# Le sfide tecnologiche e organizzative che ci stanno di fronte

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Scan me!

# Umanimism and AI

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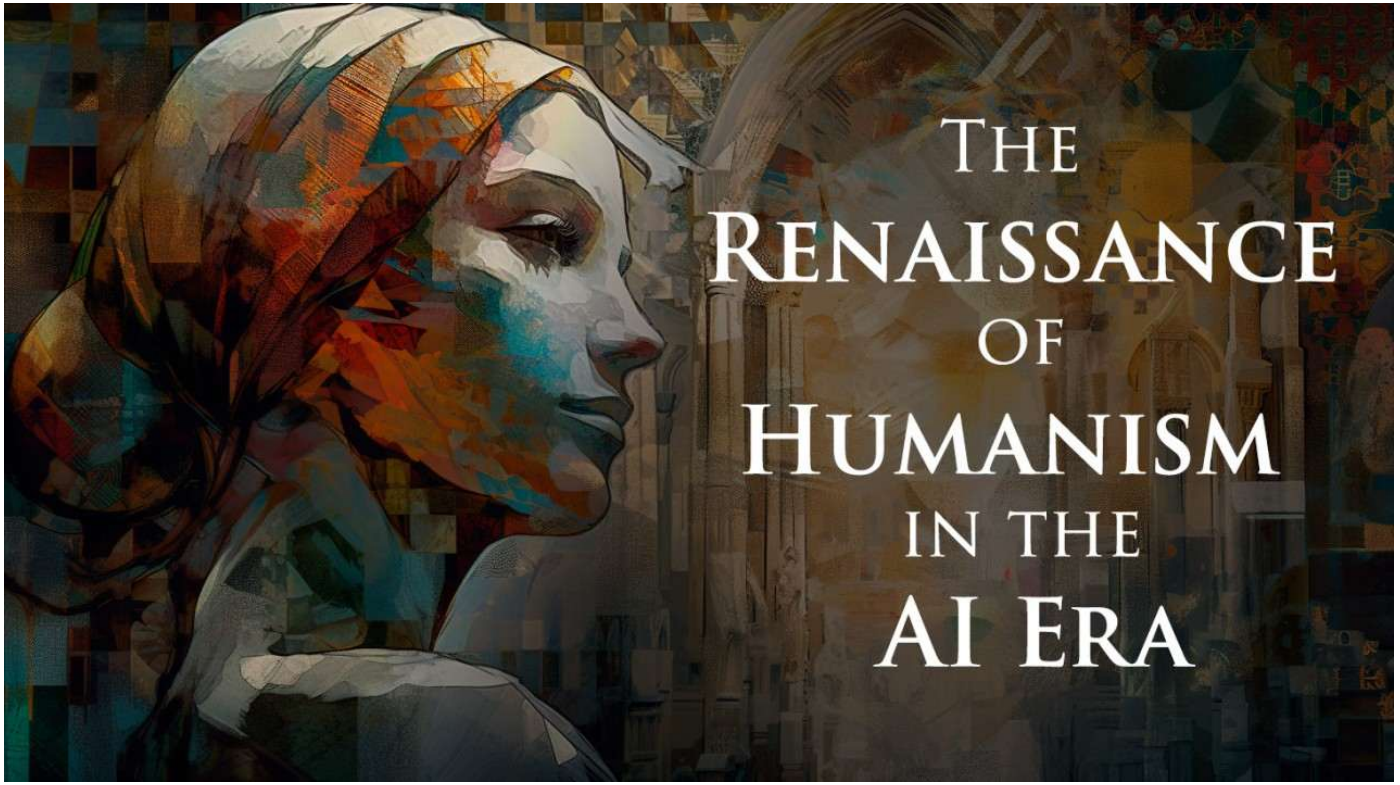
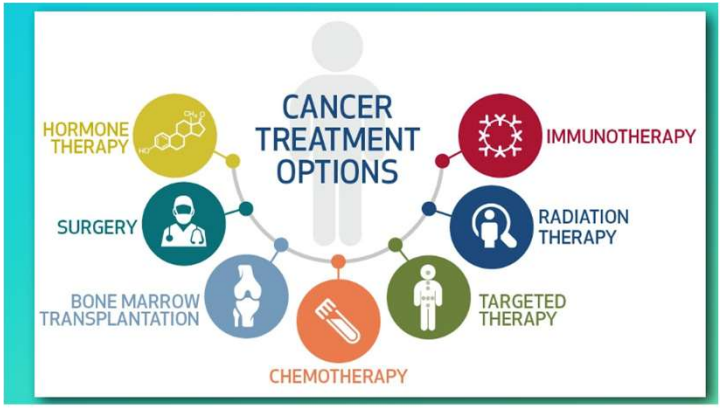
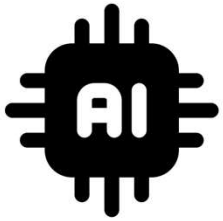
«AI can't come close to all the human bits of life. It can't replace human interaction. It doesn't know **what it means to be human around other humans**» (Eli Amdur, Forbes)

