

#Imagining2029



**EHTEL**

Collaborating for Digital Health and Care in Europe

# Integrating mobile health data in health service value chains

Health data spaces and ecosystems - Virtual workshop

29/04/2021

 @ehtel\_ehealth

# Welcome and introduction

Experts from 19 countries present

EHTEL members and friends



A WHO/ITU/Andalusian Regional Ministry of Health initiative



**EHTEL**

Collaborating for Digital Health and Care in Europe

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# How do you imagine health and care in 2029 in an era of digital transformation?

## Imagining 2029 Work Programme

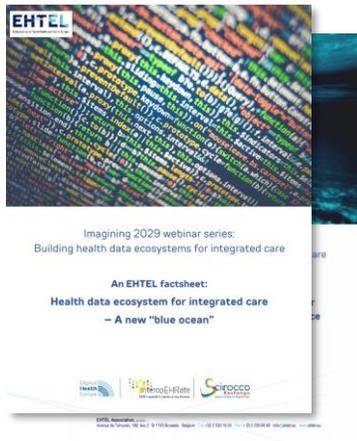
- ▶ Health data spaces and ecosystems
- ▶ Hybrid care
- ▶ Mind the gap

# Last year



## Moving towards European Health Data Space(s)

- ▶ From the European Strategy for Data to Health Data Spaces
- ▶ Architectures and processes enabling data re-use
- ▶ Towards European data spaces for medicines



## Building health data ecosystems

- ▶ Health data ecosystems for integrated care – a new “blue ocean”
- ▶ Deep diving into health data ecosystems for integrated care: sustainability and governance

# This year

## Workshops

- ▶ Integrating mobile health data in health service value chains
- ▶ Building the data-driven hospital and facing the challenges: from EHRs to data ecosystems
- ▶ Outlining reference architectures in the health sector

## EHTEL Symposium 2021

# Agenda

## **Welcome and introduction**

Presenters: Tino Martí and Luc Nicolas (EHTEL)

Time: 10 minutes

## **From mHealth app idea to integrated health service: the More Stamina story**

Presenter: Guido Giunti - University of Oulu (North Ostrobothnia, Finland)

Time: 15 minutes

## **Integrating data from mobile devices into healthcare processes: mConnecta**

Presenter: Yolanda Lupiáñez - TicSalutSocial (Catalonia, Spain)

Time: 15 minutes

## **Wrapping up discussion**

Live poll

Time: 5 minutes

## **Discussion**

Front row: Eirik Årsand (Norwegian Centre for E-health Research, Norway), Heather Cook (ORCHA, United Kingdom), Javier Ferrero and Belen Sotillos (European mHealth Hub), Markus Kalliola (SITRA, Finland)

Time: 40 minutes

## **Conclusions**

Key messages of the workshop and announcement of next session.

Time: 5 minutes

# Goals of this workshop

- Explore different paths to integrate patient-generated data through mobile applications into health data ecosystems for improving clinical work and generate value.
- Reflect on the organisational, technical and human challenges encountered by health organisations and mHealth apps developers and how they could be overcome to accelerate the uptake of mobile solutions and enrich health data ecosystems.

# From mHealth app idea to integrated health service: the More Stamina story



Guido Giunti MD PhD

 [guido.giunti@oulu.fi](mailto:guido.giunti@oulu.fi)

 [buscandoagodot](https://twitter.com/buscandoagodot)

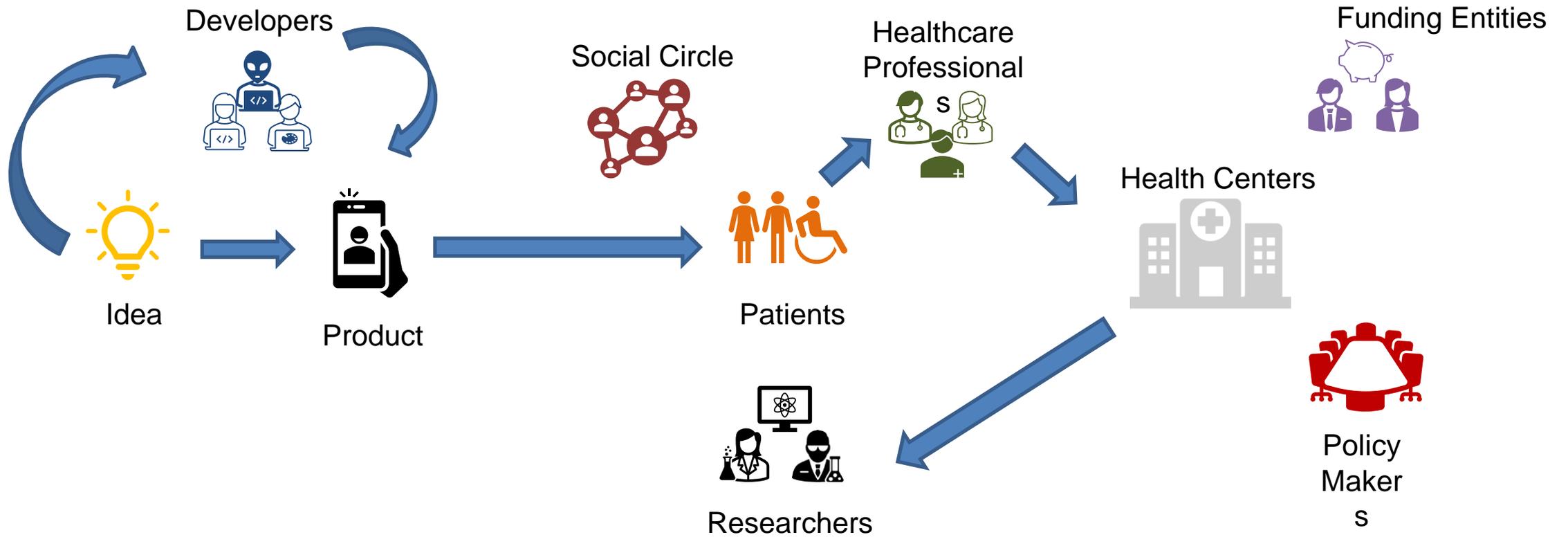




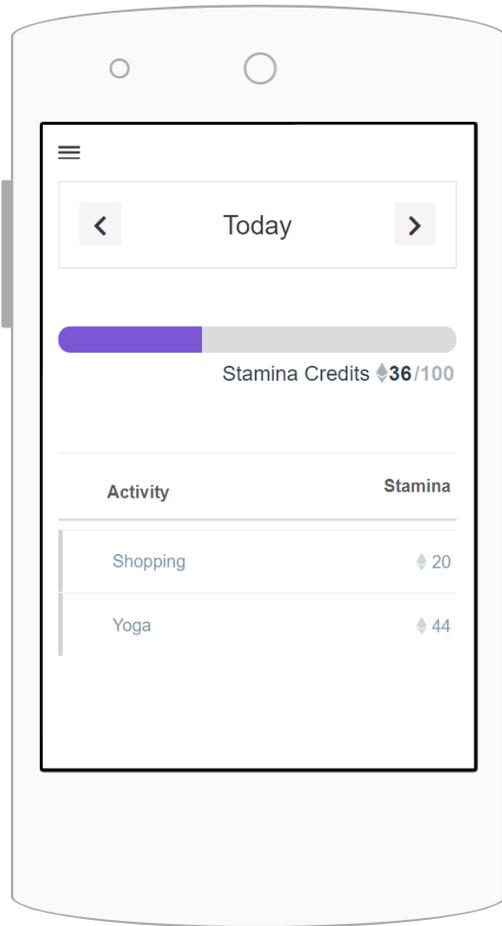




# TYPICAL MHEALTH JOURNEY



# MORE STAMINA



More Stamina is a digital health solution for people with Multiple Sclerosis to help them manage their fatigue



As they keep track of their day, the app learns how to provide personalized recommendations



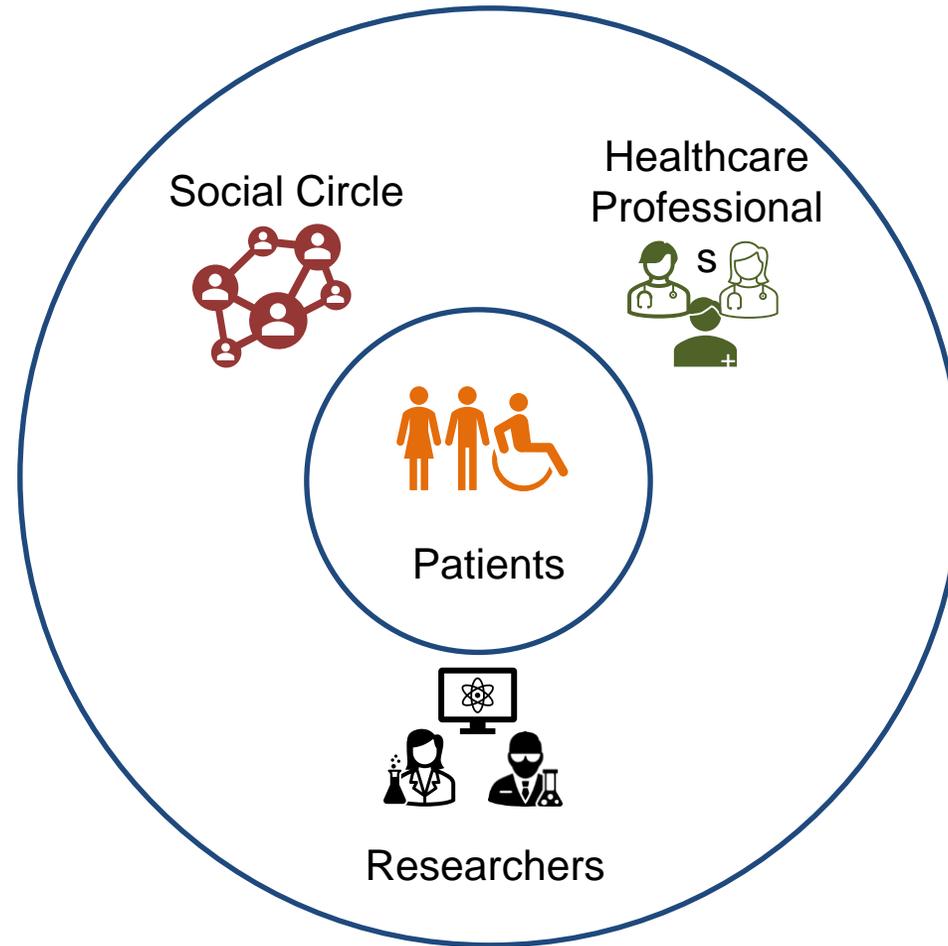
The aggregated data is gathered and used to discover hidden characteristics of MS



User-centered design was followed and every step of the process is evidence-based



# MORE STAMINA'S JOURNEY



# UNDERSTANDING MULTIPLE SCLEROSIS NEEDS

- We did a series of **focus groups and interviews** with persons with MS and healthcare professionals from a neurological rehabilitation center to discover their most pressing needs and expectations from digital health.

“I just don’t know what to do sometimes. I think that if I do too much I’ll have no energy left and it will mess up my whole day.”

“If there was something that could measure how much energy I have left for the day and how much I've already used so far. That would be amazing.”

“There’s so much information online that it’s hard to know what to pay attention to. It would be really helpful if there was just one place I can rely on.”



