



This project is co-financed by the European Union
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Istanbul Technical University

One of the oldest technical universities in the world

67 programs in 5 campuses, 13 colleges, 1 conservatory located in the city center

More than 400 laboratories and 17 research centers

Home to science-industry-technology with more than 2500 R&D projects

#=326

QS World University Rankings

#=40

QS WUR Ranking By Subject

#2

Europe University Rankings -
Western Asia

My Teams' Expertise



Health informatics

AI

Data Mining

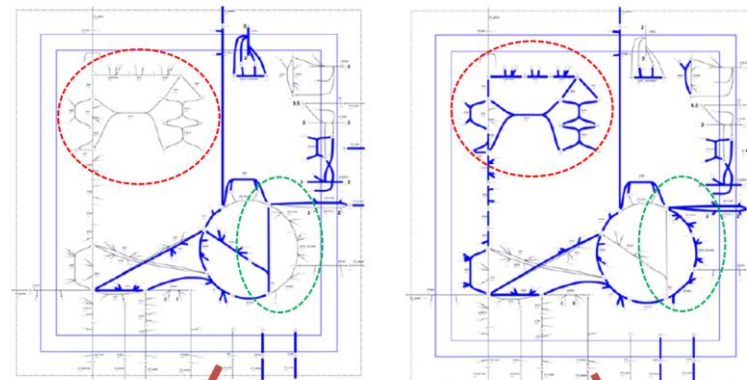
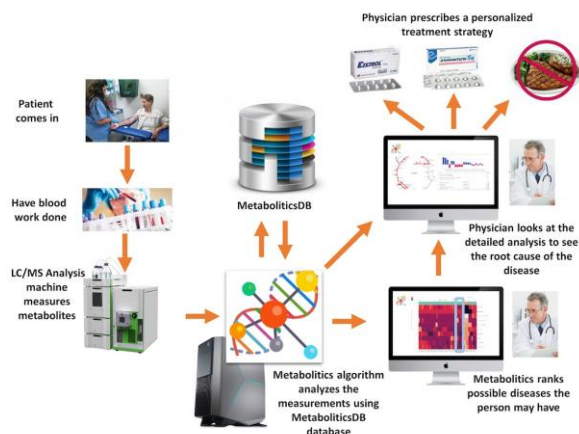


Bioinformatics

Databases

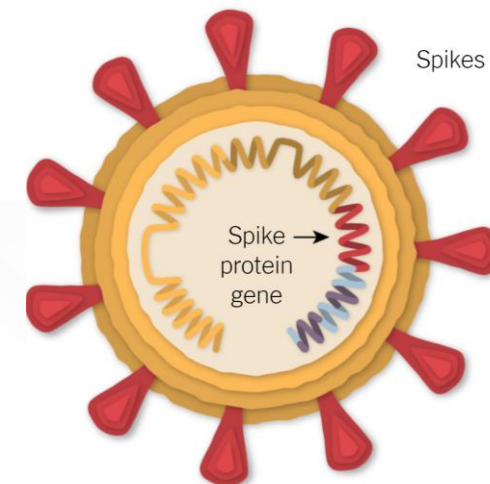
Data Management

Clinical Metabolomics

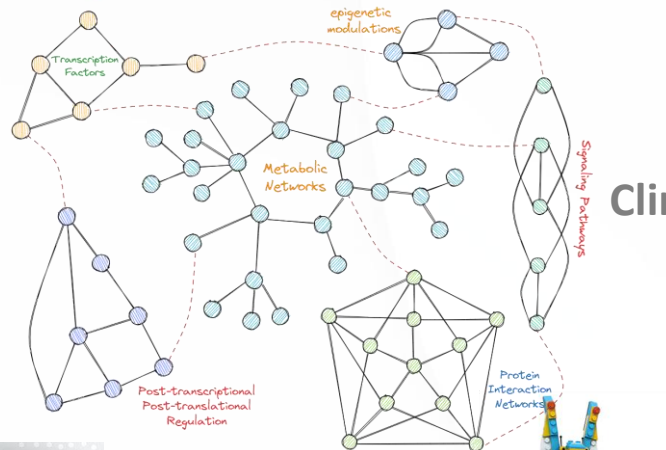
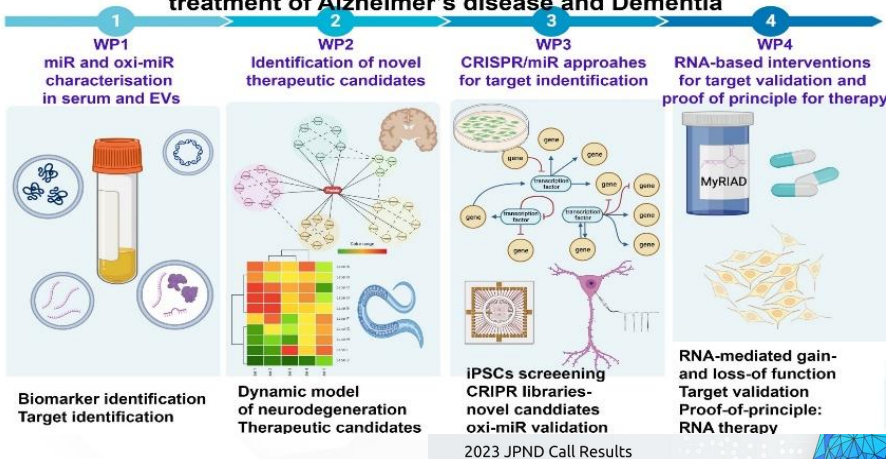