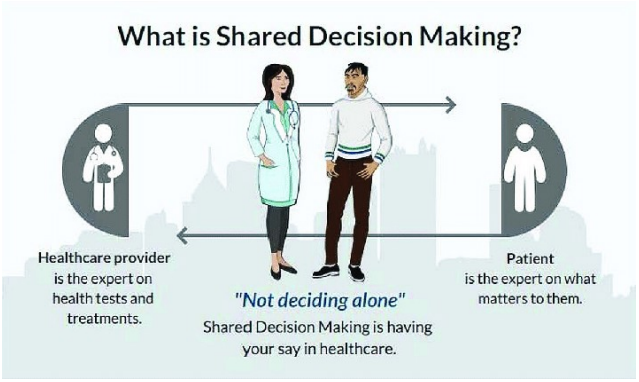


*"EVERY ALGORITHM THAT CAN LEARN FROM ANY TYPE OF (SPARSE) DATA **WITHOUT A PRIORI KNOWLEDGE** / BIOLOGICAL MODELLING OF THE PROCESS INVESTIGATED"*

# Challenges are embedded in clinical needs




- *"AI needs numbers as input, clinical research is based on questions"*
- *"Clinicians need an actionable as output, AI outputs are numbers (probabilities)"*
- *"Clinical questions may not be modelled as mathematically solvable problems"*

# AI Intepretability vs Explainability

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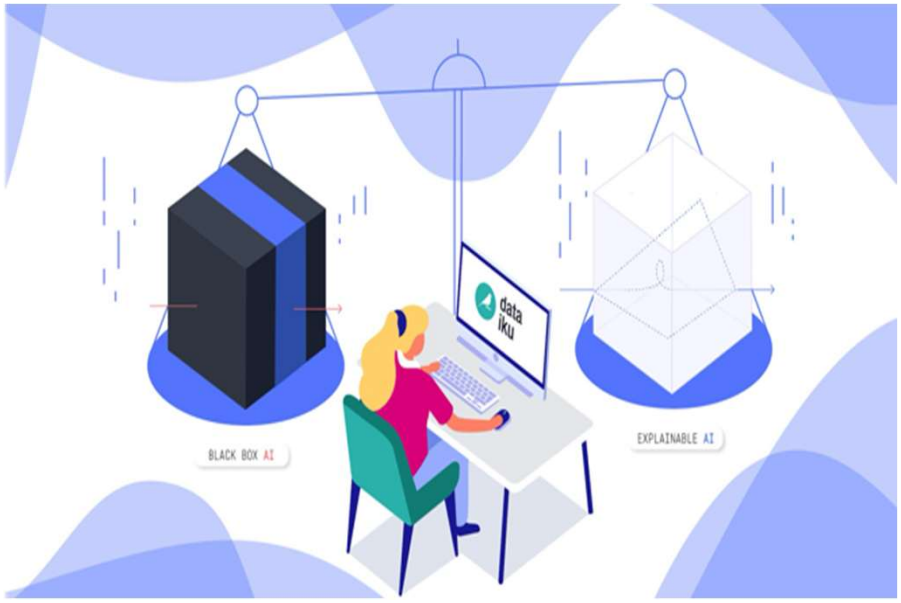
<Where are we going to stand in light of the **AI act** and **AI as a medical device**?>