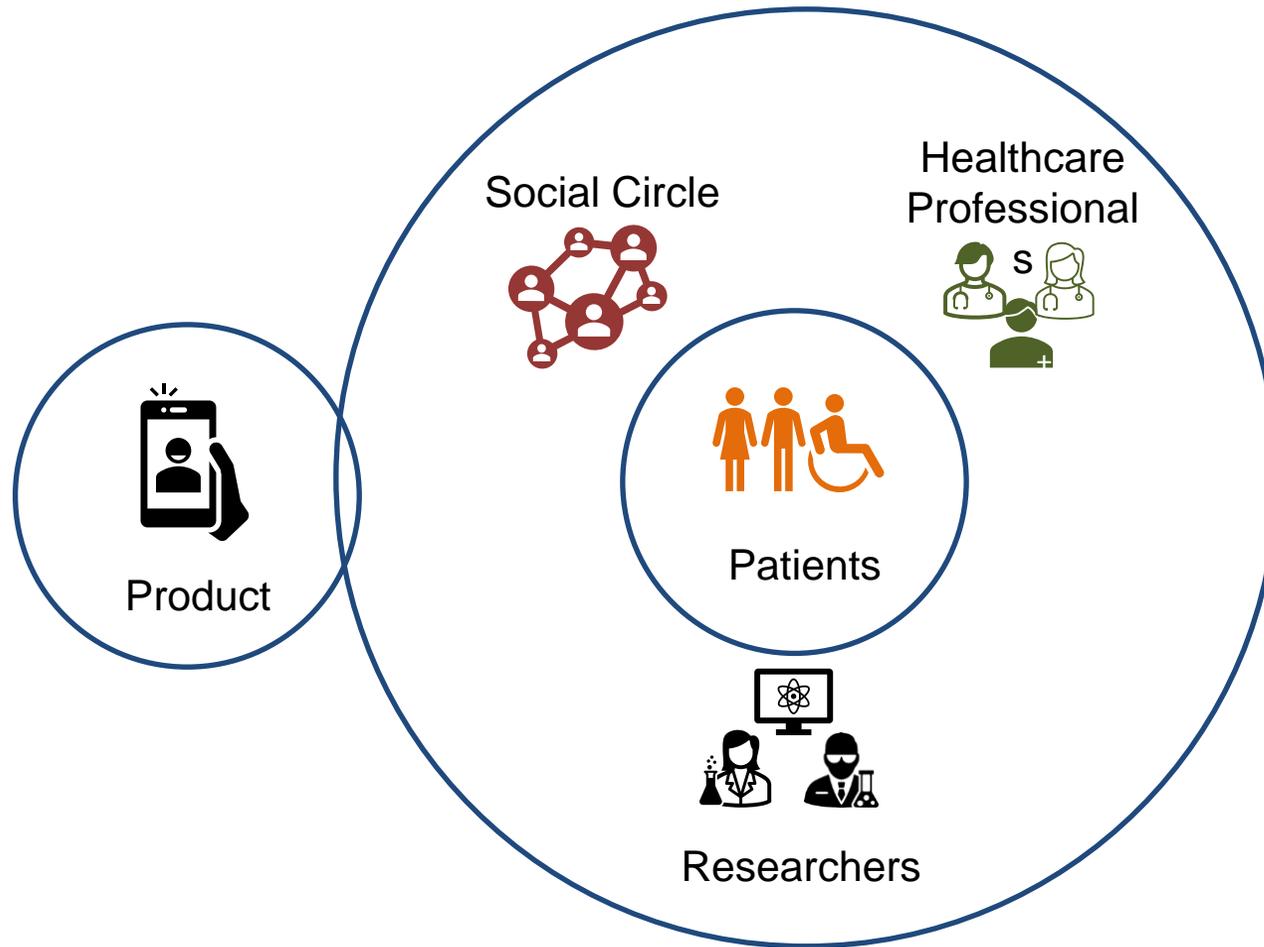
“Patients usually dread physical activity and it’s always hard to convince them that exercising actually helps them.”

“Having an app that would allow patients to visualize their energy levels would be incredibly useful. It would be a great tool to have.”

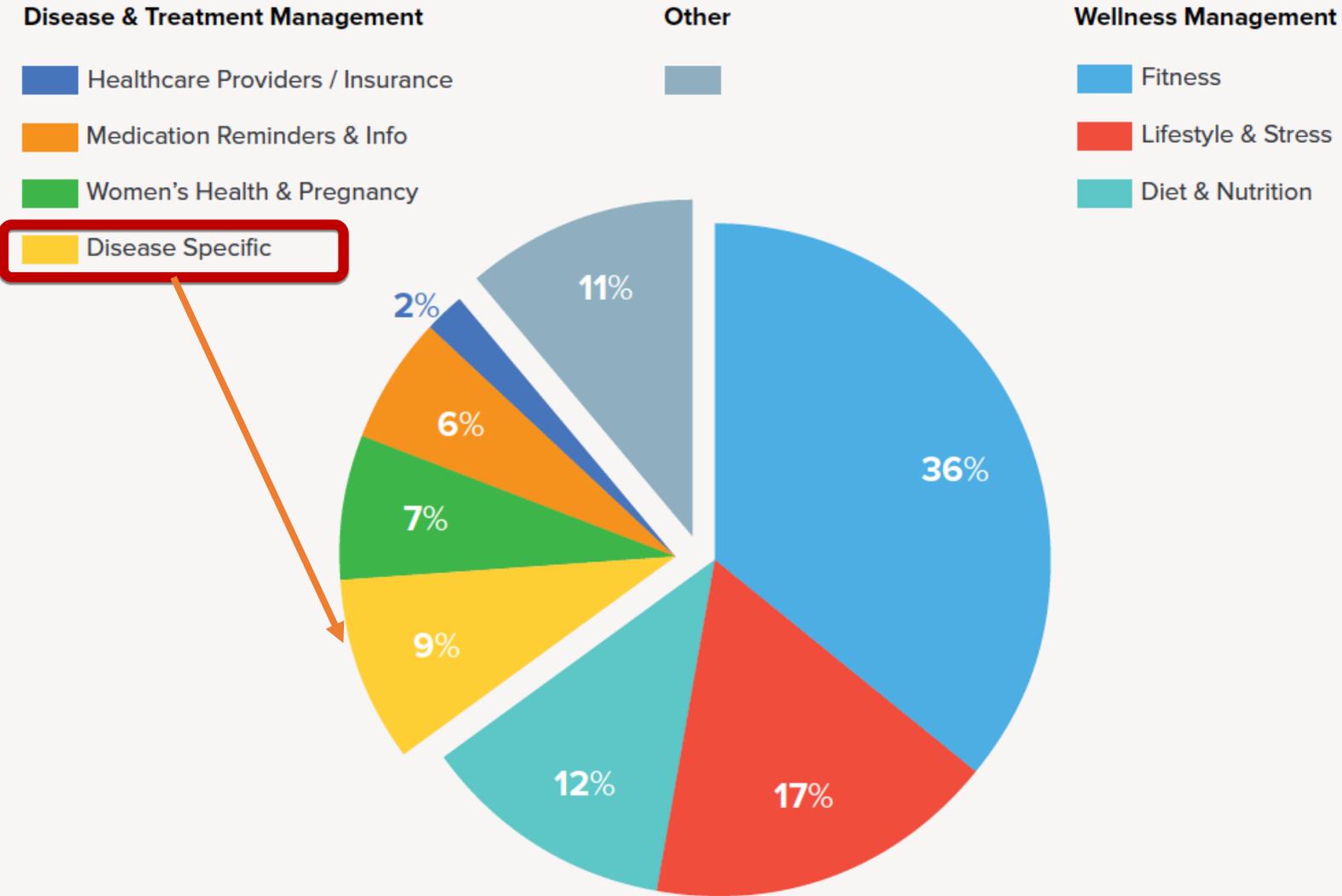
“Setting clear and specific goals is key for these patients. It’s vital finding ways so that these goals become tangible.”



# MORE STAMINA'S JOURNEY



# MOBILE HEALTH APPLICATIONS

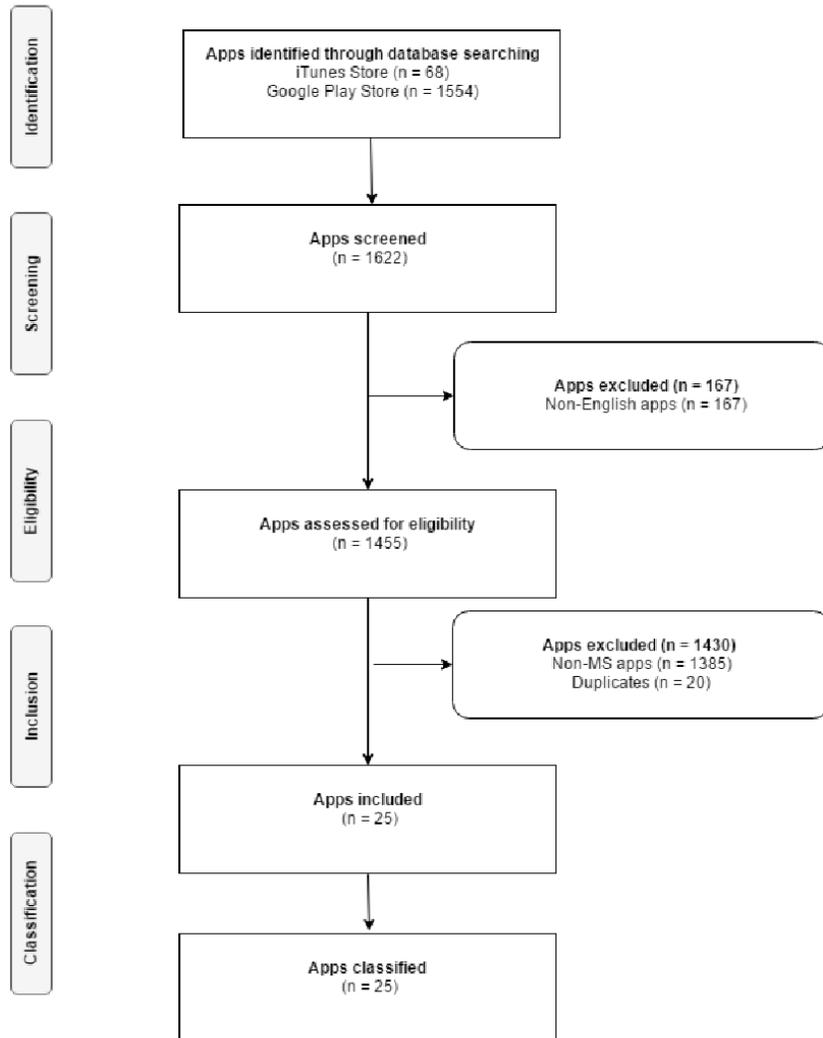


>165,000

Mobile Health Applications



# MULTIPLE SCLEROSIS APPS



- We systematically reviewed all apps in the iOS and Android stores looking for solutions destined for people with MS.

- An initial total of 1,622 apps matched the search terms of “multiple sclerosis”. However, after removing duplicates from each store and manually inspecting them we found only:

