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DEVELOPING AI CAPABILITIES AT HELSINKI UNIVERSITY HOSPITAL

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ACADEMIC MEDICAL CENTER HELSINKI CAMPUS

HUS⁺



FIMM
Finnish Institute of Health Economics
Finnish Institute of Health Economics



TERKKO
HEALTH
HUB



HEALTH
CAPITAL
HELSINKI

FORUM
VIRIUM
HELSINKI

HEALTHVILLAGE.FI

HUS OPERATES IN 23 SITES



Southern Finland special catchment area for tertiary care together with districts of Southern-Karelia (**Eksote**), Kymenlaakso (**Carea**) and Päijät-Häme (**PHHYKY**)



Healthcare in 2019

2,900,000 PATIENT VISITS

92,000
surgeries

453

organ transplants

16,000
childbirths

24.5 million

laboratory tests

1.8 million

imaging examinations

680,000
PATIENTS
TREATED

860,000
treatment
days

330,000

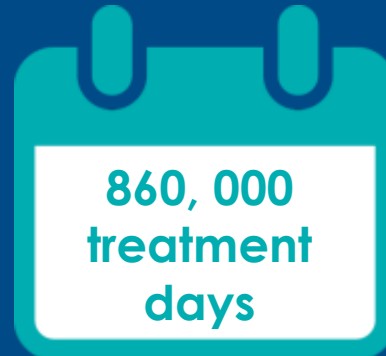
elective referrals

82,000