«The data subject shall have the right not to be subject to a decision based solely on automated processing», article 22 GDPR


«Explainability is not mentioned but an *"Appropriate level of transparency (clarity) of the output and the algorithm aimed at users" is required*»




AUTOMATE

AUGMENT

# Digital maturity challenges

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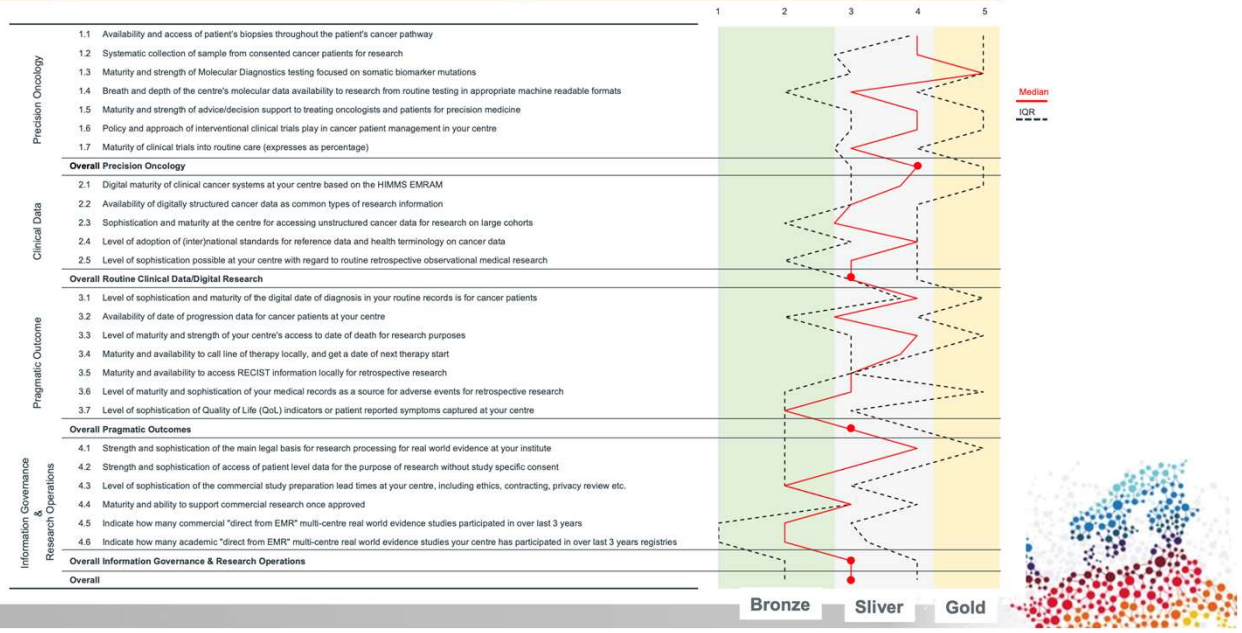
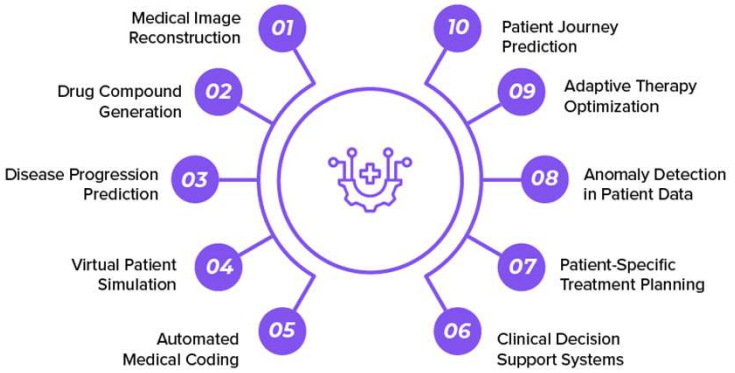
## Range of digital maturities in our community