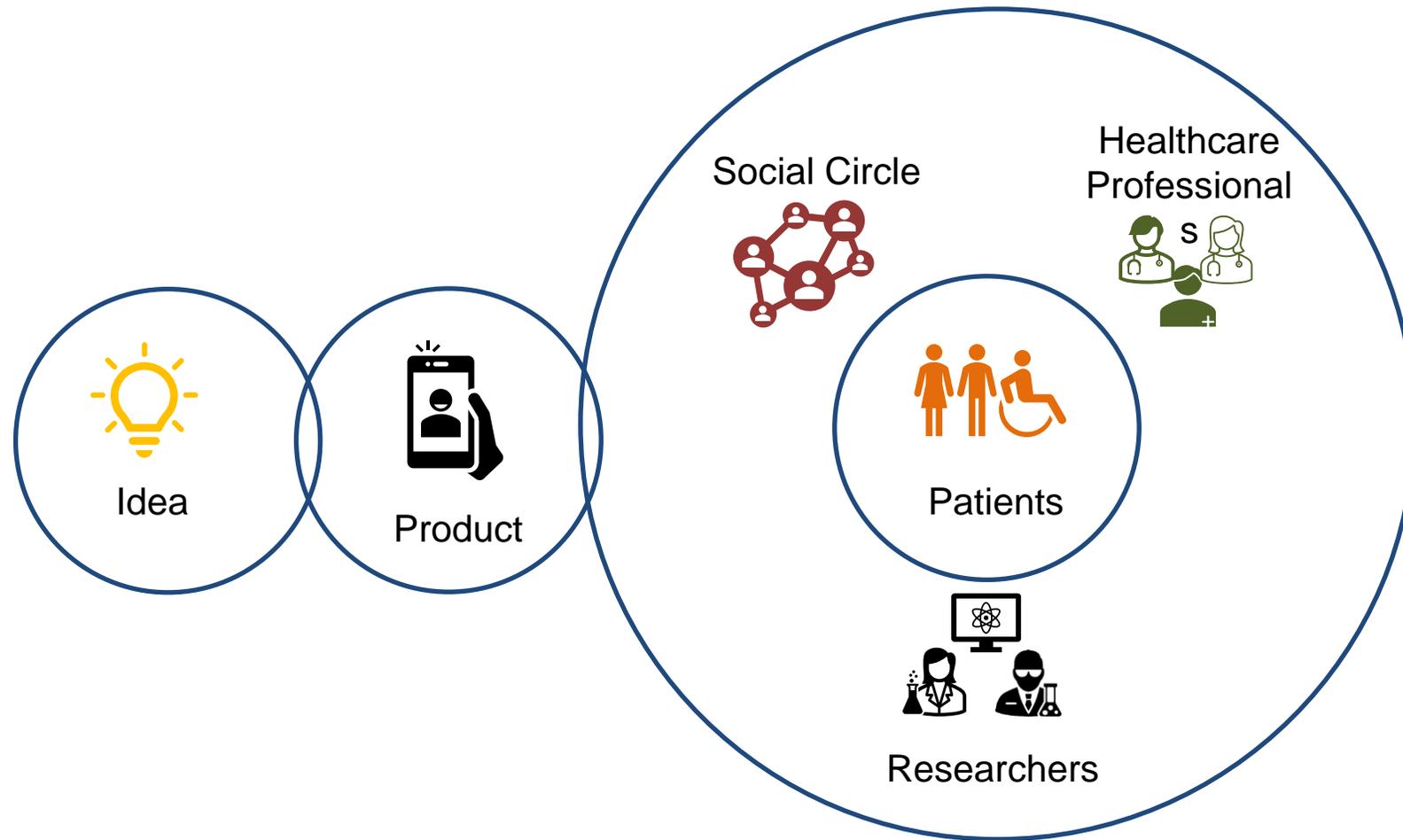
25 apps

for Multiple Sclerosis



Most apps focused only on disease and treatment information

# MORE STAMINA'S JOURNEY

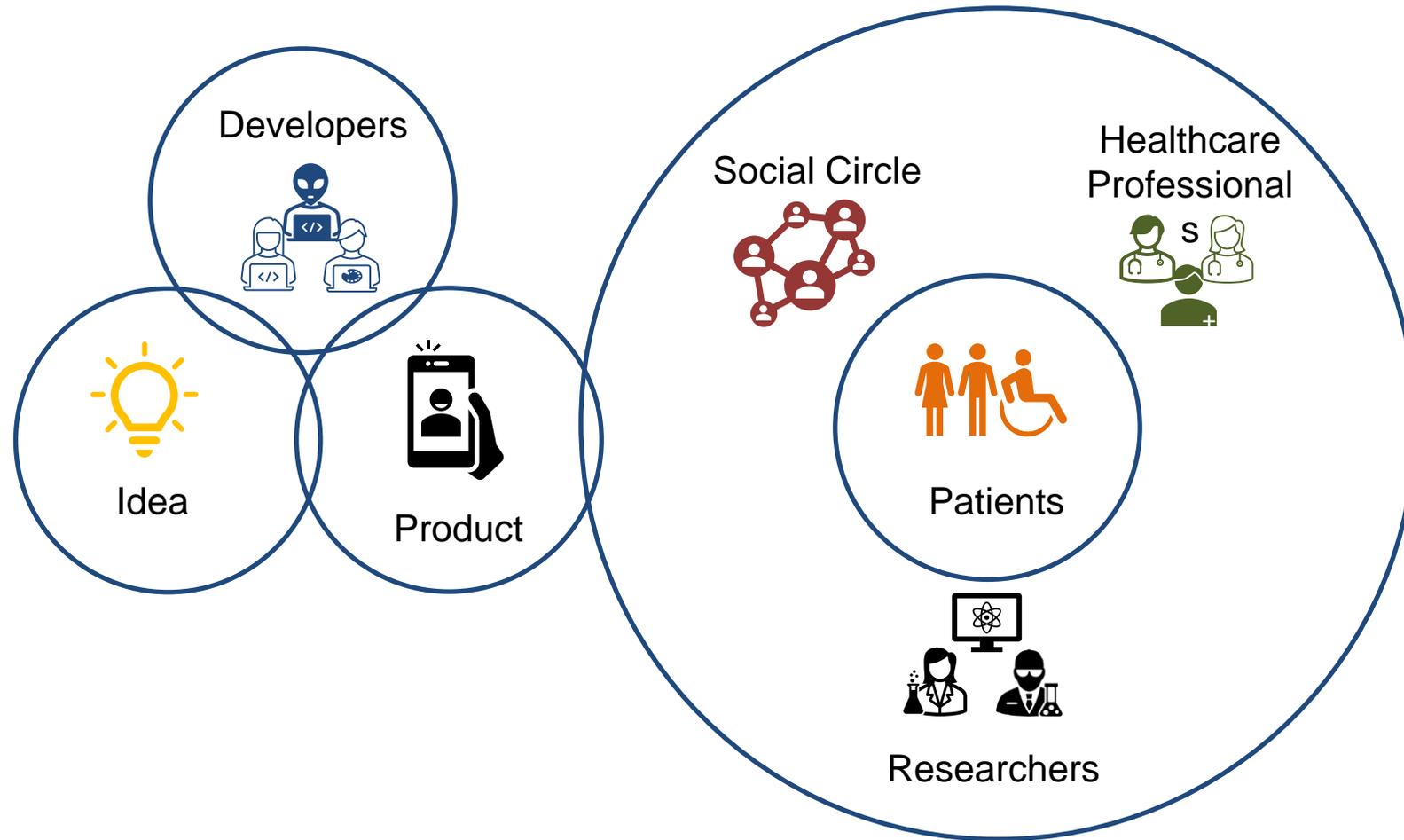


# CO-CREATION WORKSHOPS

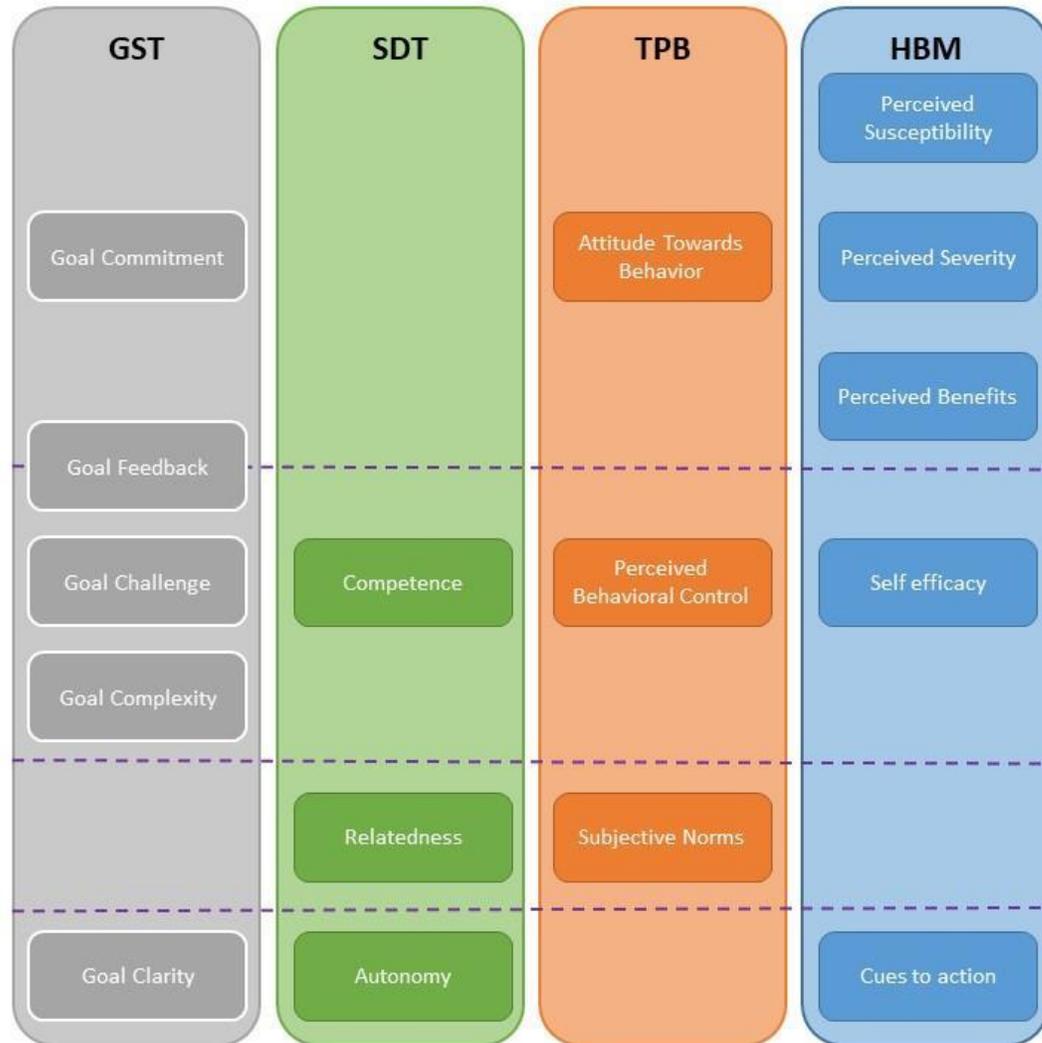
- We hosted a series of co-design workshops to iteratively design concepts that would address MS needs.
- The workshops gathered physicians, nurses, engineers, designers and patient representatives from global conferences like AMIA, MIE, Nursing Informatics and others.



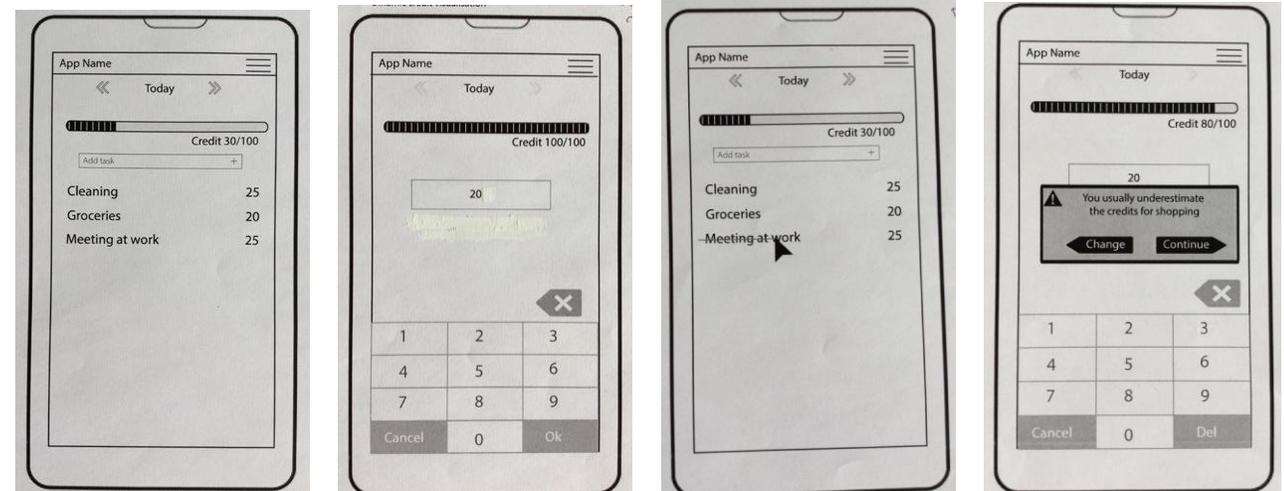
# MORE STAMINA'S JOURNEY



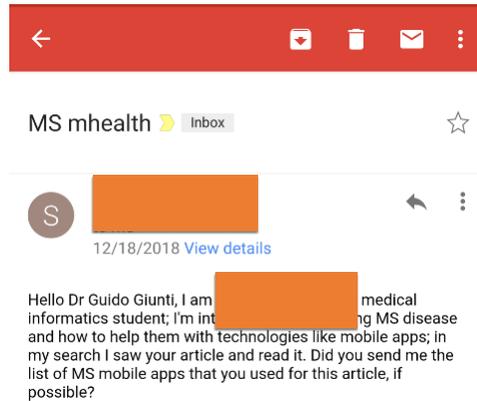
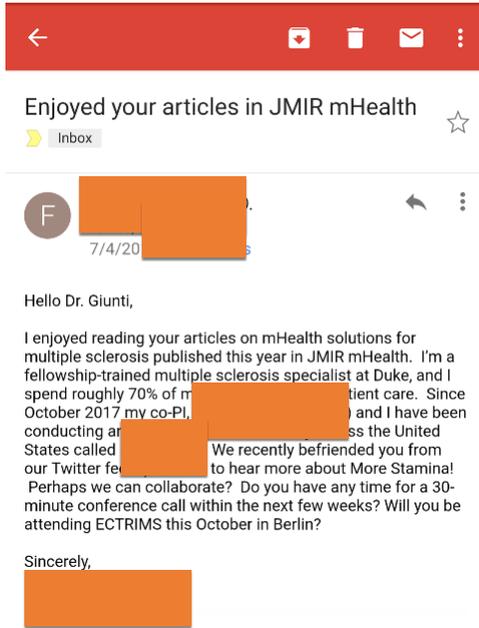
# USER-CENTERED DESIGN