emergency referrals

2,800

hospital beds

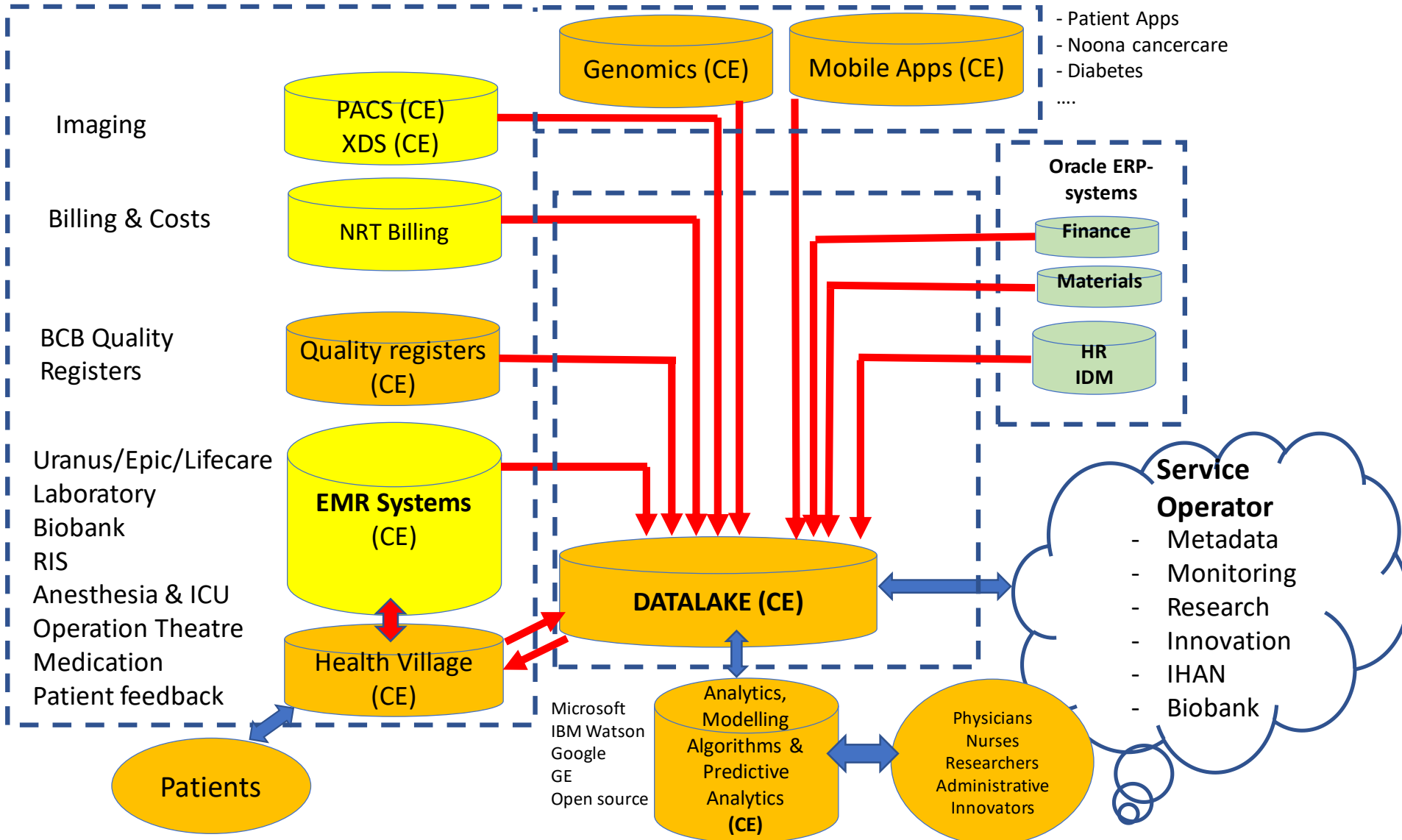


GETTING STARTED WITH AI – KEY QUESTIONS FROM HOSPITAL'S PERSPECTIVE

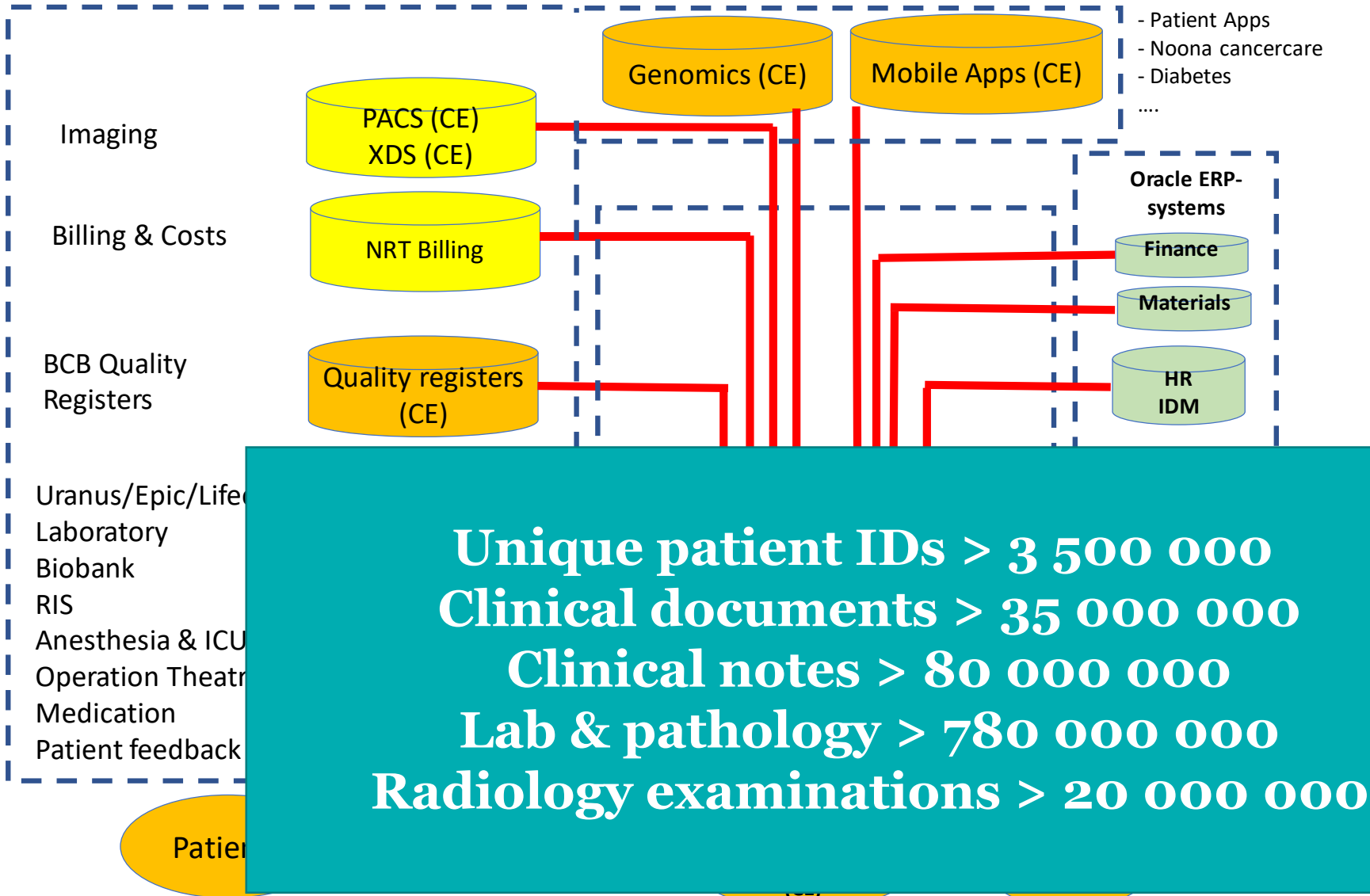
- How to make health data available for AI research and algorithm development?
- How to develop needed competences and engage with partners in co-development?
- How to get meaningful and validated AI tools to clinicians' use in patient care?



