Health and Health-Related Data: The Foundation for eHealth

Maria Marques[1], Carlos Agostinho[1,2] and Ricardo Jardim-Goncalves[1,2]

[1] Centre of Technology and Systems, UNINOVA, 2829-516 Caparica, Portugal
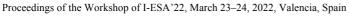[2] NOVA School of Science & Technology, 2829-516 Caparica, Portugal

The European Commission defines eHealth as "tools and services that use information and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health-related issues and to monitor and manage lifestyle-habits that impact health".

With a considerable slowdown in population growth, an acceleration in population ageing and an increase on citizens mobility in their professional, leisure and on holidays, Europe constitutes a multidimensional challenge for eHealth that has only became more evident with the outbreak of COVID-19 pandemic. From Electronic Health Records (EHR) and Electronic Medical Records (EMR), Telehealth and Telemedicine, Mobile Health (mHealth), Big data systems and Artificial Intelligence for eHealth, to all the critical aspects related with Health Data Security, Privacy and Trust, Integration and Interoperability, eHealth stands as the concept underpinning the real involvement of the citizen/patient as central actor in the health decision process. The objective of this workshop was to show the results achieved so far in 3 EU funded projects on eHealth (Smart4Health, Smart Bear and ICU4COVID), as well as demonstrate those results and invite participants to a discussion around these topics.

An initial presentation served as framework for the complete set of projects involved, and specially for Smart4Health and Smart Bear has the ones where the citizen takes a central role as co-producer of health data. Within this presentation, several videos were presented to demonstrate aims and functionalities. The videos aimed at helping the audience to grasp the possibilities of eHealth and to kick-off discussion.

The workshop followed a dynamic approach where papers presented were aligned with the topics being raised. In concrete, the following four papers were presented:

- A methodology for trustworthy IoT in healthcare-related environments in which the focus was on how IoT can support adaptations to elderly allowing independent and healthier life. IoT can help elder citizens stay healthier at home, since it has the possibility to connect and create non-intrusive systems capable of interpreting data and act accordingly. The paper focuses on the detection of falls and the experimental results have more than 80% of reliable performance.
- Healthier and Independent Living of the Elderly: Interoperability in a Cross-Project Pilot which discussed how digital health can be exercised by anyone owning a smartphone and parameters such as heart rate, step counts, calorie intake, sleep quality, can be collected and used not only to monitor and improve the individual's health condition but also to prevent illnesses. Also, discussion focused on aspects such as sharing digital health data, either from Electronic Health Records (EHR) or sensor data from the IoMT, in which privacy and security concerns are key.
- Seamless wearable data collection in a mobile environment. In this regard, discussion was focused on how wearables are increasing and enabling the growth of digital health solutions. The Citizen Hub app allows to connect different devices in an aggregated way and provide feedback and insightful information about wellbeing and health. The app thrives to deliver a complete and dynamic solution for ICT interoperability, while maintaining security, trustworthiness and privacy methodologies as well as compatibility with relevant standards.

- Smarterization of Medical Device using a CPS approach provided an approach for smarterization of medical device using a CPS approach, a physiotherapy device, with real-time measurements and connectivity capabilities, meeting new medical device regulations. For this purpose, the B-Health IoT Box device was developed, which is responsible for collecting data from the sensors, processing this data, manage the trainings executed on the physiotherapy device and export the results in FHIR standard format.