

PhD Curricula - Blockchain and Distributed Ledger Technology

Curriculum 3: Health and well-being

The curriculum on "Health and well-Being" aims to advance in the study of blockchain and DLT in creating innovative and performing solutions to improve the trust between patients and healthcare organizations as well as among healthcare organizations every time data sharing is required. Being very sensitive, the sharing of health-related data requires the compliance with several norms and policies which can be defined at European, national, or even at organization level. In this context, Blockchain and DLT can be beneficial in providing trusted environments to monitor the actual respect of these norms and policies without requiring the building of a complex, and often centralized authority, in charge of checking the compliance and where also the patients can have a role.

In this curriculum, the adoption of blockchain and DLT will be investigated considering the different types and formats of data involved in clinical and research-trials related processes. In fact, the context of the "Health and well-being" domain includes data, data-at-rest, images, genomic data, unstructured data and the approaches to decide between on-chain off-chain data management to balance between the need for trust and the system performance cannot be defined in general but depends on the type of data considered. Moreover, the potential adoption of Blockchain and DLT will consider the connection with well-established protocols (e.g., HL7 in its new FHIR version and DICOM for diagnostic images) and common systems (e.g., PACS for managing images and CRF for setting experiments). Notably, the role of blockchain and DLT in improving the management of genomic data which involve the need to manage important artifacts with a significant size will be investigated. Finally, in conjunction with the usual and fundamental role of the ethic committee which must deliberate on the possibility to manage personal data, smart contracts can be studied to enact the policies in a more agile way.

Keywords:

- Healthcare services
- Hospital's data and automated management
- Healthcare data sharing
- Healthcare data protection
- Trust-based health environments
- Distributed Ledger Technology
- Electronic Health Records
- Privacy preserving data processing
- Ethics and Ethics Committee