Personalized Treatment Recommendation

Predicting Future Virus Mutations

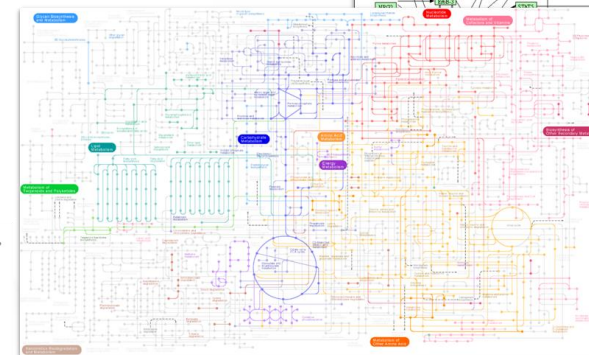
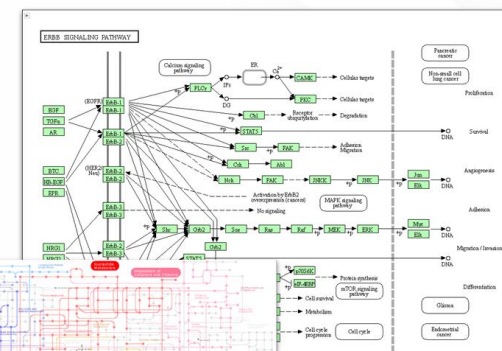


(Micro)RNA and Informatics approaches for diagnosis, prognosis and treatment of Alzheimer's disease and Dementia



Multi-omics Clinical Data Analysis

Drug Repositioning



Project Idea

Call Topic: HORIZON-HLTH-2025-01-DISEASE-06: Implementation research addressing strategies to strengthen health systems for equitable high-quality care and health outcomes in the context of non-communicable diseases (GACD) - Single Stage

Deadline Dates: 18/09/2025

- ☐ **Project Objective:** Develop a Decision Support System to Help Clinicians Make Discharge and Planned Readmission Decisions
- ☐ **Expected Results:** Reduced Cost on Health Systems
Increased Patient Life Quality
Improved Efficiency of Resource Utilization in Hospitals

Motivation

- Push for electronic health records
- Intelligent systems to derive invaluable insights
 - Discovering hidden patterns and relationships
- An important issue:
 - Need for readmission shortly after discharge
- Almost always unplanned
- Huge amount financial costs
- Resource contentions at hospitals
- 20% of Medicare patients re-hospitalized within 30 days after discharge
 - Cost: \$17.4 billion annually (Jencks, 2009)

Motivation

- The first point of entry: emergency rooms
 - more expensive operating cost
 - make crowded emergency rooms even more crowded
 - increased average waiting times
- Readmission in a worse condition than discharge time
 - extended recovery time
 - decrease in life quality
 - loss in employment time.
 - increased risk of hospital-acquired infections

Motivation

- From hospitals' perspective:
 - a high rate of re-admission → insufficiency of the quality of medical care services
 - part of hospital performance criteria in some countries
- Re-hospitalization could be prevented between 12% and 75%
 - patient education, pre-discharge evaluations, and complementary therapies applied at home
 - (Benbassat and Taragin, 2000)

Project Idea

- ❑ Develop readmission risk prediction models for multiple diseases:
 - ❑ Statistical machine learning models to predict the risk of readmission initially for the following 8 disease groups:
 - ❑ myocardial infarction, chronic obstructive pulmonary disease, heart failure, pneumonia, diabetes mellitus, stroke, dementia, and Alzheimer's disease.
 - ❑ The most contributing diseases to the yearly overall unplanned readmission costs

Project Idea

- ☐ Develop a patient discharge decision support system based on readmission risk:
 - ☐ develop a clinical decision support system
 - ☐ integrate the readmission risk prediction models
 - ☐ provide assistance to clinicians
 - ☐ make a more informed discharge decision based on patient data