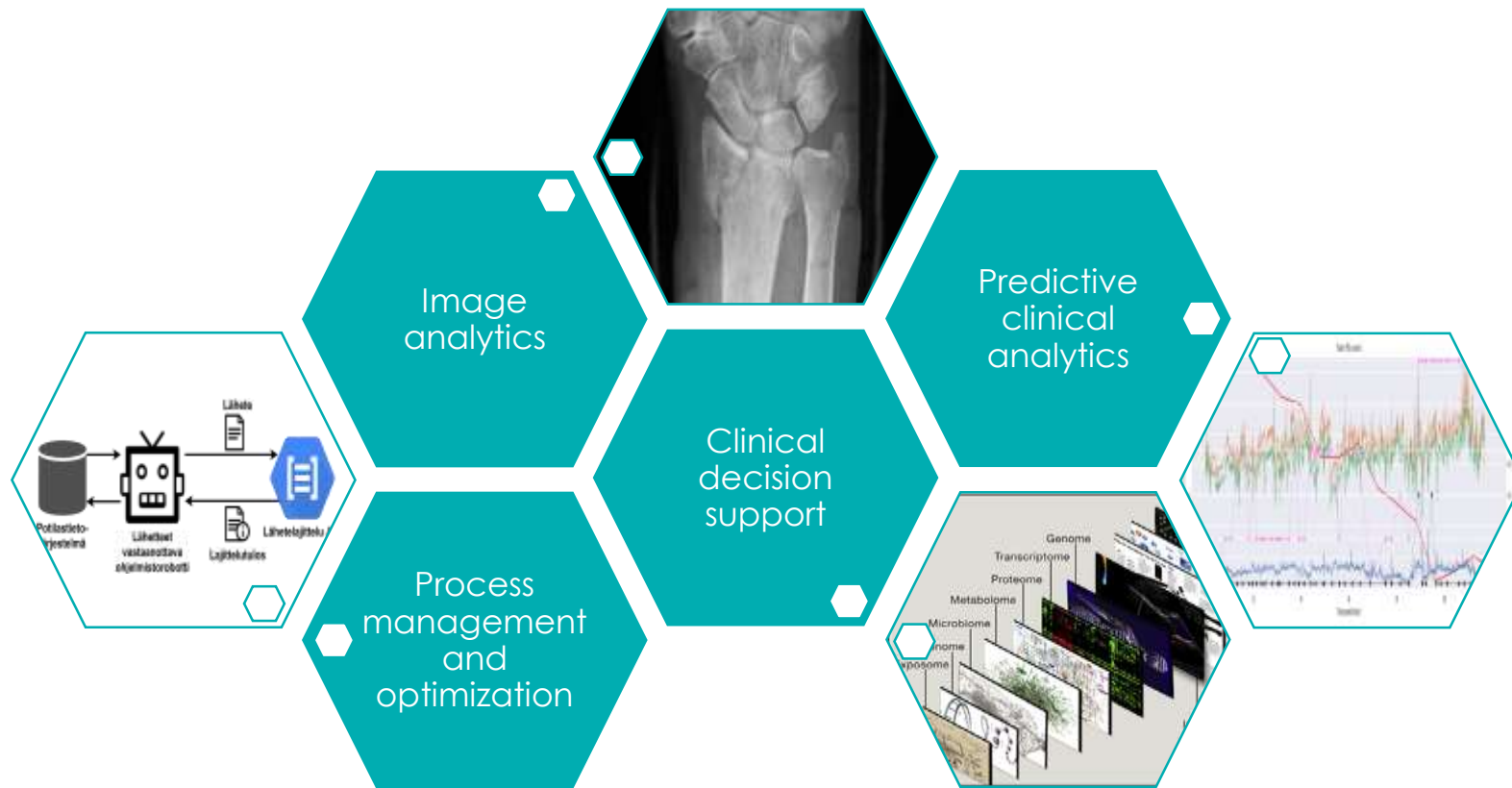
HUS DATA LAKE SOLUTION



HUS DATA LAKE SOLUTION



ARTIFICIAL INTELLIGENCE & HUS

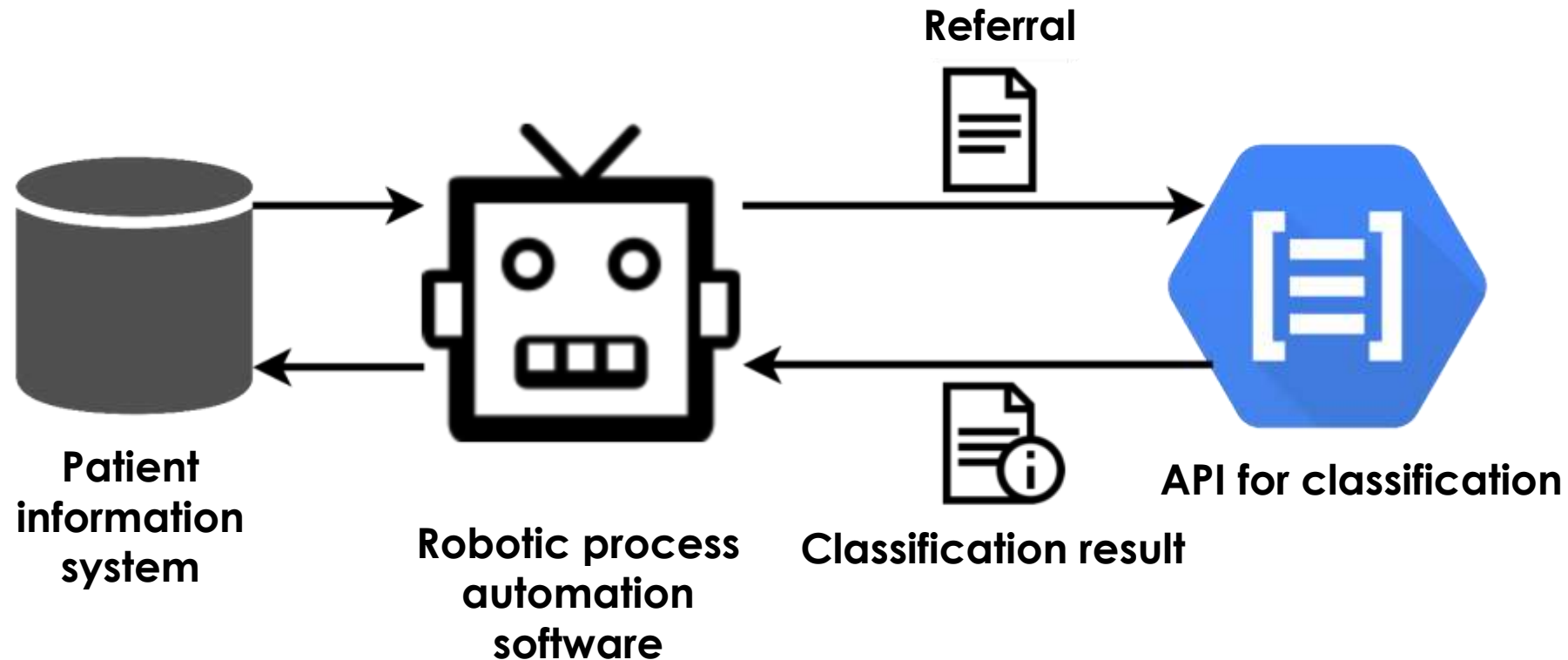


**Go for "Low hanging fruits" e.g.
automation of routine tasks
with RPA / Chatbots / AI**

**Improve understanding
through pilots – accept that
many pilots will fail**

**Build strategic understanding
of required competences,