DigiCore




## Technology **«enablers»**

### Generative AI in Healthcare Use Cases




appinventiv

# S-RACE: KEY FUNCTIONALITIES OVERVIEW

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- Galileo
- Laboratory Data
- Pathox
- PACS
- Topic-specific DB (eg. DB URI)
- eCRF (REDCap)
- Topic-specific DB (eg. DB Diabete and others)
- Other eCRF
- Omics

On prem Data Sources

= Main Data Sources, integrated
= Secondary Data Sources, integrated
= Integrated but in validation
= In roadmap

## Available Key Products

### 1 Universal Data Platform

Enterprise **data platform** integrating anonymized patient data (clinical, laboratory, images, pathological, etc.) and extracting clinically relevant information using **AI**

Anonymization Service
Data Lake
Cognitive Services
Health Data Services

**AI Services & Components**

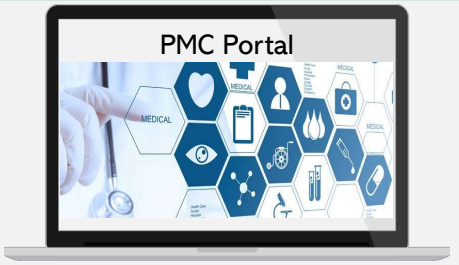
AI Document Intelligence & Language Recognizer
PII recognizers & De-identification
Text Analytics for Health

**Users**

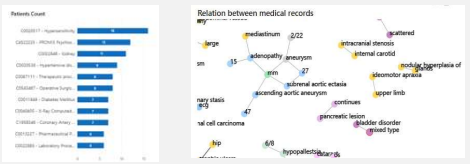
IT Admin
Data Engineers

### 2 Clinicians AI Hub (PMC)

**User friendly portal** used by researchers to search for, manage and organize clinical research and related machine learning models




**AI Services & Components**



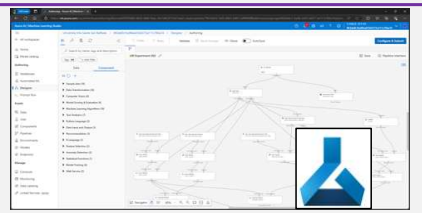
PowerBI **reports** showing output of **TA4H**

**Users**

Researchers
Data Analyst
PI

### 3 Data Science Lab

**Data science environment** to perform statistical analysis, answer clinical questions using **predictive algorithms** and manage end-to-end **machine learning models**