Project Idea

- ☐ Develop a remote follow-up program integrated with readmission risk prediction models and connected to the workflow of healthcare providers
 - ☐ follow-up with patients after they are discharged
 - ☐ patients to be provided with a set of portable measurement devices
 - ☐ blood sugar measurement tool, blood pressure monitor, etc.
 - ☐ patients periodically communicate measurements through a mobile app or web-based tool to their health care provider
 - ☐ readmission risk models continuously evaluate the stream of remote measurements
 - ☐ high readmission risk → notify healthcare provider and the patient
 - ☐ a physician will get in touch with the patient
 - ☐ schedule a visit or a planned admission
 - ☐ consider readmission risk score, the availability of hospital bed space, etc.

Project Idea

- ☐ Developing a cost-aware readmission recommender model
 - ☐ enrich readmission risk monitoring system with a cost model
 - ☐ consider the cost of unnecessary hospital stay of a patient vs. the cost of delaying a readmission
 - ☐ risk of patient getting into a worse condition
 - ☐ returning to the hospital via emergency room.
 - ☐ before calling for a scheduling of a planned admission, the cost will also be a contributing factor.

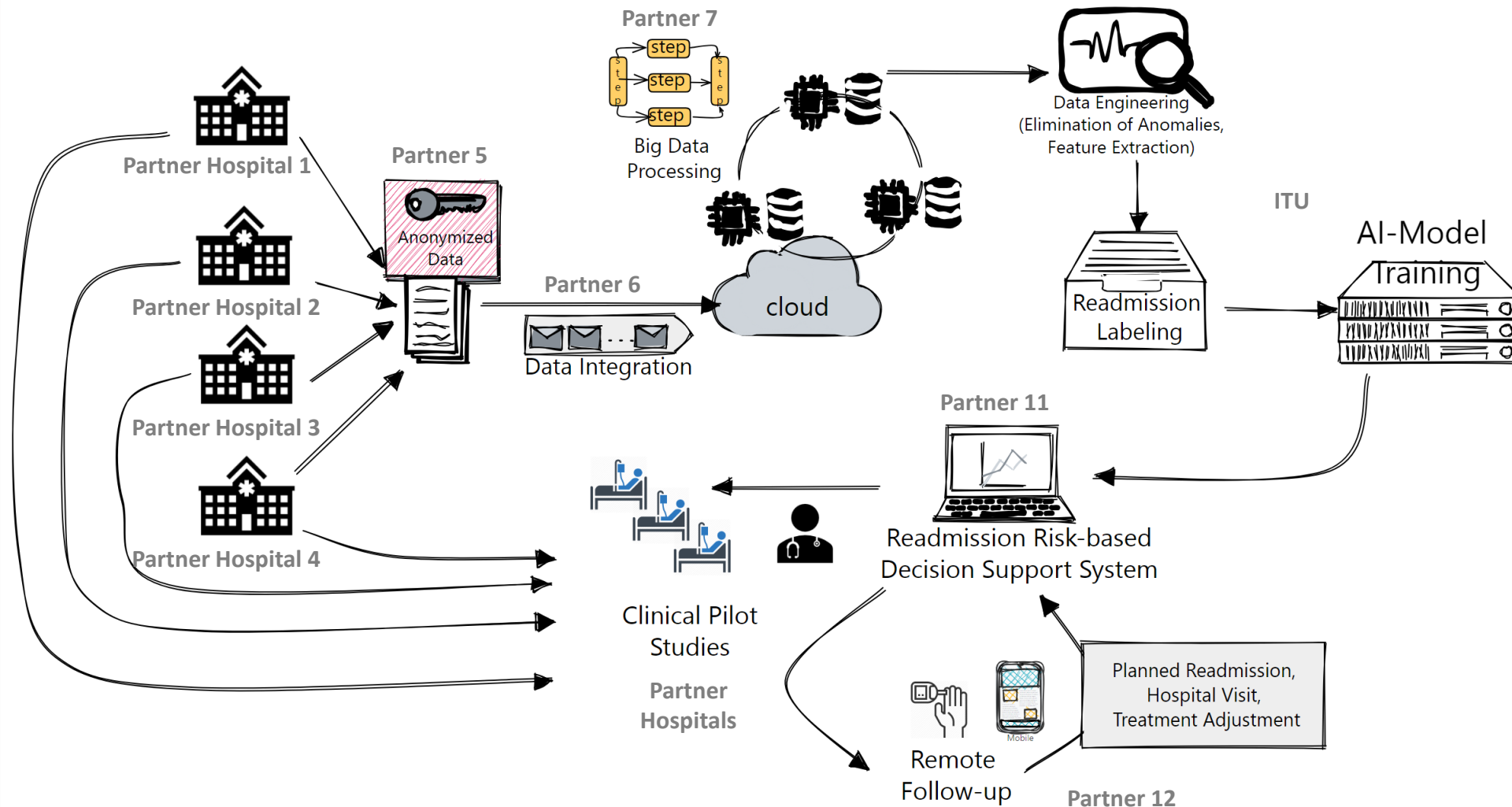
Project Idea

- ☐ Developing mobile and web apps to support data entry and reporting
 - ☐ a mobile app for patients to enter their measurements remotely.
 - ☐ web interfaces to create reports for healthcare providers about the currently monitored patients.

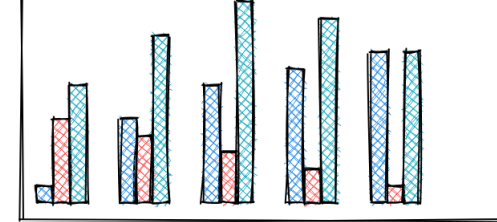
Project Idea

- ☐ Develop a framework for interoperability
 - ☐ enable re-use of health data, data analytics and metadata from different repositories across countries
 - ☐ compliance with FAIR data management principles
 - ☐ as well as national and EU legal and ethical requirements
 - ☐ the standardization of meta knowledge (meta data, ontologies and reference repositories) and clinical data,
 - ☐ especially health data coming from different clinical services and sites, and/or from multiple countries.