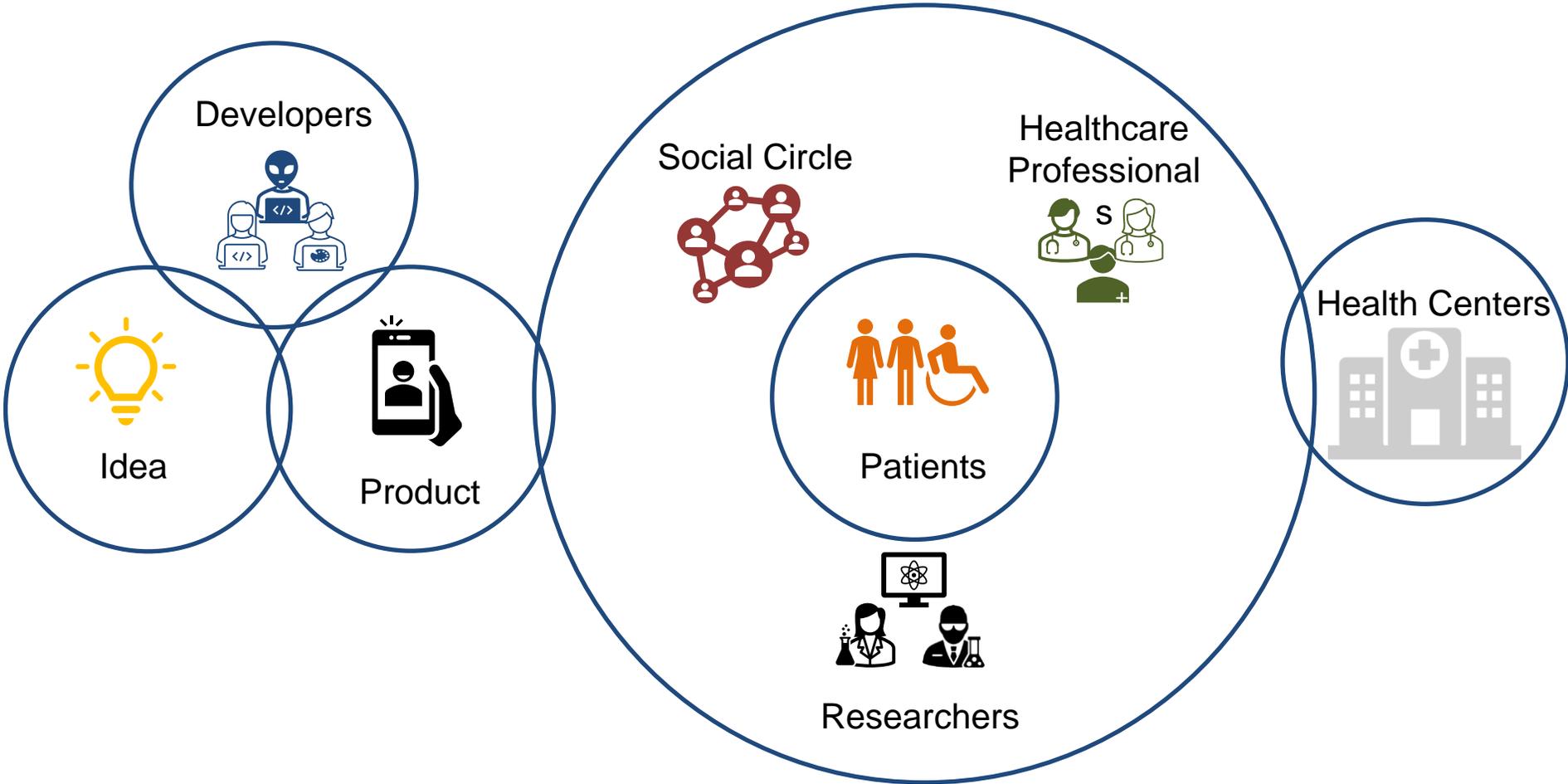
- **User-centered design** was used to iteratively create a mobile solution aimed to help fatigue self-management.
- The steps in the design process were confronted with core concepts of **behavioral change models**.
- When a specific element of behavioral change models was not addressed by a concept, integration was explored or the concept was discarded.



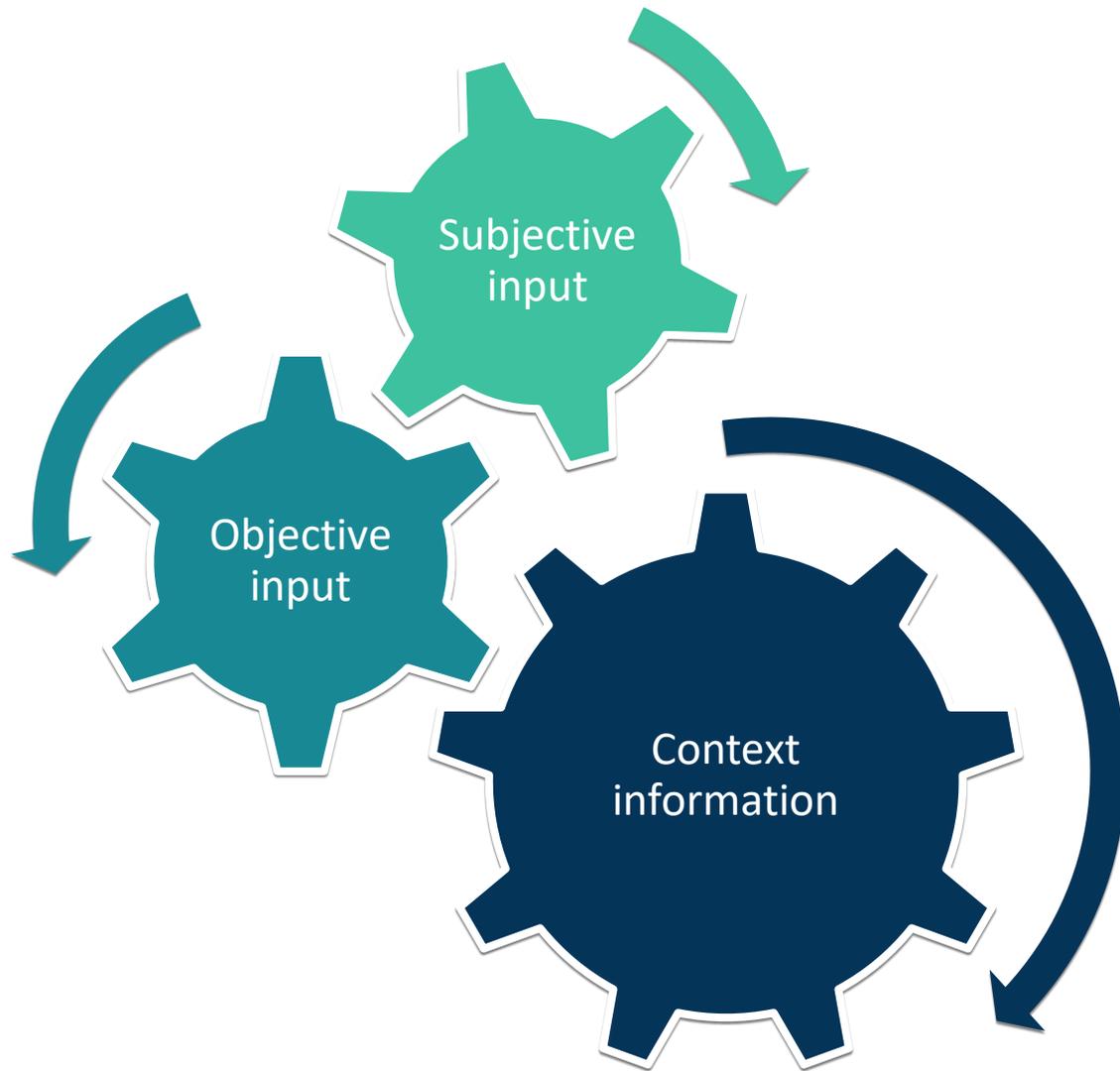
# PROJECT REACTIONS



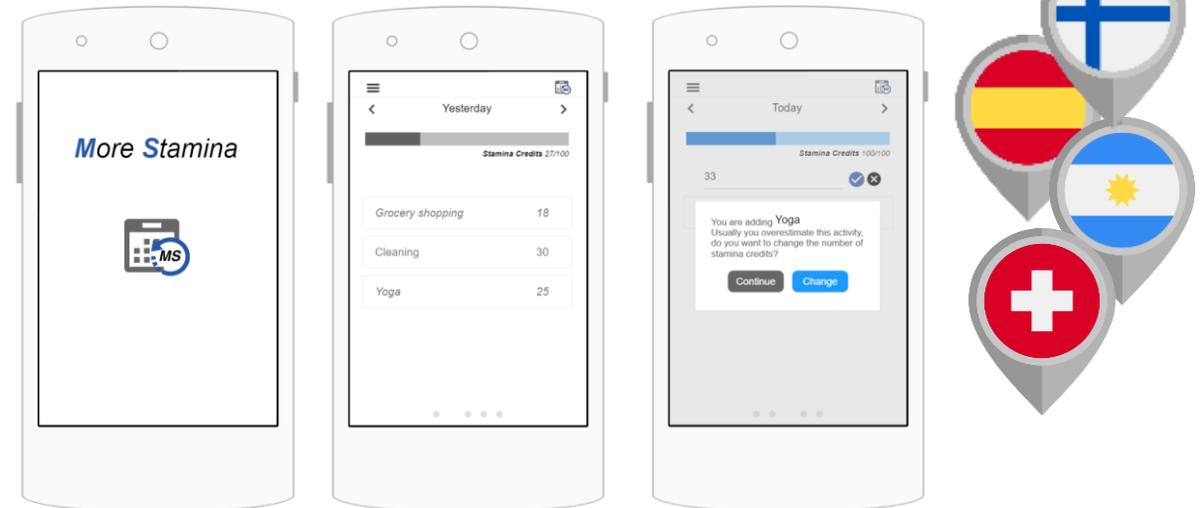
# MORE STAMINA'S JOURNEY



# MORE STAMINA EVALUATION



- A mixed-methods, multicenter study will be used to assess the feasibility, acceptability, and usability of More Stamina.
- The study will take place in 4 locations: Finland, Argentina, Spain, and Switzerland.





## Understanding the needs of people with MS

- **Giunti G**, Kool J, Rivera Romero O, Dorrnoro Zubiete E Exploring the Specific Needs of Persons with Multiple Sclerosis for mHealth Solutions for Physical Activity: Mixed-Methods Study JMIR Mhealth Uhealth 2018;6(2):e37



## Exploring what is commercially available for MS

- **Giunti G**, Guisado-Fernandez E, Caulfield B. Connected Health in Multiple Sclerosis: A Mobile Applications Review. In: 2017 IEEE 30th International Symposium on Computer-Based Medical Systems (CBMS). IEEE; 2017:660-665



## Co-creating potential digital health solutions

- **Giunti G**. Gamified design for health workshop. Stud Health Technol Inform. 2016;225:605-606. doi:10.3233/978-1-61499-658-3-605



## Designing the More Stamina concept

- **Giunti G**, Mylonopoulou V, Rivera Romero O. More Stamina, a Gamified mHealth Solution for Persons with Multiple Sclerosis: Research Through Design. JMIR mHealth uHealth. 2018;6(3):e51