Machine Learning workspace for each use case

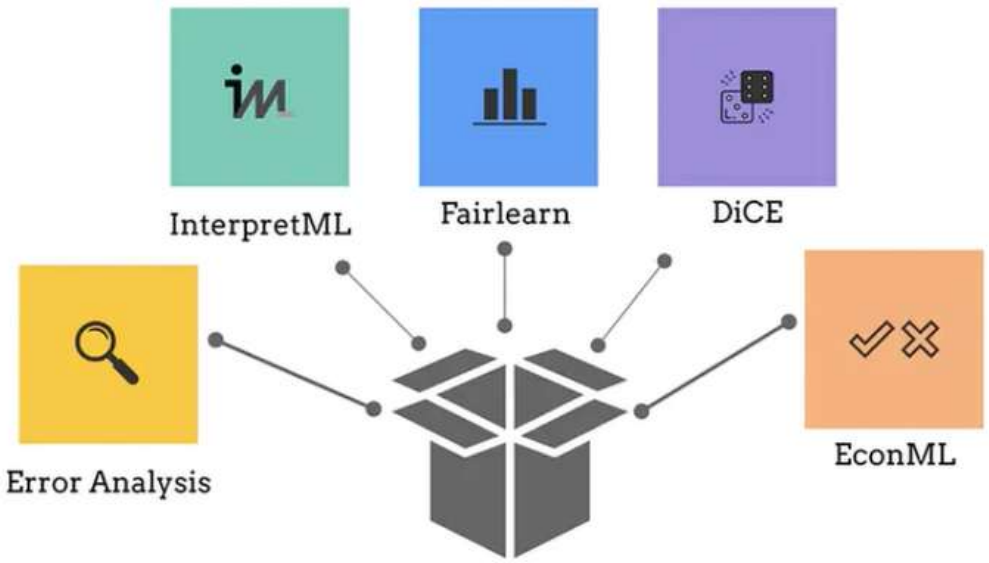
**AI Services & Components**

Code, Train, Deploy **ML models**

**Users**

Data Scientists
Data Engineers

# S-RACE Digital health platform: Explainable & Responsible AI




The **Responsible AI dashboard** provides a single interface to implement Responsible AI in practice. It brings together several mature Responsible AI tools.

**Model overview and fairness assessment**, how model's predictions affect diverse groups of people. (Fairlearn)

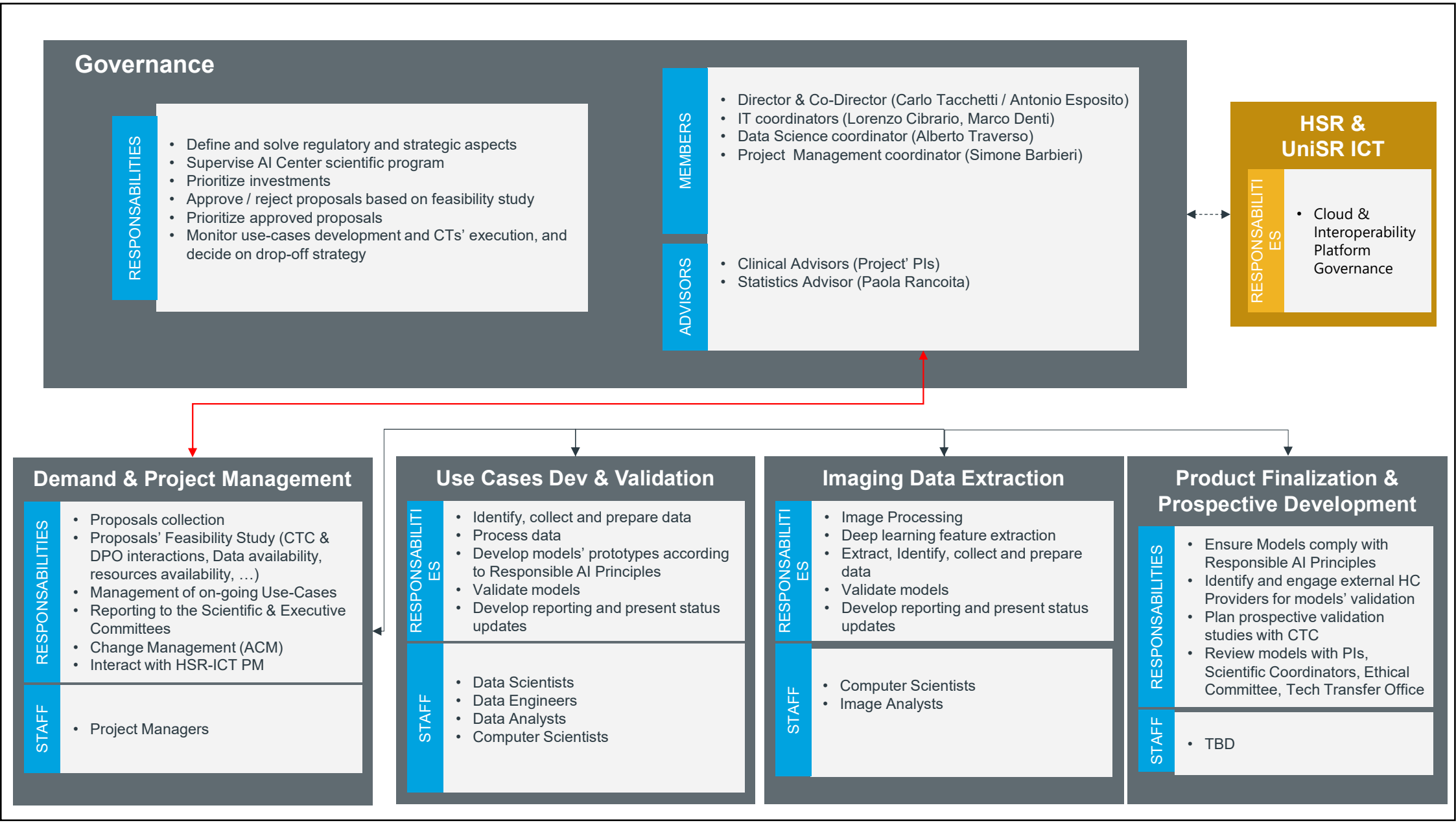
**Data analysis**, to understand and explore the dataset distributions and statistics.