tools and partners**

CLASSIFYING REFERRALS TO CLINICS



1st pilot in urology ~12 000 referrals/year -> saving 2 FTE

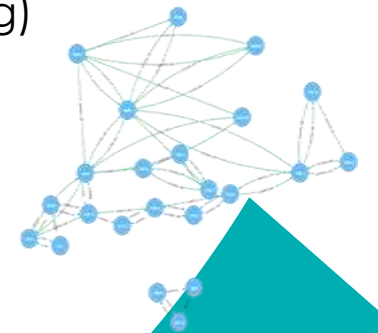
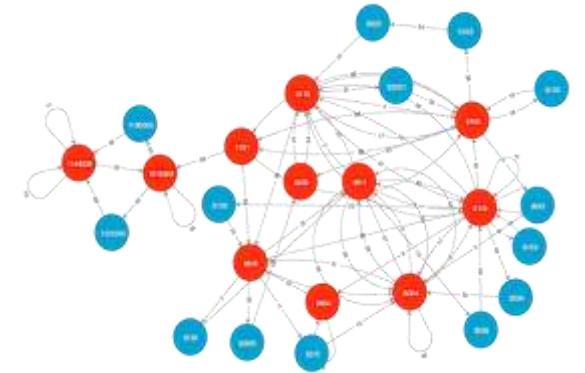


Detecting subarachnoid hemorrhage

- shortage of radiologists
- repeated misdiagnoses
- misdiagnose - 75% dies from a re-bleed in 1 year