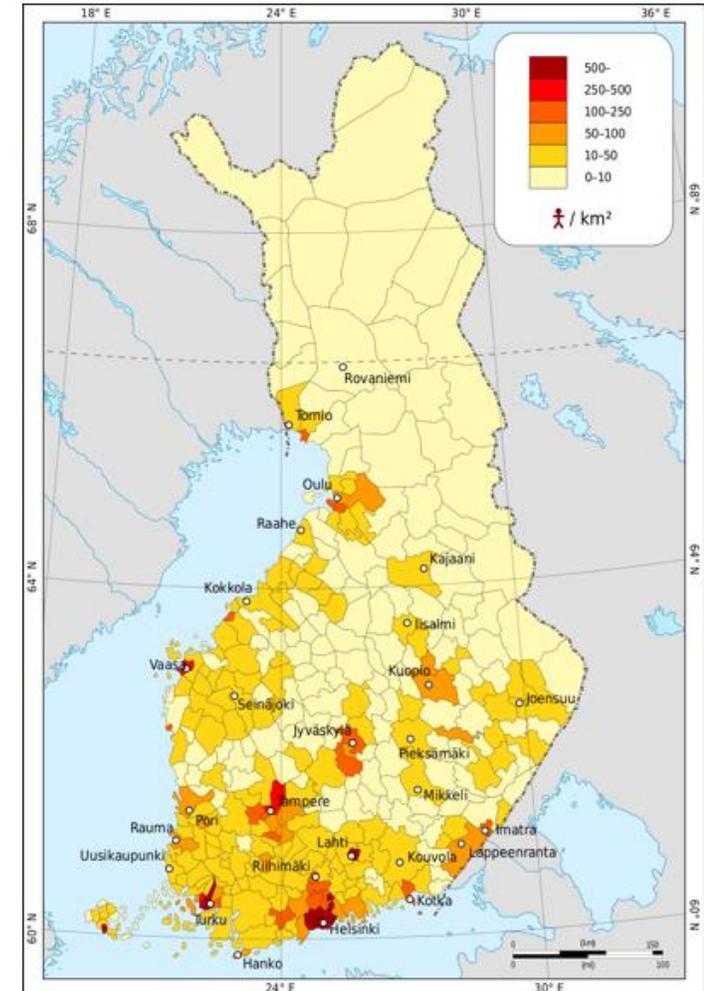
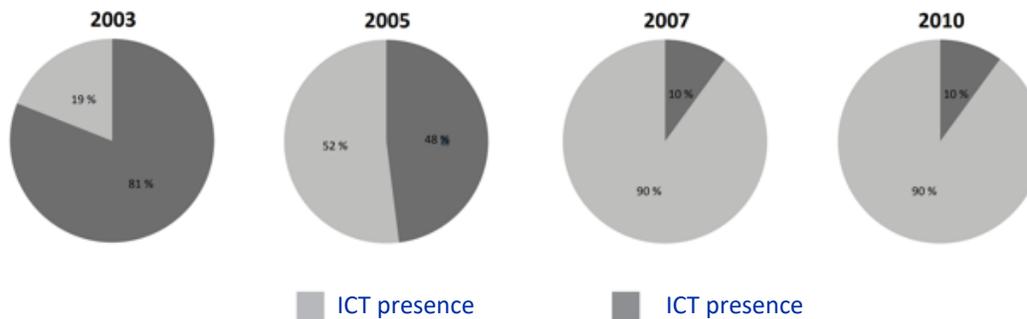
## Testing the prototype with people with MS

- **Giunti G**, et al. Evaluation of More Stamina, a Mobile App for Fatigue Management in Persons with Multiple Sclerosis: Protocol for a Feasibility, Acceptability, and Usability Study, JMIR Res. Protoc. 9 (2020) 1–11.



## ICT DEPLOYMENT OVER TIME

- 1969 – First teleradiology
- 1997 – Focus on EHR
- 2003 – Nation wide EHR started
- 2007 – Nation wide EHR implemented
- 2008 – ePrescriptions started
- 2010 – 100% EHR coverage
- 2017 – 100% ePrescriptions



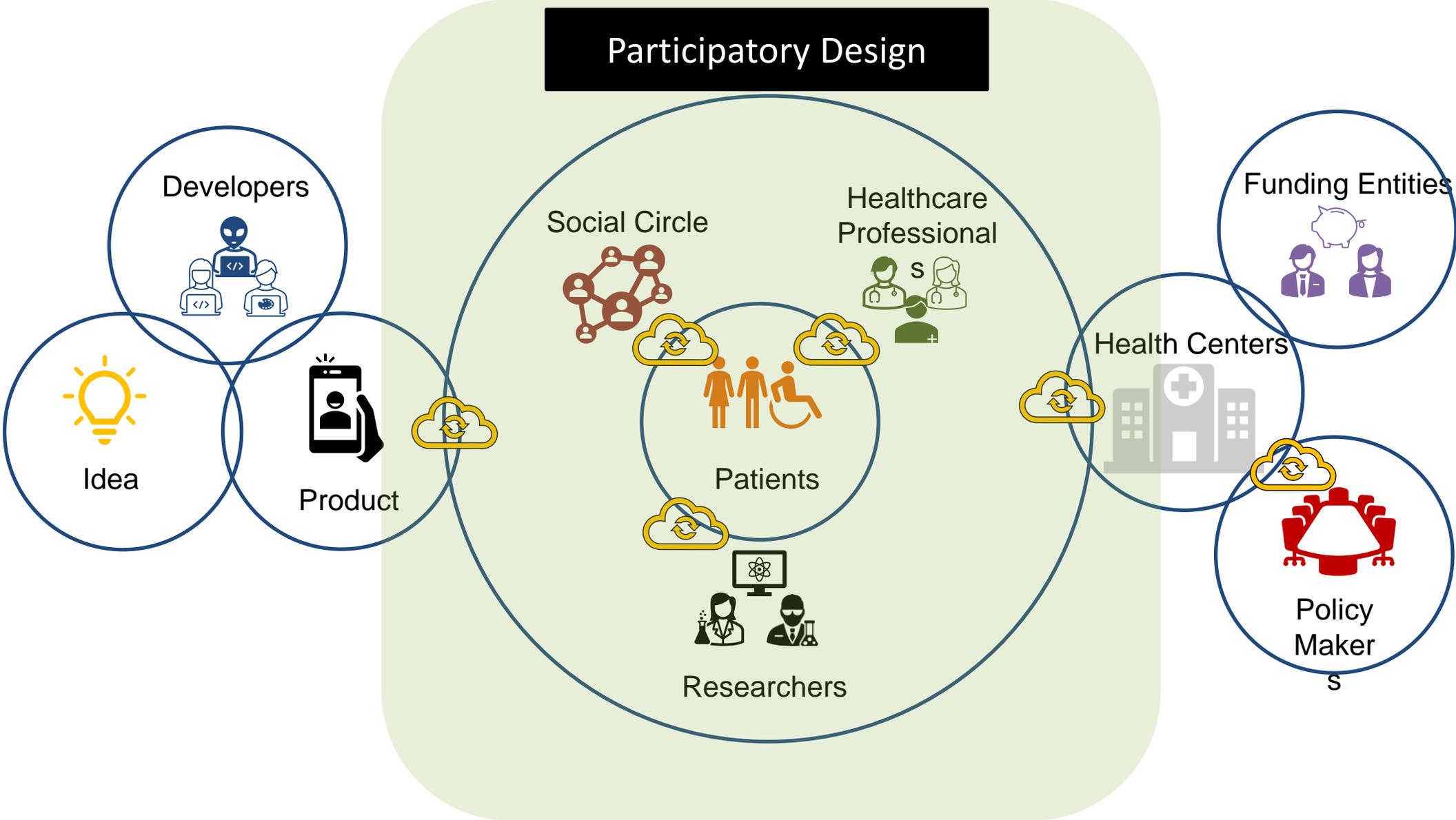
# OULUHEALTH ECOSYSTEM

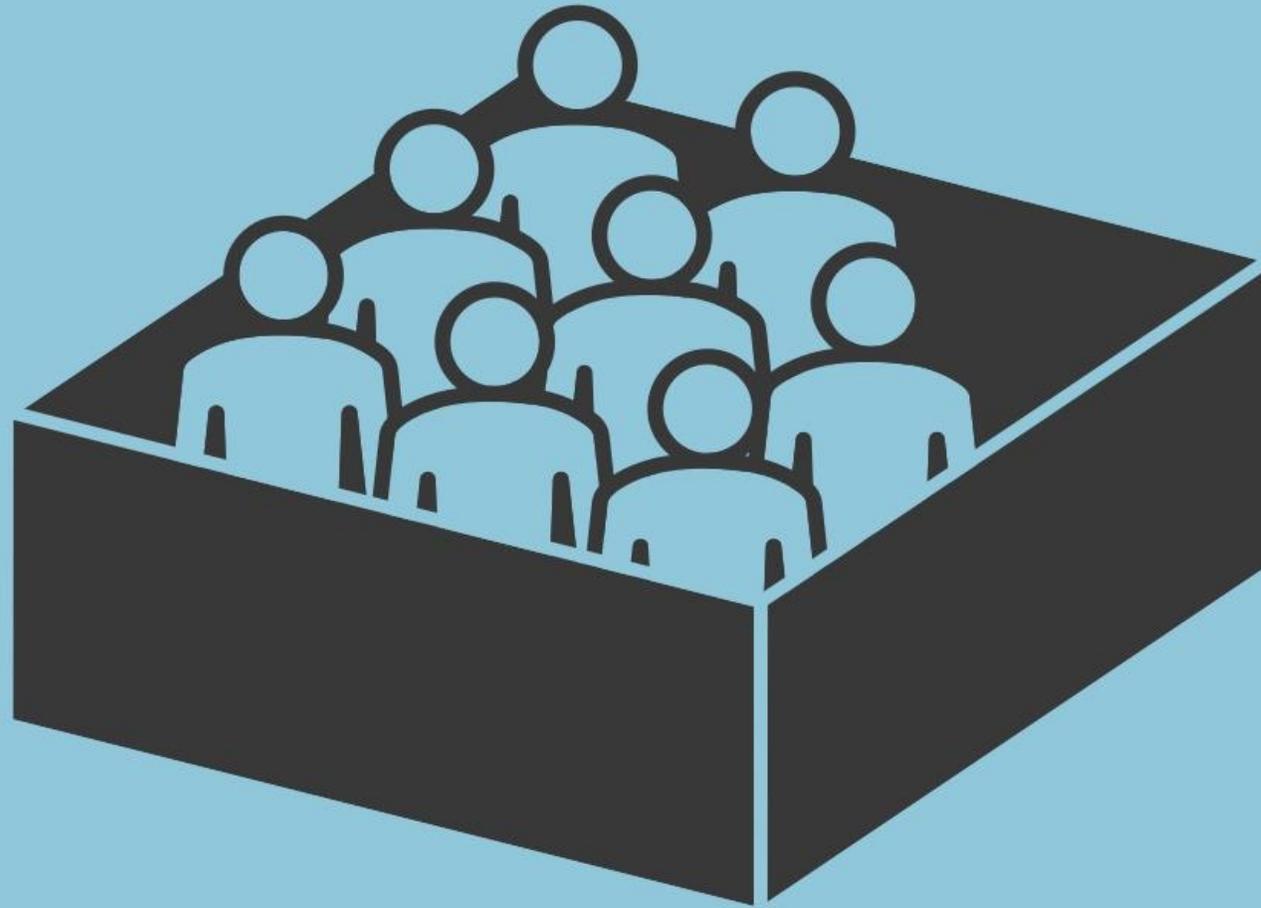
Accelerates the implementation of health innovations, boosts the health-tech business and creates better solutions for the benefit of citizens

- The main stakeholders are **from academia, the public sector, and the private sector**
  - Oulu University Hospital (OYS), University of Oulu, Oulu University of Applied Sciences, VTT Technical Research Centre of Finland, and BusinessOulu and the Department of Healthcare and Social Welfare of the City of Oulu
- Activities are collaborative
  - **business development**
  - **testing and piloting**
  - **research and innovation**
  - **outreaching activities**



