **Profile and classify** sensitive data
- **Identify** most suitable de-identification and encryption techniques

Encode and de-associate sensible data from the owners' identity, still allowing the application of advanced analytics

(5) PENETRATION AND RE-IDENTIFICATION CHALLENGE

Checking the ability of avoiding privacy & security breaches

"Hacked..." (CC BY-NC-ND 2.0) by Christine Krizsa

- **Active self-hacking (1) and public hacking (2)** simulations

- **Testing external re-identification possibilities** on
    1) *synthetic datasets attributed to virtual patients*
    2) *patients consenting to being used as test-basis*

(6) DATA CATALOGUE

Finding specific data of interest

- Organise datasets so to provide a **database overview**

- Allow researchers to find **what kind of data most suits their needs**

http://maxpixel.freegreatpicture.com/photo-29398

(7) BIG DATA ANALYTICS

Leveraging the value of large biomedical datasets

The project will explore the feasibility of

1. **advanced data analytics** for similarity search, data exploration and patient stratification (*DeepReasoner*)

2. **personalized physiological models** for clinical decision support

3. **machine learning algorithms** for knowledge discovery

4. **data value estimation** models

on *DE-IDENTIFIED AND ENCRYPTED DATA*
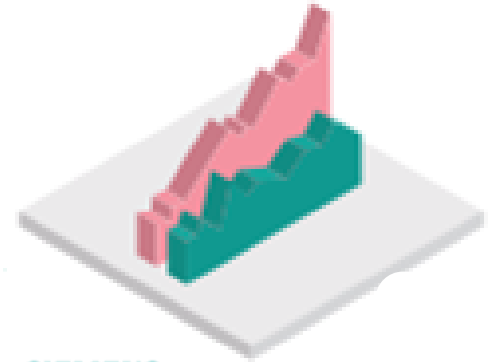
Our vision…

"NetWork" (CC BY-ND 2.0) by goehler.mike

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