Artificial Intelligence Testing and Experimentation Facilities for Health

AI TEFs for Health

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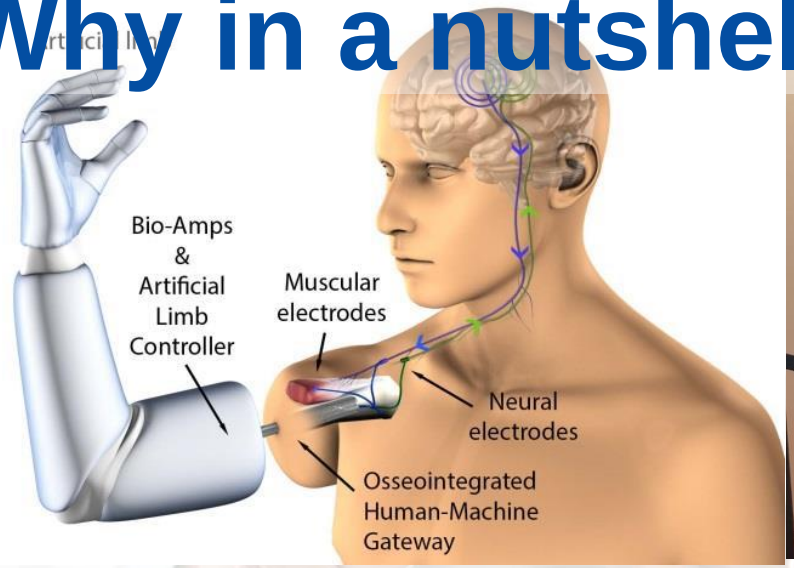
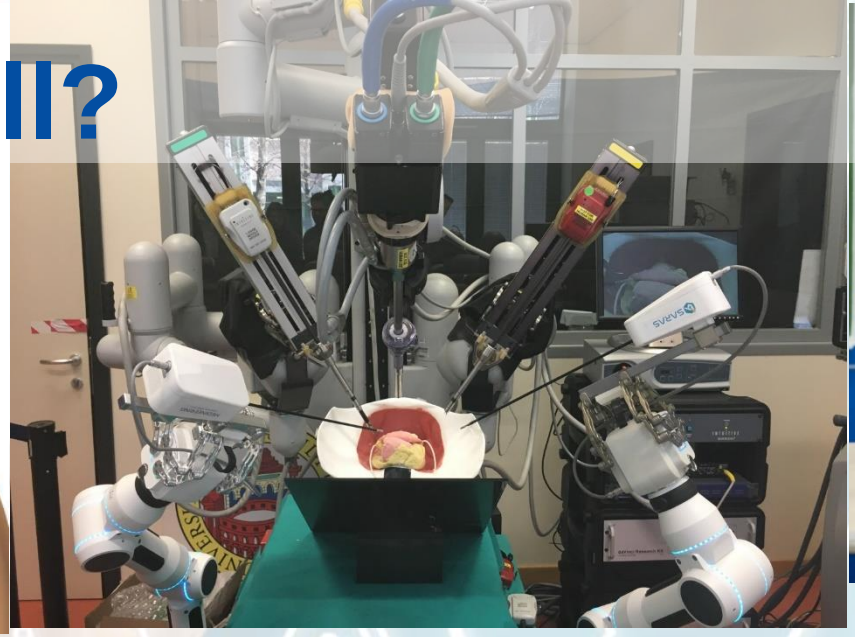
Why in a nutshell?





- Technologies based on Artificial Intelligence (AI) and robotics will improve the efficiency, security, and quality of the prevention, detection, diagnosis, treatment, care, rehabilitation and monitoring of European citizens' health, as well as promote healthy lifestyle.
- Existing hospitals often do not have the staff, the money nor the mandate to investigate new solutions
- Testing should be done in real environments, with real patients
- TEF costs a lot of money, takes time and require a lot of administrative authorisations and certifications
- Sharing them is much more efficient

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Outcomes from Previous Workshops (23/01 & 3/07/2020) Objectives

- Accelerating the testing by mutualising the infrastructures as well as the administrative, medical and ethical procedures and certifications
- Advancing personalised medicine and person-centred care
- Increasing the effectiveness, resilience and sustainability of European healthcare systems
- Reducing healthcare delivery inequalities in Europe

Outcomes from Previous Workshops Characteristics 1

- Providing **physical and digital access** to large resources and offer support, research partners, clinical expertise, expertise in AI and robotics, data and training.
- **Close to where healthcare services are provided**
- Covering **multiple healthcare processes** within the realm of research, innovation and regulation (hospitals, health centres, universities, RTOs, innovation ecosystems - like incubators, clusters, accelerators, public health or certification agencies, healthcare companies of any sizes when relevant).
- Covering the **demonstration, testing and validation in real environments**, possibly with real patients, but also ethical and data protection reviews, certification, market analysis, IP protection, incubation and business development
- Allowing large-scale in-silico, in vitro, ex-vivo and in vivo testing, when relevant