# DATA EXCHANGE





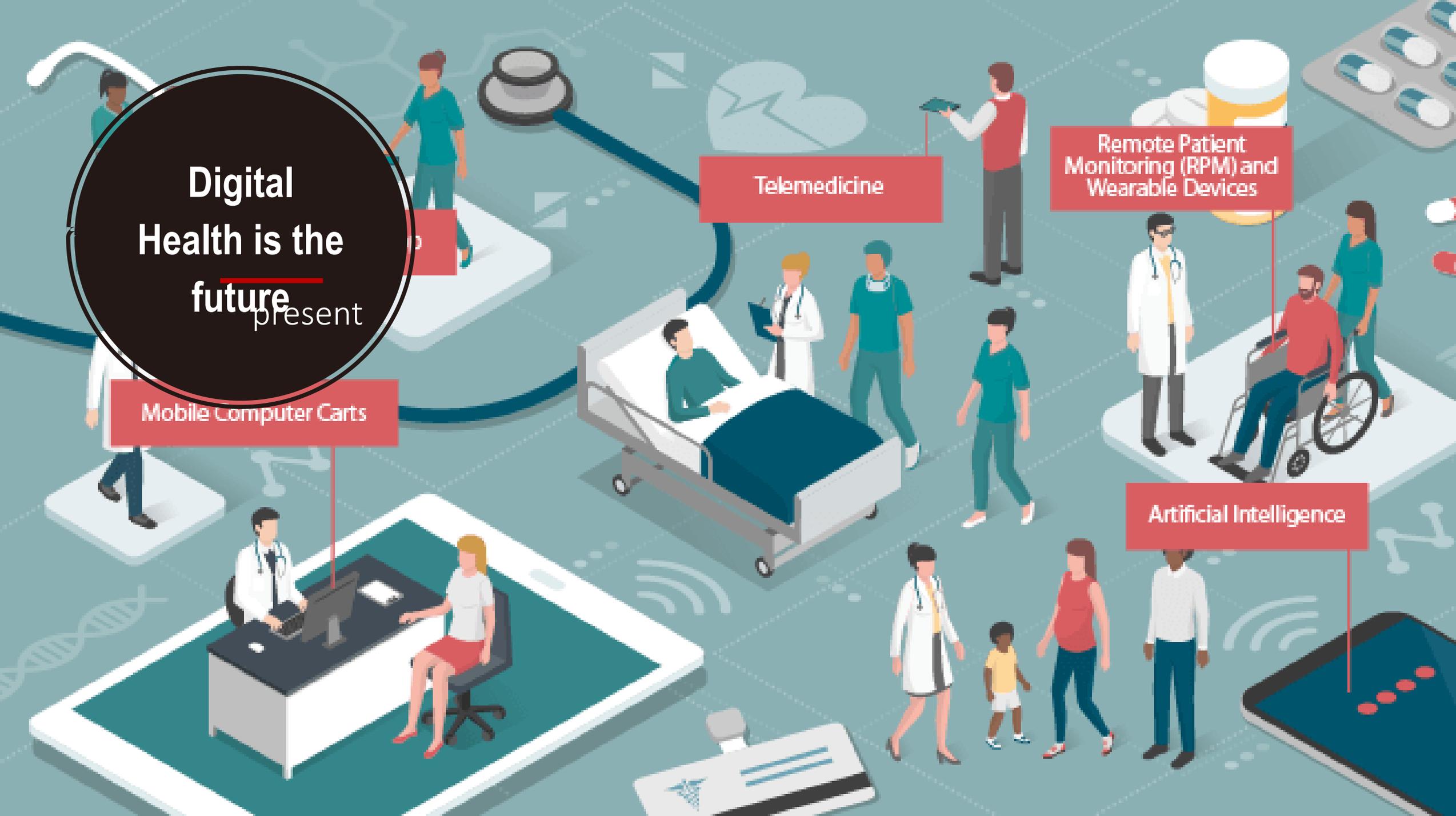
# Digital Health is the future present

Mobile Computer Carts

Telemedicine

Remote Patient Monitoring (RPM) and Wearable Devices

Artificial Intelligence



# THANKS FOR YOUR ATTENTION!

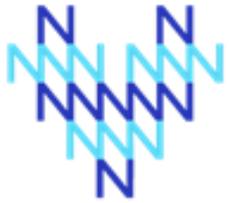


Guido Giunti MD PhD

 [guido.giunti@oulu.fi](mailto:guido.giunti@oulu.fi)

 [buscandoagodot](https://twitter.com/buscandoagodot)

# TIC Salut Social



**mConnecta**  
Solucions de mobilitat  
en salut i benestar

**EHTEL**  
Collaborating for Digital Health and Care in Europe

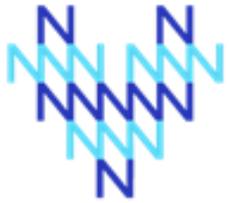
***Integrating data from mobile devices into  
the healthcare processes***

***Yolanda Lupiáñez***

*Digital transformation director*



# TIC Salut Social



**mConnecta**

Solucions de mobilitat  
en salut i benestar

**EHTEL**

Collaborating for Digital Health and Care in Europe

- *Integrating data from mobile devices into the healthcare processes*

- *Yolanda Lupiáñez*
- *Digital transformation director*



**369** Primary Health Centres

**69** Acute Hospitals

**96** Long Term Centres

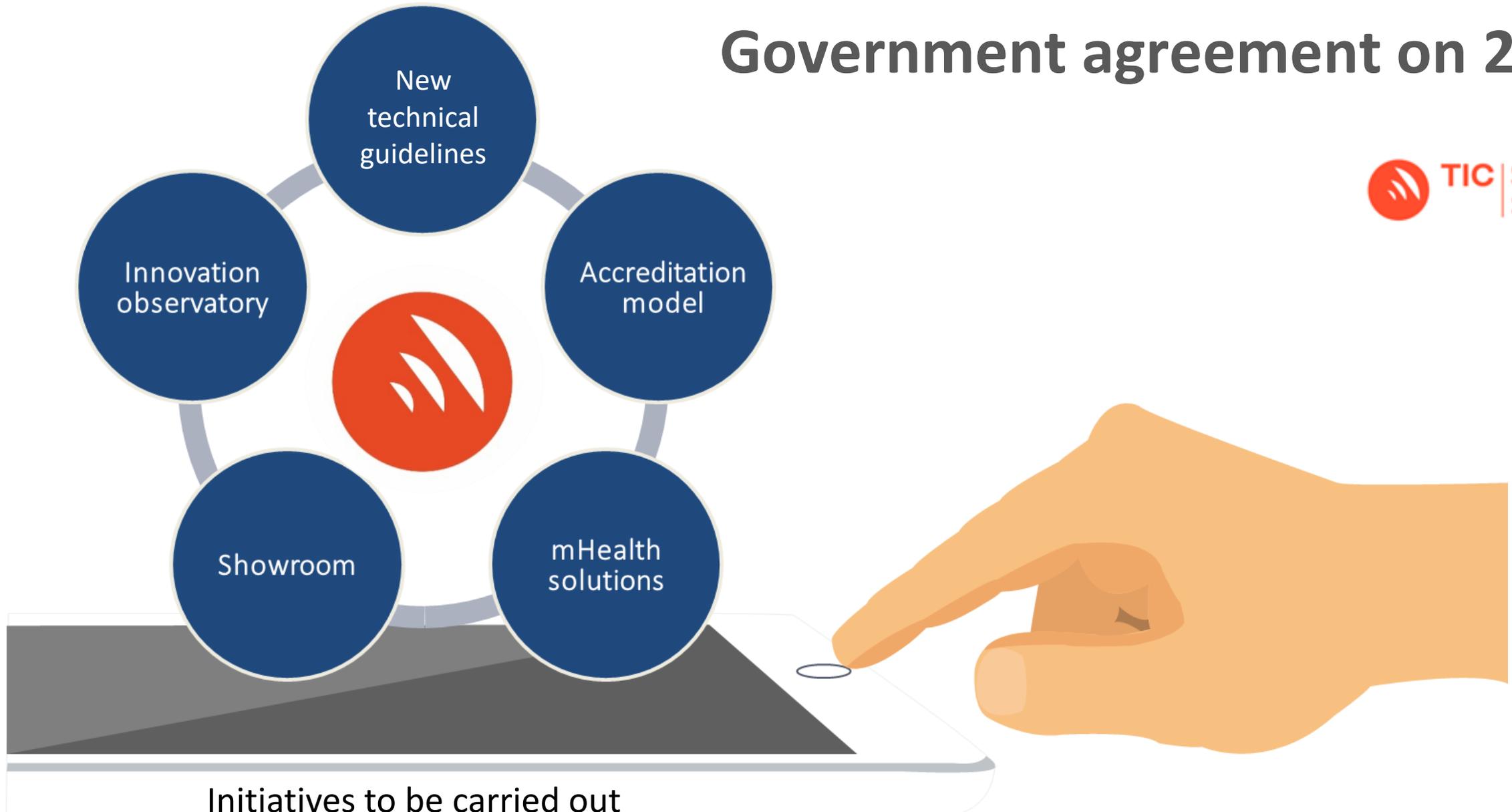
**165** Mental Health Centres

REGION OF CATALONIA

- **Decentralized, multi-provider** model integrated in a single public network.
- Enhances the **autonomous management** of each provider, **free to select** their information systems.
- **Interoperability** among ICT systems must be guaranteed.

- 7.5 M people
- 83 years life expectancy at birth
- 18% of population over 65 (4.3% over 80)

## Government agreement on 2015



Initiatives to be carried out





**NEW PUBLIC  
PROCUREMENT  
PROCESS**

**36** different type of  
medical devices and APPs



**12** providers from **5** different countries

**150K** patients

**Drive a big change in the way we use and share the information both in our processes and across the health system**



**Set up a new relationship model with the industry and lay the foundations for data integration**

# Challenges faced



1. Ensuring APPs **quality** and **reliability**
2. Defining and **agreeing a set of relevant data**
3. Building a **new technological architecture & platform**
4. Creating an **interoperability framework**
5. **Helping industry** to be prepared

## 1. FILL IN ONLINE REQUEST

**Espai per desenvolupadors**

Vols que la teva APP formi part del Marketplace?

Auto-avalua la teva l'APP >    Registra l'APP >

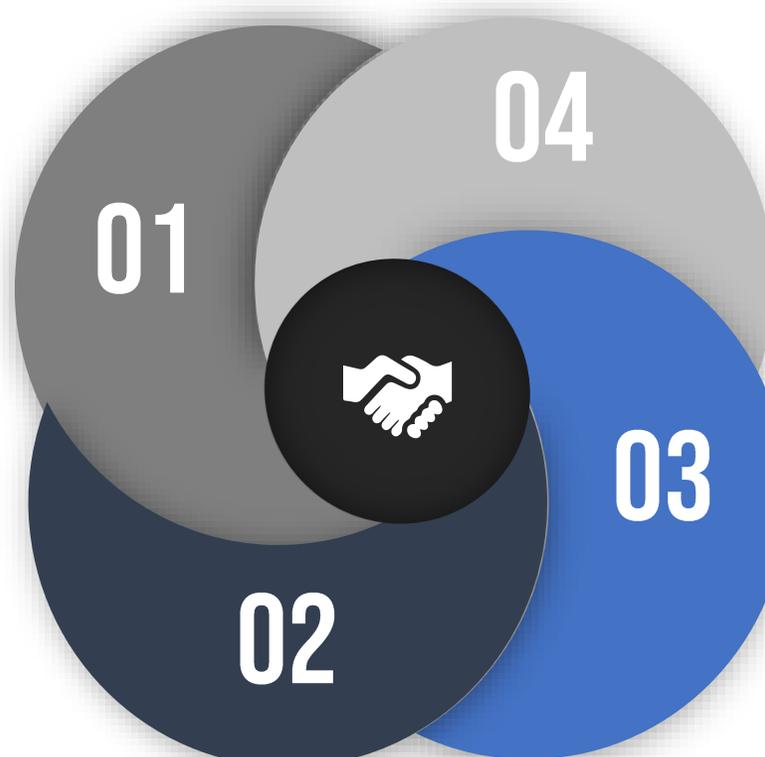
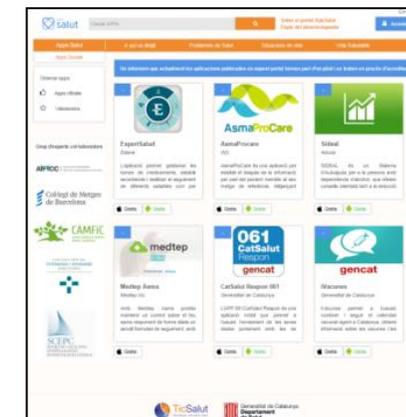
Form fields include: Disseny i usabilitat, Continguts i funcionalitats, Compliment amb els requisits de seguretat, Requisits de tecnologia, Nombre del desenvolupador, Nombre del projecte, Telèfon, Email.