RARE DISEASES AND FAILURE DEMAND

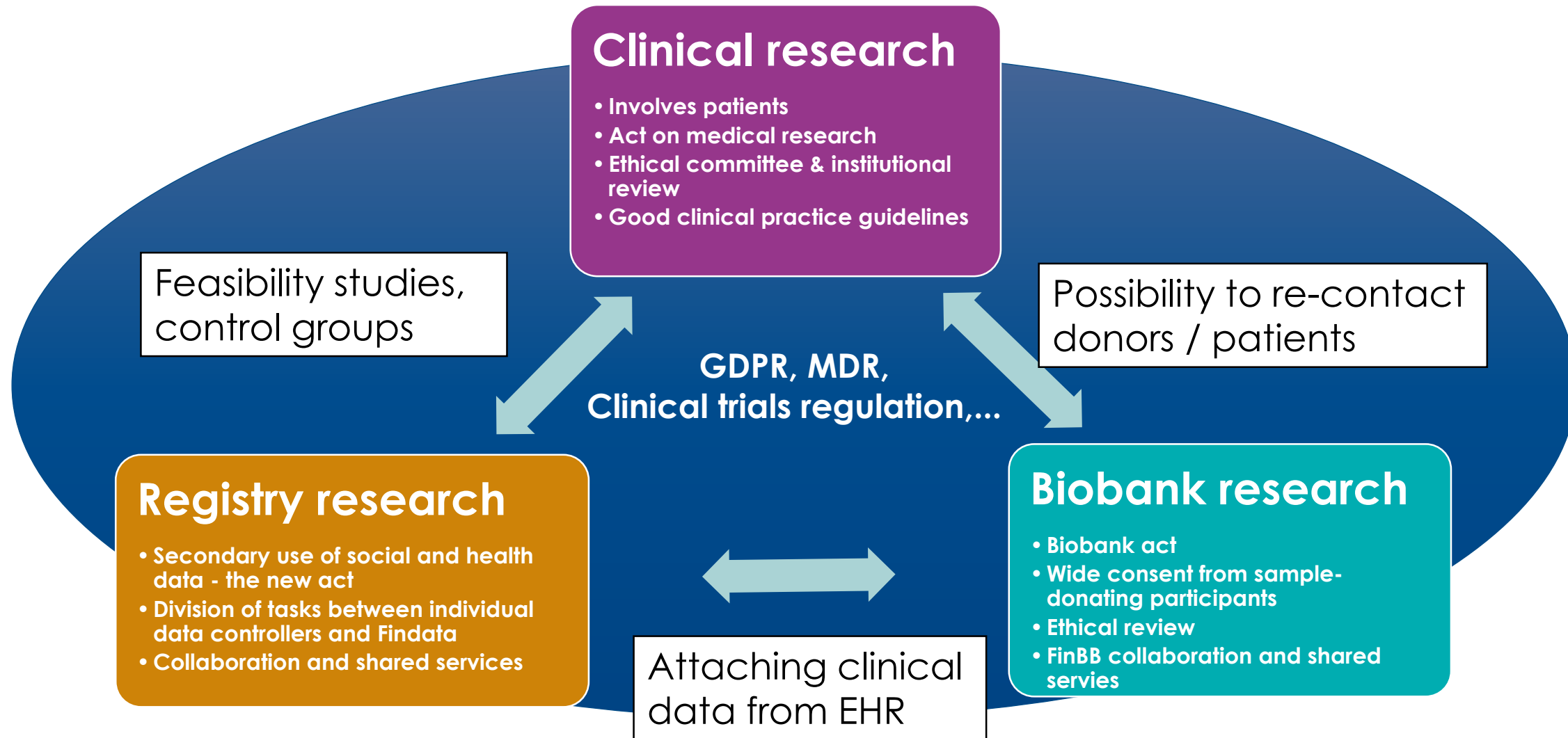
- Rare Diseases prevalence ~6%
- Total expenditure of (only) specialist care: 18% of yearly budget
- Excess expenditure ~ 270 million €/year
- 99 diseases with significant failure demand due to delayed dg
- Typically
 - Complicated, expensive pre-dg patient paths with **circular referral signatures**
 - Prediagnostic **comorbidity networks** (2-19 typical diagnoses before definite RD dg)
 - Opportunity: Expenditure ↓↓ due to effective therapy (up to 46,24-fold)





