Special track

eHealth: Patient-centric eHealth Services

Introduction

Chair: Professor Dimitar Tcharaktchiev, MD/PhD: dimitardt@gmail.com
Medical University, Sofia, Bulgaria

Coordinator: Professor Evgeniy Krastev, PhD: eck@fmi.uni-sofia.bg
Faculty of Mathematics and Informatics, Sofia University St. Kliment Ohridski, Bulgaria
Short CV

Dimitar Tcharaktchiev
Professor, MD/PhD at the Medical University, Sofia, Bulgaria

Scientific areas of interest:
- Clinical Information Systems
- eHealth
- Telemedicine
- Clinical and Epidemiological Registries
- Big Data
- Clinical Decision Support Systems

Memberships and awards:
- Member of Bulgarian Institute for Standardization
- Bulgarian representative in CEN TC251
- Member of Bulgarian Medical Association
- Member of Bulgarian Union of Scientists
- Chairman of Association ProRec - Bulgaria
- Rolf Hansen Memorial Award (2011)
Short CV

Evgeniy Krastev:
- Professor, PhD in Mathematics and Computer Science
- at Sofia University St. Kliment Ohridsky, Faculty of Mathematics and Informatics
- ORCID 0000-0001-8740-5497
- IEEE member number: 93376282

**Scientific areas of interest:**
- Robotics and Mechatronics,
- Object Oriented Programming,
- Health Informatics
- Database Management
- System Analysis and Design;
- Information System development
Special track
eHealth: Patient-centric eHealth Services

Main Topics


3. Modelling and Management of ePrescriptions on openEHR platform in Bulgarian eHealth.

4. Picture Archiving and Communication System.

5. Future Challenges.
1. Semantic Interoperability of Medical Information Systems

Short description

The implementation of European standards in Health informatics remains a true challenge nowadays. This research area is rather unexplored in the existing literature. There is rather limited information about the implementation of such standards in eHealth services. Therefore research reports like those reported in this paper represent valuable contribution in this special track.

Main results:

1. Clinical data at the University Specialized Hospital for Active Treatment of Endocrinology (USHATE) is transferred between the Hospital Information System (HIS) and the Scientific Repositories by preserving the clinical context and the Scientific Repositories

2. Several medico-administrative, clinical and laboratory data can be transferred from the Hospital Information System to the Register of rare endocrine diseases, keeping the context of their registration, structuring the measured results, used nomenclatures and methods in archetype concepts satisfying the Archetype Object Model of ENISO13606

3. The Register of rare endocrine diseases provides mapping between ICD-10 codes, respective ORPHACodes and Orphanet nomenclature of rare diseases.
2. Management of Clinical Concepts in Bulgarian Healthcare

Short description

Clinical path are used in national healthcare to report the procedures and medical services used in patient-treatment. The exchange of such clinical documents in most cases is impossible due to the usage of incompatible and heterogeneous health information reference models to represent data. The proposed methodology and its implementation for management of typical clinical concepts in the scope of the Bulgarian healthcare by means of openEHR archetypes represent an important research contribution in providing patient-centric eHealth services.

Main results:

1. Analysis of the current state of IT systems in the Bulgarian healthcare with emphasis – problems related to inefficient data exchange.

2. Search for world best practices, specifications and standards providing interoperability.

3. Development of multi-layered web-based software, providing automatic translation of clinical data from the Bulgarian healthcare to openEHR specifications.
3. Modelling and Management of ePrescriptions

Short description

The ePrescription service is a typical patient-centric service with many benefits to all the participants involved in the business process starting with the creation the prescription and the dispensation of the prescribed medicinal product. The methodology for modelling and management of ePrescriptions using openEHR specifications is insufficiently explored. Therefore, the proposed methodology and results from computer experiments of its software implementation in a realistic use case can be considered as important research contribution in this special track.

Tasks:
1. Analysis of W3C XML schema definitions used to report claims of pharmacies to the National Health Insurance Fund (NHIF) for reimbursed drugs.
2. Design of an openEHR archetype and corresponding operative template to meet the requirements for electronic health record for drug therapy that is compatible with NHIF requirements.
3. Installation and configuration of openEHR Server instance and deploy it in production environment.
4. Load the created operational template into the running instance of EHRServer and create basic health records for patient identifiers.
5. Development of a prototype client application / module for creating and retrieving an electronic health record for drug therapy in accordance with the developed operational template.

Evgeniy Krustev, Sofia University St. Kliment Ohridsky
4. Picture Archiving and Communication System (PACS)

Short description

PACS is a system software with a high degree of complexity and connectivity of the software solution. Such systems are essential to most patient-centric eHealth services and usually it is very expensive to acquire. A paper in this special track reports results obtained in the development and testing of a new PACS in a hospital’s infrastructure.

Business constraints:
✓ Product descriptions are advertising-oriented.
✓ Each country has specific regulatory requirements related to the storage and use of medical data.

Key characteristics of the solution:
✓ satisfies the principal goals and constraints.
✓ satisfies the business objectives and technical constraints.

Primary and extended dynamic testing:
✓ use a testbed comparable to alpha testing.
✓ use a testbed of a semi-natural model of the hospital’s infrastructure.
✓ usability testing, interface testing, fault tolerance testing, recovery testing, and some types of performance testing are added.
3.3 Future Challenges

1. Current trends in eHealth are characterized by a wide spread of applications using Artificial intelligence and machine learning, technologies and methods that provide confidentiality, security and transparency in using personal data. A major challenge in implementing such applications is achieving semantic interoperability among the systems and devices that generate and exchange clinical data in electronic format.

2. Continuity of care is a hallmark for the quality of health services. It is strongly related to the implementation in the development of Health Information Systems of logical models based on internationally accepted standards in health informatics like EN 13606 and openEHR.

3. Health organizations accumulate and operate with large amounts of clinical documents represented in proprietary legacy and incompatible logical models. The computer-aided transformation of data in such documents by preserving their semantic context into internationally accepted standards in health informatics is in very early stage of research and application development.

4. The exchange in electronic format of clinical documents at local and international level becomes a necessity in modern times marked with intensive and free movement of people. The implementation of international standards in health informatics in the development of services for cross-border exchange of essential medical data about Patient Summary and ePrescriptions remains a huge challenge.

5. Finally, there is insufficient number of specialists in eHealth qualified to implement international standards in health informatics in patient-centric services is a challenge. This appears to be a huge problem in resolving all the above challenges in addition to the difficulties in representing clinical data in terms of international nomenclatures and coding systems as well as aligning national legislation with contemporary eHealth requirements.
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Thank you for the attention!

Questions?

Comments?

Professor Evgeniy Krastev, PhD
Faculty of Mathematics and Informatics
Sofia University St. Kliment Ohridsky
Sofia, Bulgaria

eck@fmi.uni-sofia.bg
https://ehealth.fmi.uni-sofia.bg