## 2. INITIAL VALIDATION AND CLASSIFICATION



Impacte / risc	1	2	3
< 2%	Certificació nivell I	Certificació nivell II	Certificació nivell III
2% - 10%	Certificació nivell I	Certificació nivell III	Certificació nivell III + auditoria de seguretat
> 10%	Certificació nivell II	Certificació nivell III	Certificació nivell III + auditoria de seguretat + pla de contingència

## 4. APP CERTIFIED



120 evaluation criteria

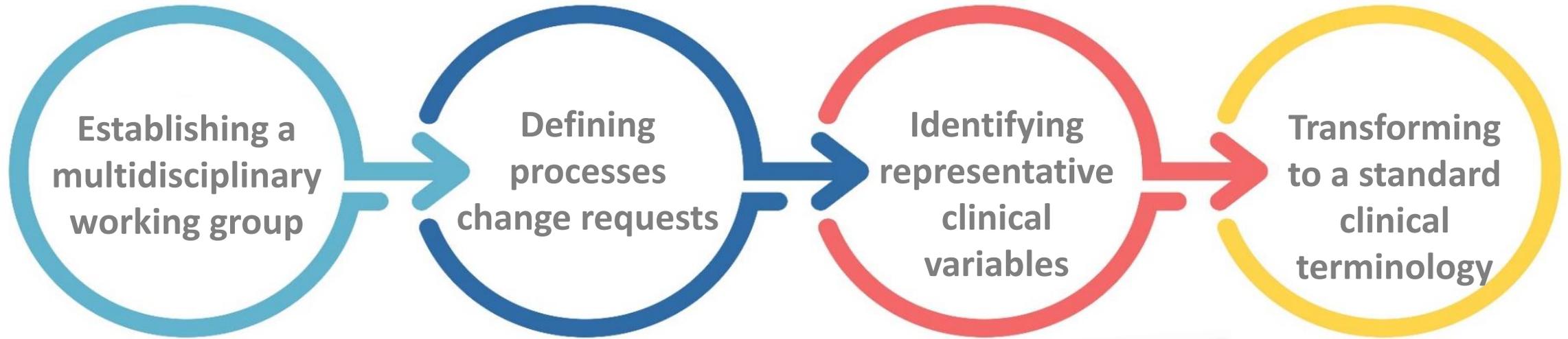
## 3. EXPERTS EVALUATION



Expert usabilitat		Expert mèdic	
Fit	Capçalera	Fit	Capçalera
Garantir que l'APP ofereix una experiència d'usuari amable i funcional.	Perfi funcionalitat amb la conceptualització d'APP i amb els requeriments de disseny i usabilitat actual.	Garantir que l'APP ofereix una experiència mèdica adequada i segura, basada en la evidencia científica i disponible als APP's.	Perfi mèdic: funcionalitat amb la qualitat de vida i seguretat clínica al utilitzar els continguts mèdics.
Expert legal		Expert tècnic	
Fit	Capçalera	Fit	Capçalera
Garantir que l'APP s'adhereix als requisits de privacitat i de seguretat de dades.	Perfi funcionalitat amb la conceptualització d'APP i amb els requeriments de disseny i usabilitat actual.	Garantir l'eficiència i fiabilitat de l'APP i assegurar la interoperabilitat amb altres sistemes.	Perfi tècnic: funcionalitat amb el rendiment i la seguretat, manteniment, actualitzacions, etc.
Expert temàtic			
Perfi especialitzat en un determinat àmbit temàtic i funcionalitat amb l'univers de les aplicacions mòbils. L'objectiu de complir amb aquest fitxa entesa en que pugui aportar valor, sense haver-hi cap cost d'ús en aquest procés d'avaluació (la conceptualització d'APP, els requisits de disseny i usabilitat, els requisits de disseny i usabilitat, etc.).			

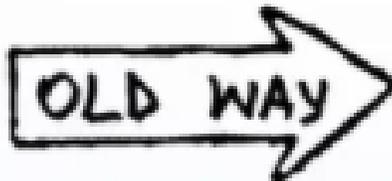
- I. Design and usability
- II. Content and functionality
- III. Privacy and security
- IV. Technological requirements

# 2. Defining and agreeing a set of relevant data

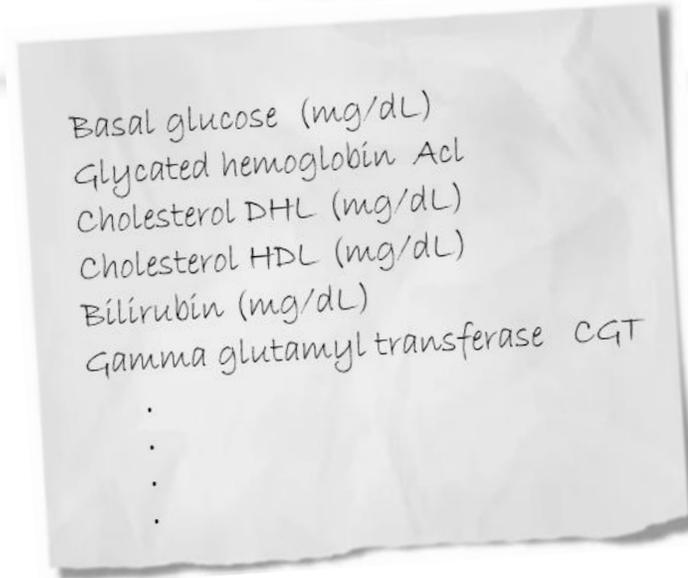


Primary care  
Specialized care  
Endocrinologists  
Paediatricians  
...