Outcomes from Previous Workshop Characteristics 2

- A clear policy to be shared among different TEFs on **access, treatment and ownership**.
- **Shared rules and common on interoperability and protocols**, regulators and private sector playing a key role.
- **Procurers** (such as national/regional authorities, agencies, hospitals amongst others) should be included, stimulating the demand and supporting the **adoption** of the solutions
- Could include partners competent in working with notified bodies or national agencies providing faster and swifter access to **certification**
- **IP issues**

Key Applications

- Support to doctor’s decision-making (e.g, specific treatments for specific patients, including predictive and gender-specific treatments)
- Logistics, management of flows and process within healthcare facilities including hospitals
- Robotics surgery
- Detection of tumours from imaging
- Discovery of new drugs in various fields including cancer and paediatrics
- Monitoring long-term conditions in function of treatment (e.g. diabetes mellitus, neurodegenerative diseases etc.)
- Active and Assisted Living technologies for elderly and disabled persons
- Rehabilitation
- Care beyond healthcare: prediction, prevention, rehabilitation and support

Examples University Hospitals

- Already in network, around 10 of them in the EU
- Focus for instance on Cancer or Pediatrics
- Integrated Ecosystem with Clinical & MedTech, Trials Office, International Research & Business (Big Companies, SMEs, Start-Ups), Scientific Association & Policy Makers Medical, Technical, Business, Legal, Ethical services
- AI, Robotics, MedIoT, IoT to Support Patient Safety, Quality of Care, and Process Efficiency
- Access to medical staff and patients is vital

Example – Home or Village for Active and Healthy Ageing

- Large-scale testing environment of technologies for Active Ageing
- Includes hospitals, care facility, insurance, ethics, legal, social bodies , nursing school
- Care facilities of the future —> real-world apartments with IoT and sensors for better health monitoring of elderly people
- Real-world technologies and reference and standardized infrastructures for accessibility, educational programs for HCWs
- Special research zone, including testbeds, field testing, legal sandboxing, certification
- Embedded ethics / legal / social paradigm

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Expected Impact

- Validation in real conditions of innovative AI and robotics technologies in healthcare applications
- Efficiency and safety of treatments
- Improved operational and clinical workflows
- Better clinical outcomes and enhanced patient experience
- Enhanced professional experience, including education and training opportunities
- Acceleration of the adoption of AI and robotics technologies in the healthcare sector, reinforcement of the digital health ecosystem and reduction of the innovation gap
- Innovation capacity and competitiveness improvement of the European healthcare industry
- Better compliance with relevant regulations of healthcare products

Questions 1/2

1. What are the biggest needs and gap such TEFs could fill in your Member State or in Europe?
2. What kind of TEFs would you have in mind? For example: a university hospital with access to patients, a village testing active and assisted living technologies?
3. Which are the existing facilities in your Member State, which could be upgraded to a TEF?
4. How can it be ensured that the results/products tested and validated in a TEF based in one MS could have an impact in all Europe?
5. What should a TEF consortium look like (what roles and expertise)?
6. Do you think the TEFs should be run:
   - as consortia, bringing together several facilities (each of them usually represents one physical location) from different countries,
   - or as individual facilities?
7. -From previous consultations, we gathered that TEFs should allow for large-scale in-silico, in vitro, ex-vivo and in vivo testing, when relevant. Do you agree with this and how difficult and resource consuming would testing large-scale health datasets or registries be in your opinion?

Questions 2/2

8. In case the TEFs will have the possibility to test large health datasets, how difficult/realistic do you see the process of obtaining the data – from a hospital, research institute, pharmaceutical company, insurance company, etc?
9. How to ensure equal access for all European providers, making TEFs a truly European resource? Should co-funding Member States help in dissemination about the TEFs?
10. How to ensure a high interest for using the facilities even if the users have to cover their own costs?
11. Should the process of certification be part of the services offered by a TEF? Should it be centralised? How to work with certification authorities and existing certification bodies?
12. Should a TEF have a particular technological focus in, for instance, Robotics, or IoT, or particular health focus, such as Cancer or Active and Assisted Living?
13. What you consider to be particularly important in drawing up the call text?
14. Which are the types of product, service and process innovations that could stem from the creation of such a TEF?
15. What are the most appropriate Key Performance Indicators (KPIs) to assess the outcomes?