**Model interpretability** to understand model's predictions and how those overall and individual predictions are made. (InterpretML)

**Error analysis**, to view and understand how errors are distributed in the dataset. (Error analysis)

**Counterfactual what-if**, to observe how feature perturbations would affect model predictions (DiCE)

**Causal analysis**, to use historical data to view the causal effects of treatment features on real-world outcomes.(EconML)


Governance
RESPONSABILITIES
Define and solve regulatory and strategic aspects
Supervise AI Center scientific program
Prioritize investments
Approve / reject proposals based on feasibility study
Prioritize approved proposals
Monitor use-cases development and CTs' execution, and decide on drop-off strategy
MEMBERS
Director & Co-Director (Carlo Tacchetti / Antonio Esposito)
IT coordinators (Lorenzo Cibrario, Marco Denti)
Data Science coordinator (Alberto Traverso)
Project Management coordinator (Simone Barbieri)
ADVISORS
Clinical Advisors (Project' PIs)
Statistics Advisor (Paola Rancoita)
HSR & UniSR ICT
RESPONSABILITIES
Cloud & Interoperability Platform Governance
Demand & Project Management
RESPONSABILITIES
Proposals collection
Proposals' Feasibility Study (CTC & DPO interactions, Data availability, resources availability, …)
Management of on-going Use-Cases
Reporting to the Scientific & Executive Committees
Change Management (ACM)
Interact with HSR-ICT PM
STAFF
Project Managers
Use Cases Dev & Validation
RESPONSABILITIES
Identify, collect and prepare data
Process data
Develop models' prototypes according to Responsible AI Principles
Validate models
Develop reporting and present status updates
STAFF
Data Scientists
Data Engineers
Data Analysts
Computer Scientists
Imaging Data Extraction
RESPONSABILITIES
Image Processing
Deep learning feature extraction
Extract, Identify, collect and prepare data
Validate models
Develop reporting and present status updates
STAFF
Computer Scientists
Image Analysts
Product Finalization & Prospective Development
RESPONSABILITIES
Ensure Models comply with Responsible AI Principles
Identify and engage external HC Providers for models' validation
Plan prospective validation studies with CTC
Review models with PIs, Scientific Coordinators, Ethical Committee, Tech Transfer Office
STAFF
TBD