1 time x month



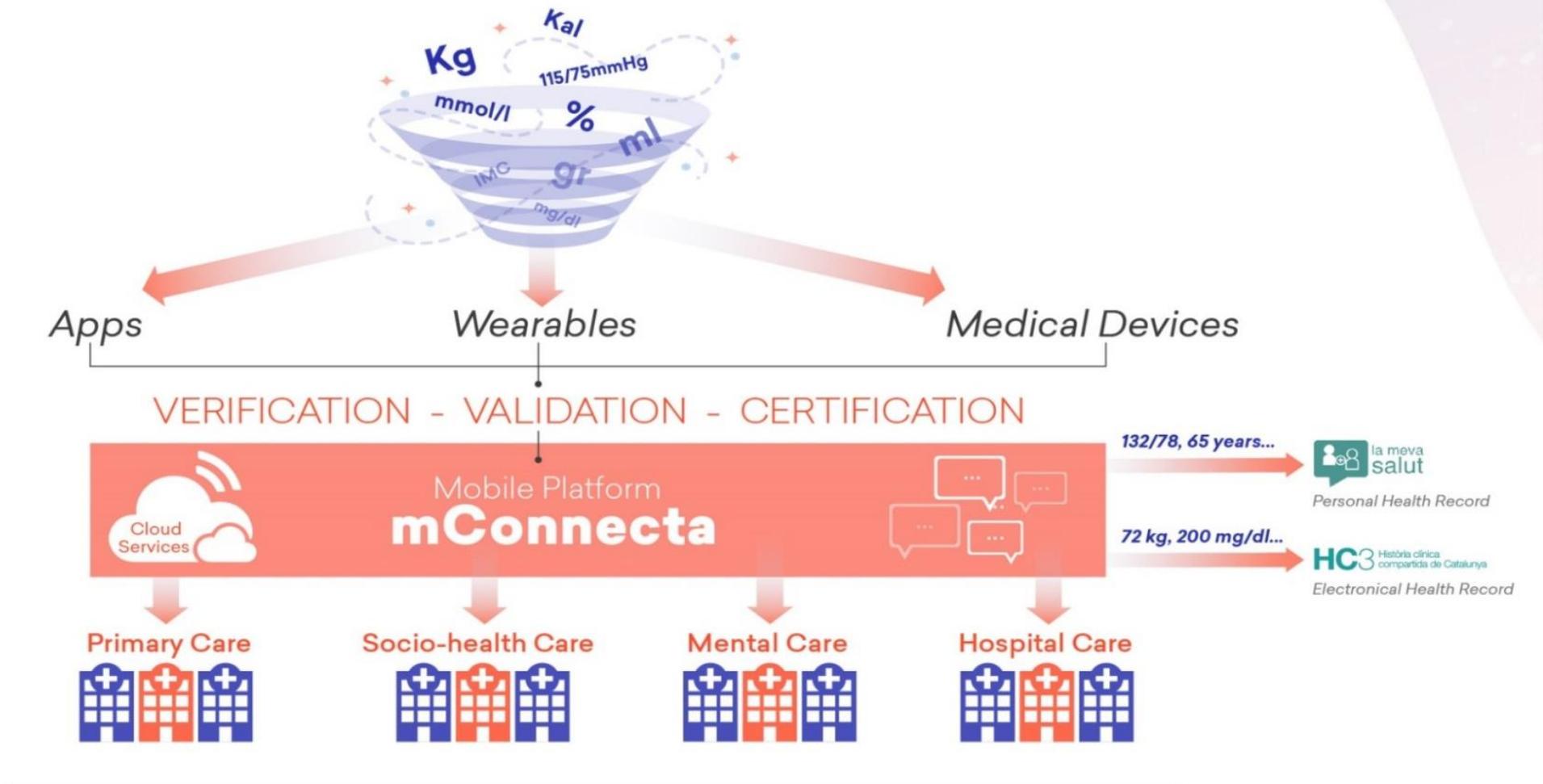
1 time x minute →  
**ALARMS**



**SNOMED CT**  
The global language of healthcare

# 3. Building a new technological architecture & platform

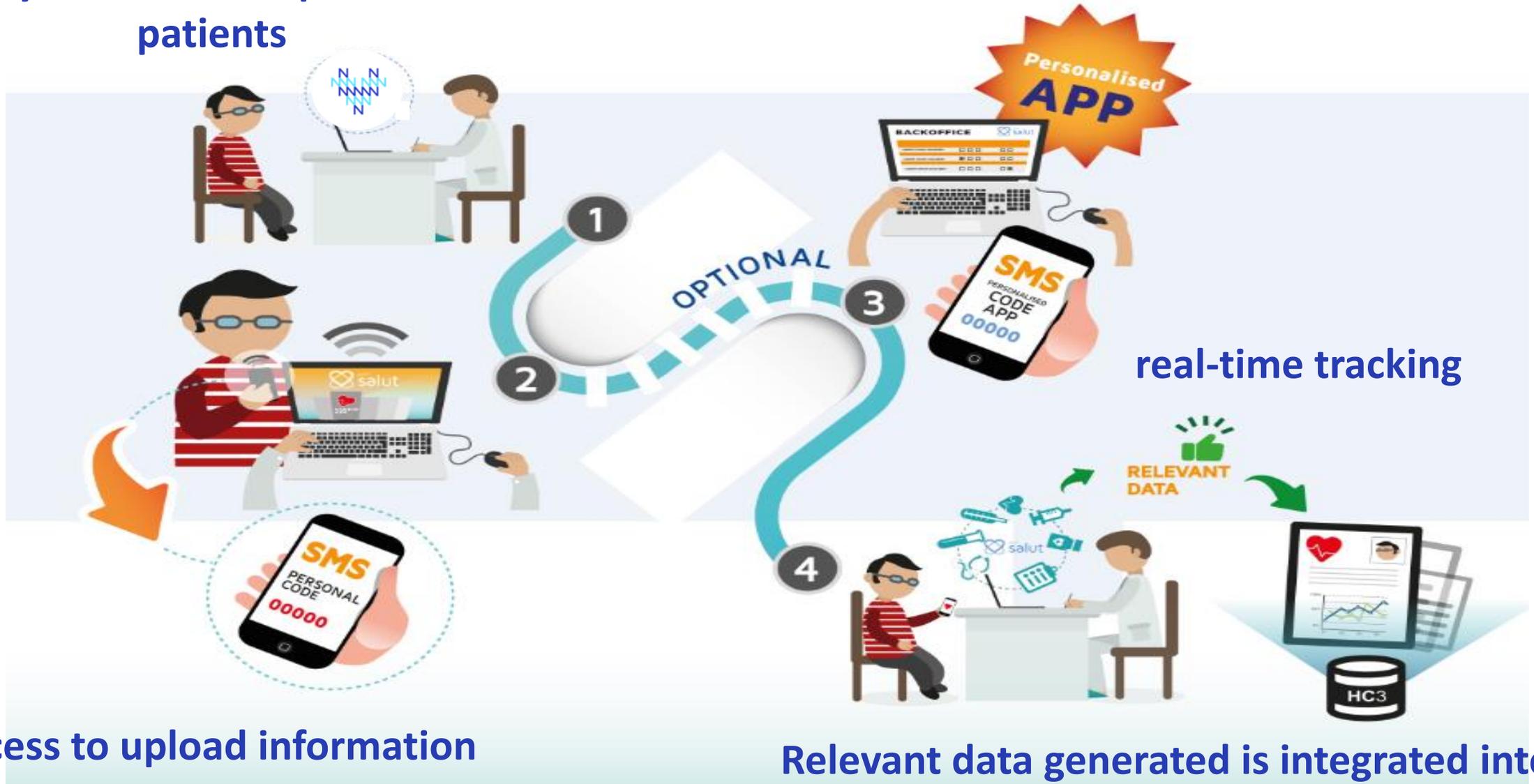
Interoperability



Service operability 365/24/7

# 3. Building a new technological architecture & platform

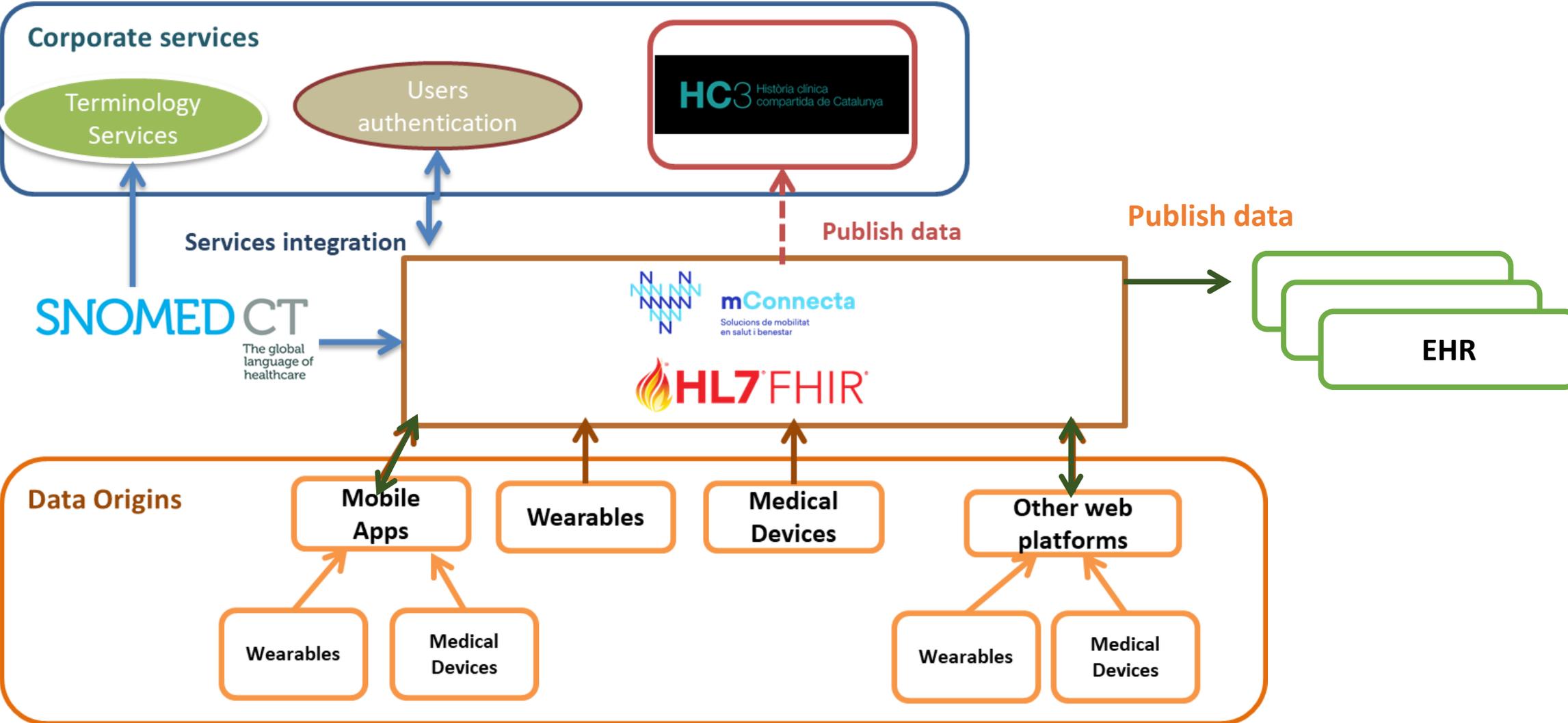
Mobility elements are prescribed to patients



Access to upload information

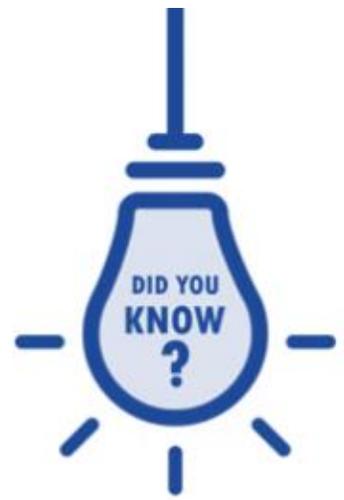
Relevant data generated is integrated into patient's health record

# 4. Creating an interoperability framework



# 5. Helping industry to be prepared

... by providing them information, tools and support:






**Guia del Banc de Proves de mConnecta per a dispositius de seguiment de la glucèmia**

Pàgina per crear el vostre missatge HL7 FHIR en X...

Introduïu les dades que us ha facilitat l'Oficina Tècnica mConnecta en els espais corresponents. I feu clic a "GENERAR XML" per crear el vostre missatge amb els valors introduïts. Un cop realitzada aquesta acció us apareixerà el missatge generat a la part inferior de la pàgina. Tots els missatges enviats al Banc de Proves mConnecta, que no hagin rebut el correu electrònic d'adhesió, no seran validats.

**Id Registre:** 71627819XX

**Id Provedor de l'Element:** 123456789

**Id Element de Mobilitat:** 123456789

**DNI:** 33000000H

**Telèfon mòbil:** 000000000

**PIN:** SC819DALP

**Data i hora mesura:** AAAA-MM-DDThh:mm:ss.sss+02:00

**GENERAR XML**

Aquí heu de recopilar el vostre XML amb les dades introduïdes

Inici Generar Contacte



**AIPD - QUADRE DE COMANDAMENT**

ACRÒNIM DEL PROJECTE: DEACI | TÍTOL DEL PROJECTE: Medicina personalitzada per a desenvolupar nous tractaments i intervencions per a combatre malalties del fetge

0. Anàlisi de la Necessitat de fer l'AIPD

1. Descripció del Tractament

2. Necessitat i Proporcionalitat

3. Controls per Garantir els Drets de les Persones

4A. Riscos per Incompliment de Principis i Drets

4B. Riscos en la Seguretat de les Dades

**100%**

Secció completa

**CAL AIPD**

**81%**

Falta completar (9/48)

Cal revisar alertes:

- 0 alertes (vermell)
- 5 avisos (ambre)

**100%**

Secció completa

Cal revisar alertes:

- 0 alertes (vermell)
- 9 avisos (ambre)

**61%**

Falta completar (16/41)

Cal revisar alertes:

- 0 alertes (vermell)
- 1 avisos (ambre)

**100%**

Secció completa

S'han inclòs tots els avisos i alertes per valoració

RISC INHERENT: RISC ALT  
RISC RESIDUAL: RISC MITJÀ

**80%**

Falta completar (9/46)

RISC INICIAL: RISC MITJÀ

Accions rellevants no planificades o esperades: 2

RISC RESIDUAL: RISC BAIX

Control de Versions

Documentació Annexada

Pla d'Implantació - Controls de Seguretat

RESUM AIPD

VALORACIÓ

**100%**

Secció completa

**100%**

Secció completa

- Cal revisar si s'ha annexat la documentació rellevant
- Sense alertes de dates previstes en el passat

ACCIONS PROPOSADES per avisos		ACCIONS PLANIFICADES		ACCIONS NO PLANIFICADES D'ESPERADES	
SI - MOLT ALTA	SI - ALTA	Rebutjada	Pendent	Accions Rebutjades Crítiques	Accions Rebutjades Rellevants
0	0	1	2	0	0
49	3	0	0	0	0
7	11	0	0	2	2
ND	38	0	33	0	0
<b>TOTAL</b>	<b>56</b>	<b>TOTAL</b>	<b>49</b>	<b>TOTAL</b>	<b>2</b>

**50%**

Falta completar (6/12)

Valoració global:

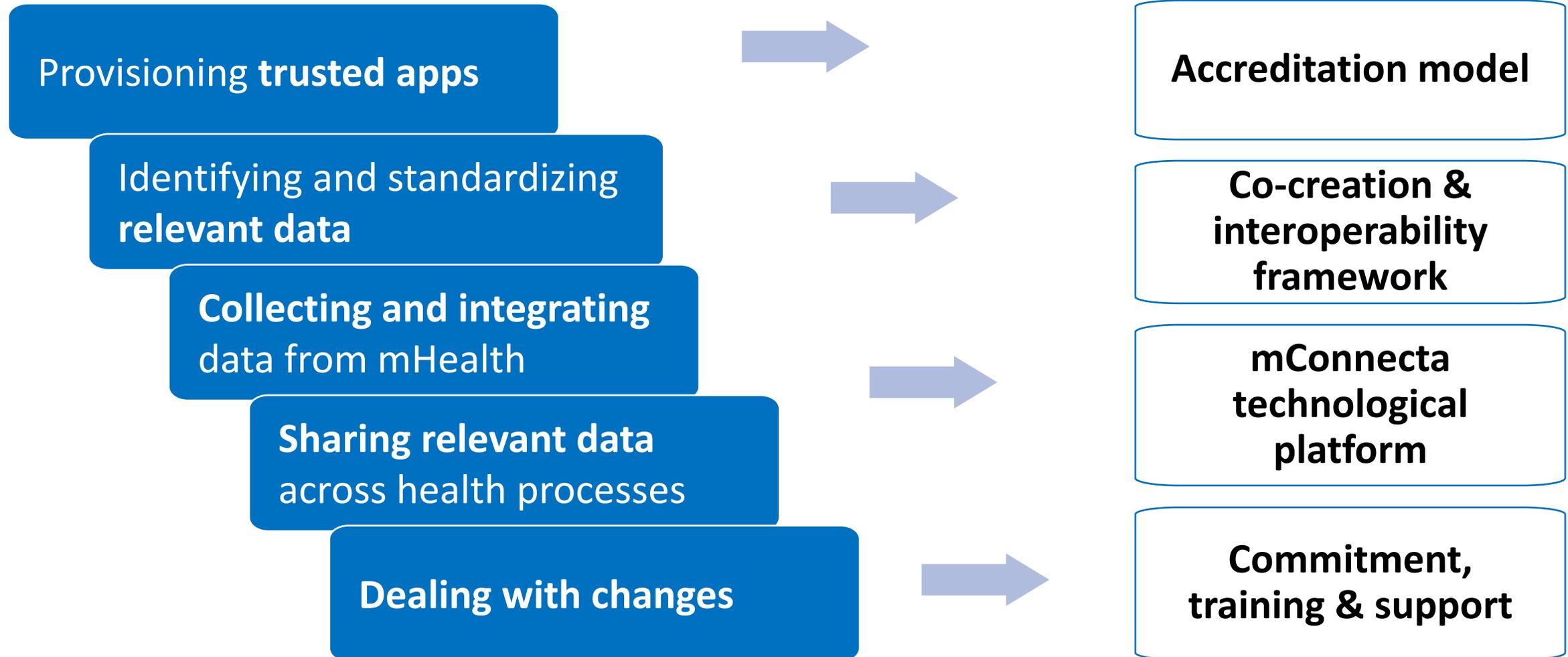
**PENDENT DE VALORACIÓ**

<https://ticsalutsocial.cat/actualitat/mconnecta-obre-el-banc-de-proves-per-lassaig-dintegracio-de-solucions-per-diabetis/>

How to codify, develop and test the FHIR interoperability messages

<https://ticsalutsocial.cat/dpd-salut/avaluacio-dimacte-relativa-a-la-proteccio-de-dades-aipd-en-salut/>

How to analyse GDPR impact on the ICT provided solutions



# Thank you!



**Yolanda Lupiáñez**

 [ylupianez@ticsalutsocial.cat](mailto:ylupianez@ticsalutsocial.cat)

 [@YolandaLupianez](https://twitter.com/YolandaLupianez)

 [@ticsalutsocial](https://www.instagram.com/ticsalutsocial)  [@ticsalut](https://twitter.com/ticsalut)

 **TIC | Salut Social**

 **Generalitat de Catalunya**

# Discussion

## Front row

- **Eirik Årsand** – Researcher, Norwegian Centre for E-health Research (Norway)
- **Heather Cook** – Associate Director of Partnerships, ORCHA (United Kingdom)
- **Javier Ferrero and Belen Sotillos** – Project coordinators, European mHealth Hub (Andalusian Ministry of Health, Spain)
- **Markus Kalliola** – Project director Health data 2030, SITRA (Finland)

# Key messages

# Key messages

- **Societal value** is now a must-have for any successful digital solution.
- Interoperability and liberated data are also now becoming more and more an essential **ethical** issue (and key to business models).
- Co-creation must happen **from start**, involving all actors, continuously and along the entire value chain.
- The “**use case**” approach to understand and validate the needs, federate the community, co-create and create a common health data space remains a very rich approach.

## Next sessions

- ▶ **Hybrid care: Mainstreaming virtual care with new models of care**

20 May 2021

- ▶ **Building the data-driven hospital and facing the challenges: from EHRs to data ecosystems**

June 2021

**Thank you for your participation**

The logo for EHTTEL, featuring the letters 'EHTTEL' in a bold, sans-serif font. The 'E' and 'H' are dark blue, while the 'T', 'E', and 'L' are a lighter blue. The letters are slightly overlapping and have a subtle shadow effect.

**EHTTEL**

Collaborating for Digital Health and Care in Europe