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Biography

Bernd Blobel, received a multi-disciplinary education, covering mathematics, physics, systems engineering, electronics, medicine, informatics and medical informatics, including habilitations in medicine and informatics. He was Head of the Institute for Biometrics and Medical Informatics at the University of Magdeburg, and then Head of the Health Telematics Project Group at the Fraunhofer IIS in Erlangen. Thereafter, he acted until his retirement as Head of the German National eHealth Competence Center as well as Head of the globally unique International Interdisciplinary PhD and Postdoc College at the University of Regensburg. He was leadingly involved in many countries health digitalization as well as electronic health record strategy. He was and is still engaged in international standardization at ISO, CEN, HL7, OMG, and IEEE etc. Furthermore, he still engaged in international higher education and member of several international academies.

Designing and Managing Knowledge-Based Intelligent and Ethical Health and Social Care Ecosystems

Abstract

Health and social care systems around the world undergo a transformation from phenomenological through evidence-based, person-centered, and personalized medicine to systems medicine, better characterized as personalized, preventive, predictive, participative precision medicine (5PM). 5PM considers the individual health status, conditions, genetic and genomic dispositions in personal, social, occupational, environmental and behavioral context. This requires communication and cooperation between actors from multiple domains including the patient, using their methodologies and languages in a highly dynamic and highly complex ecosystem for taking the right decisions and performing the correct process. Thereby, we have to advance from data focus to knowledge focus. The challenge is the understanding and the formal as well as consistent representation of the disciplines and practices involved in the business system in question such as women's health specialties, physiology, pathology, biophysics and biochemistry, pharmacology, imaging, but also legal and ethical aspects. This requires the formalization and management of multi-domain knowledge and individual skills of all actors involved in the real-world business processes as well as the development process of appropriate solutions supported by technologies. In the first step, we have to formally and architecturally represent the ecosystem with its components, functions and relationships, including their composition/decomposition. This must be done for each of the involved domains. This system can thereafter be transformed into ICT solutions following the development process according to the ISO/IEC 10746 Reference Model Open Distributed Processing. The outcome is a system-oriented, architecture centric, ontology-based, policy-driven approach meanwhile standardized as ISO 23903, mandatory in all projects addressing more than just one domains, and meanwhile deployed in many SDOs such as ISO, CEN, IEC, OMG, IEEE, HL7, etc. A specific challenge is the representation of the different aspects and viewpoint through languages with appropriate grammar. The formal representation of any ecosystem and its development process including examples of practical deployment of the approach are presented in detail. This includes correct systems and standards integration and interoperability solutions.