 - ☐ taking into account the Commission Recommendation on a European Electronic Health Record exchange format

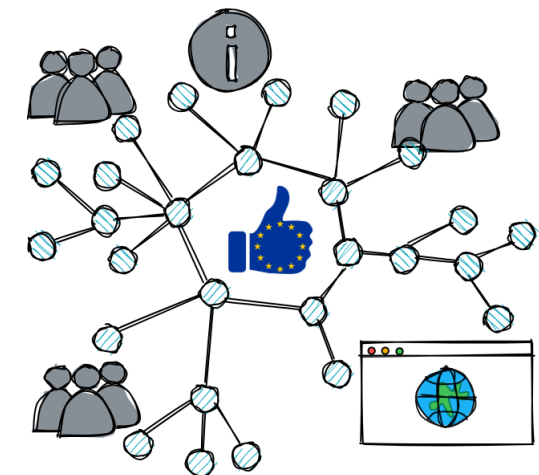
Big Picture



Partner 8 Fiscal Impact Analysis



Commercialization Partner 9



Dissemination / Outreach Partner 10

Project Idea

- ☐ health data coming from a number of countries
 - ☐ a representative sample of the European healthcare landscape
 - ☐ contribute to the creation of the European Health Data Space
- ☐ Turkey
 - ☐ 12 large-scale research hospitals serving 10+ million people in Istanbul region
- ☐ Country 2
 - ☐ ??
- ☐ Country 3
 - ☐ ??
- ☐ Country 4
 - ☐ ??

Consortium Structure

| No | Partner Name | Type | Country | Role in the Project |
|----|-------------------------------------|------------|---------|---|
| 01 | Istanbul Technical University (ITU) | University | TR | Coordinator, Readmission Risk Prediction Models |
| 02 | Partner 1 | Hospital | Any | Data Provider, Data Curator, Pilot Study Conduction |
| 03 | Partner 2 | Hospital | Any | Data Provider, Data Curator, Pilot Study Conduction |
| 04 | Partner 3 | Hospital | Any | Data Provider, Data Curator, Pilot Study Conduction |
| 05 | Partner 4 | Hospital | Any | Data Provider, Data Curator, Pilot Study Conduction |



Consortium Structure

| No | Partner Name | Type | Country | Role in the project |
|----|--------------|------|---------|---|
| 06 | Partner 5 | Any | Any | Data Anonymization, Data Encryption, Secure Data Transfer, Legal Compliance |
| 07 | Partner 6 | Any | Any | Data Integration - Interoperability |
| 08 | Partner 7 | Any | Any | Big Data Processing and Management |
| 09 | Partner 8 | Any | Any | Fiscal Impact Analysis |

Consortium Structure

| No | Partner Name | Type | Country | Role in the project |
|----|--------------|------|---------|---|
| 10 | Partner 9 | Any | Any | Commercialization, Certification, Business Development |
| 11 | Partner 10 | Any | Any | Dissemination / Outreach / Patient Group Collaboration |
| 12 | Partner 11 | Any | Any | Mobile and Web Apps – Hospital Information System Integration |
| 13 | Partner 12 | Any | Any | Remote Patient Follow-up |



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