# MANY ACTIVITES EXIST AT THE (INTER)NATIONAL / LOCAL LEVEL

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Associazione Italiana per l'Intelligenza Artificiale

## INTELLIGENZA ARTIFICIALE PER LA SALUTE

### Coordinatori +

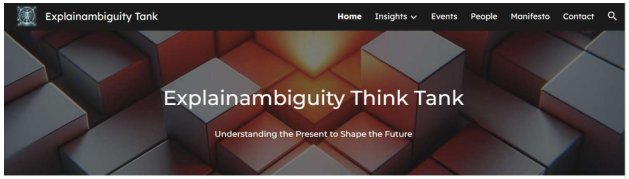
**Francesco Calimeri**
Università della Calabria
Coordinator

**Mauro Dragoni**
Fondazione Bruno Kessler
Coordinator

**Fabio Stella**
Università di Milano-Bicocca
Coordinator

### Ambito e Obiettivi +

The AI-HCare Group is a working group of the Italian Association for Artificial Intelligence (Associazione Italiana per l'Intelligenza Artificiale, AI*IA). The main goal of the group is to promote all kinds of activities in the field of Artificial Intelligence applied to healthcare, and foster collaborations among research groups, associations, institutions, industrial players and any kind of stakeholders, with a special focus on the Italian ecosystem.




Explainambiguity Think Tank is dedicated to addressing the complexities and ambiguities inherent in the integration of Artificial Intelligence (AI) within the pharmaceutical and healthcare sectors.
Our mission is to provide clarity, foster innovation, and ensure regulatory compliance by tackling the root causes of ambiguity in AI applications. By doing so, we aim to drive business success through enhanced transparency, trust, and efficiency.
Join us in our mission to clarify the ambiguous, ensuring a safer, more efficient, and innovative healthcare landscape. Together, we can transform challenges into opportunities for growth and improvement, driving business success through AI clarity.

latest insights

**Beyond the Lab: Clinical Trials**
Agenda Digitale · April 29, 2025
Explore how artificial intelligence (AI), biomarkers, and innovative trial technologies are creating a more efficient, data-driven future for drug discovery. From better patient selection to smarter trial design, see how clinical research is evolving to deliver new therapies faster.

**Scoperta di nuovi farmaci: che succede se l'AI sostituisce il caso?**
Agenda Digitale · April 23, 2025
L'intelligenza artificiale sta trasformando la scoperta di farmaci, riducendo la casualità a favore della razionalità computazionale, sollevando interrogativi sull'equilibrio tra efficienza e innovazione scientifica.

**Early evidence and emerging trends: How shaping drug discovery and clinical development**
Drug Target Review · April 11, 2025
Drug development is plagued by high costs, long timelines and low success rates, but what if AI could change that? Read on to discover real-world examp and explore the transformative potential of AI in dru development.

New Online | Views 5,747 | Citations 2 | Altmetric 9 | Comments 1

Viewpoint | AI in Medicine

FREE

February 10, 2025

## Moving Toward Implementation of Responsible Artificial Intelligence in Health Care

### The European TRAIN Initiative

Michel E. van Genderen, MD, PhD[1,2]; Ilse M. J. Kant, PhD[3]; Carlo Tacchetti, MD, PhD[4,5]; Stefan Jovinge, MD, PhD[6,7]

Author Affiliations | Article Information

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# TIME TO JOIN FORCES: AN AI GOVERNANCE MODEL (Expertise finder)

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| | |
|---|---|
| **Steering committee** | Healthcare stakeholders (including patients + government) |
| **Pillars** | Beating cancer, Reduce Costs, Early detection, reduce AI illiteracy |
| **Challengers** | Regulatory, data, technological |
| **Enabling technologies** | Generative AI, Machine Learning, Anonymization |
| **Expertise matcher** | Academia, industry, Focus specific societies, infrastructures (S-RACE) |
| **Task forces** | Consortia of partners. Possibility to apply for funding (PNRR like?) |