

smartDONOR® - the app for blood donors.

smartDONOR® is a multi-sided platform for blood donors and organizations, which supports the blood transfusion system in achieving and maintaining the self-sufficiency based on voluntary, non-remunerated blood donation.

Voluntary, non-remunerated blood donation is essential for the sustainability of health systems worldwide: blood units save lives in emergency trauma care, transfusions are required to treat chronic diseases, blood units are used in pharmaceutical production. Blood can be stored for a maximum of 35-40 days, when refrigerated, so continuous supply is needed. And since donations are unpaid, the motivation, quality of service, accessibility and overall experience of the donors is essential for the system to thrive. As in every business, all this requires financing. However, the donor associations are significantly underinvested: these organizations operate only thanks to reimbursements from national health systems per one donation, which is insufficient to innovate, to revolutionize the sector and keep the pace of the digital era of e-Health.

smartDONOR® through web platform and mobile app, offers to blood donors and organizations a complete set of functionalities able to merge the aspects of information and socializing with the dynamics of promotion, scheduling and efficiency of blood collection management, making the activity of donors more efficient and aware, and supporting operators in optimizing the promotion of the culture of blood donation.

smartDONOR® is developed in compliance with the EU GDPR and US HIPAA regulations and thus ready to store and exchange medical data (blood-test results).

Thanks to INNOLABS H2020 project smartDONOR® developed functionalities which provide donors with access to their blood test results in compliance by design with the EU GDPR and US HIPAA regulations and completed Exploratory Data Analysis (EDA) as a proof-of-concept of donor's blood test results. Unsupervised machine learning (outlier detection, clustering) was carried out on hematological and biomarker data sets. Several models were created for regression and classification scenarios.

The EDA revealed clusters inside the data related to risk groups in patients (e.g. neutrophil-to-lymphocyte (NLR) and platelet-to-lymphocyte (PLR) ratios as predictive biomarkers of intracerebral haemorrhage (ICH), gastrointestinal (GI) cancers, or colorectal cancers (CRC) (as suggested by recent studies)) but also more complex correlations, e.g. predictive power of the data for several dependent variables, most notably: biological age, obesity, cardiovascular disease, stroke and diabetes.

In this way, smartDONOR® improves the performance of blood collection logistics, on the one hand, and proper user experience and service quality for the donors, on the other. This way, the solution helps to address contemporary demographics challenge of aging society, resulting in blood supply decrease while demand increases.