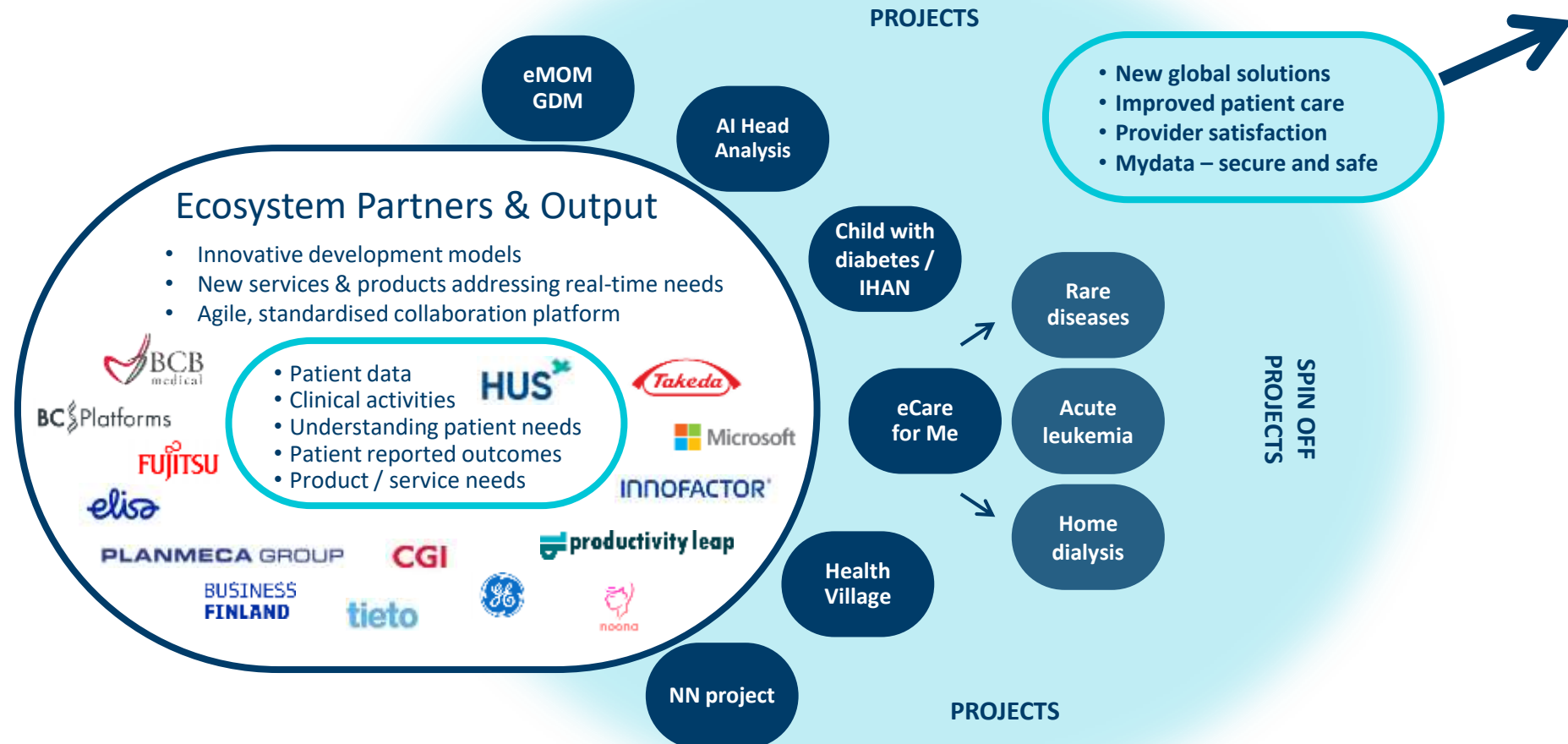
Septic infection in a small preterm baby

- life-threatening
- the baby gets very sick very fast
- severe complications
- difficult to predict



HUS DIGITAL HEALTH ECOSYSTEM

The world's fastest track to commercialization for digital health and wellbeing innovations



CERTIFIED QUALITY SYSTEM (ISO 9001, ISO 13485) HUS^{*}



Applications and systems for social and healthcare that utilize algorithms, artificial intelligence, machine learning and data analytics

IMPLICATIONS TO PHYSICIAN SKILLS AND EDUCATION

- AI will be part of routine tools for physicians -> basic understanding of AI for all
- Physician role is needed in every stage of AI development
 - **Problem identification and definition**
 - Information architecture and data management
 - Analytics and IT
 - Development and validation processes
 - Governance and ethics

AI in healthcare needs

- Relevant challenge
- Enough high quality data
- Verification & Validation

Collaboration is the key

- Top clinical scientists
- Top data scientists
- Top IT technicians