

# ICTRS 2015

## Fourth International Conference on **Telecommunications and Remote Sensing**

Including a Special Session on  
**e-Health Services and Technologies (EHST)**



# Proceedings

*Rhodes, Greece • 17-18 September 2015*

Organized by:



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AMAKOTA

BULATSA



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# Bulgarian E-Health Overview

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**Abstract:** The paper presents: (1) the strategy of the World Health Organization and ways of delivering E-Health; (2) discusses the EU Health 2020 policy, EU support, EU projects, goals in the field of E-Health; (3) Bulgarian National Health Strategy (2014-2020), integration and connectivity in healthcare through the national health information system and real access to patient information about their own health; Bulgarian E-Health electronic medical systems, Bulgaria E-Health foundation.

## 1 INTRODUCTION

According to the World Health Organization (WHO) (World Health Organization, 2015) E-Health is the transfer of health resources and health care by electronic means. It encompasses three main areas:

- The delivery of health information to health professionals and health consumers, through the Internet and telecommunications.
- Using the power of information technology and e-commerce to improve public health services, e.g. through the education and training of health workers.
- The use of e-commerce and e-business practices in health systems management.

The benefits of E-Health for patients include: easier access, better quality, speed and convenience, awareness and participation in control; and for doctors: reducing the administrative burden, eliminating unnecessary documentation, timely and ease of access information for finding evidence-based solutions, easier communication, ways to plan activities more effectively.

The Bulgarian E-Health systems should:

- Improve the quality of information services for all sides involved in health care;
- Define health information standards, regulating the information interaction among all participants in the healthcare process;

- Provide the information necessary for monitoring the health of the population at different levels and the quality of medical services;
- Provide information for planning and control of financial flows in healthcare;
- Attain unification with health information systems of the European Union and WHO.

The paper is organized as follows: Chapter 2 presents the strategy of WHO for E-Health. Chapter 3 discusses the EU E-Health plans. The Bulgarian Ministry of Health E-Health activities are presented in chapter 4. Chapter 5 describes the current state and the future of the Bulgarian E-Health electronic medical systems. The paper ends with conclusions.

## 2 THE WORLD HEALTH ORGANIZATION STRATEGY

The World Health Organization published in 2012 its National E-Health Strategy Toolkit (World Health Organization and International Telecommunication Union, 2012). It reflects the growing impact that E-Health is bringing to the delivery of health care around the world today, and how it is making health systems more efficient and more responsive to people's needs and expectations. It is divided into three parts: National E-Health vision, National E-Health action plan and National E-Health monitoring and evaluation. WHO's key undertaking within E-

Health is to provide independent advice and assistance to countries towards the long-term development of sustainable national E-Health solutions in relation to strengthening health systems performance and the capacity for countries to gather and analyse health information. WHO delivers E-Health in 3 ways: (1) As a knowledge-broker and facilitator between nations and the International Community at large; (2) By developing and sharing best practices and standards precipitated from successful E-Health implementations; (3) By working directly with Ministries of Health to address their technical and strategic needs for E-Health and Health Information.

### **3 EUROPEAN COMMISSION E-HEALTH PLANS**

The European Commission published in 2012 its E-Health Action Plan 2012-2020 - Innovative healthcare for the 21st century (European Commission, 2012). The vision of the Action Plan is to utilize and develop E-Health to address several of the most pressing health and health systems challenges.

Health 2020 is the new European health policy framework. It aims to support action across government and society to: significantly improve the health and well-being of populations, reduce health inequalities, strengthen public health and ensure people-centred health systems that are universal, equitable, sustainable and of high quality. It has two strategic objectives, constructed around equity, gender and human rights and improved governance for health.

European Commission support can be divided into three main areas: co-financing of projects, support to awareness-raising events (in particular to the annual High-Level Presidency E-Health conferences) and running structures for awareness and networking building, best practice sharing and policy development.

The goals of the main EU E-Health projects are to:

- Test and demonstrate new models and tools for health and care delivery;
- Support the translation of findings into the clinic and other health and care settings to: improve health outcomes, reduce health inequalities, and promote active and healthy ageing.

Some of the EU projects are connected with the overview of the national laws on electronic health records in the EU Member States (European Commission, 2013, Overview of the national laws on

electronic health records in the EU Member States National Report for Bulgaria).

Common E-Health challenges observed in Europe are:

- Ownership and governance of E-Health, developing and delivering on national E-Health strategies and managing the burden of ongoing system development and maintenance;
- Developing and adopting appropriate legislation to allow for E-Health;
- Ensuring security, privacy, identity management and ethical issues;
- Workforce issues: education, awareness and retraining;
- Acceptance of solutions by health professionals;
- Regionalization (within country) can be both a strength and a weakness;
- Digital literacy issues are contributing to a delay in E-Health adoption.

### **4 THE BULGARIAN MINISTRY OF HEALTH E-HEALTH ACTIVITIES**

The Bulgarian Ministry of Health published in 2013 a National Health Strategy (2014-2020) (The Bulgarian Ministry of Health, 2013). It includes the development of E-Health as an essential tool for ensuring the effective functioning of the health system. A National Health Information System (NHIS) will be developed to provide public access through an electronic identifier managing health records, electronic prescription, etc. This will take place through the following steps:

- Development of mandatory standards for health information and statistics;
- Development of policies for security and interoperability of the healthcare information systems;
- Establishment of a national health information system and ensuring public access to the system through an electronic ID.

Some of the main system functionality will allow:

- The use of a secure user interface to exchange information in real time between physicians, patients, laboratories, insurance company;
- Management of the electronic health record of the patient;
- Providing information to the public and health education;
- Distribution of telemedicine services in diagnosis, treatment and surgery.

Development of E-Health is a government priority and this is clearly indicated in the Government Programme for sustainable development of the Republic of Bulgaria (Government Programme for sustainable development of the Republic of Bulgaria 2015).

The main EU recommendations for including E-Health in Bulgaria are:

- Need of a well-established health strategy, as a precondition for access to the structural funds (ex-ante conditionality criteria);
- Need of an action plan of this strategy before planning the investments needed;
- Adoption of EU standards for interoperability should guide the investments in E-Health;
- Continuous and strong involvement in EU initiatives, such as joint actions and the eHealth Network.

In E-Health, a reform facilitator final report on Health Financing Diagnostic and Review of Envisaged Reforms (Final report, 2015) is written that Bulgaria is rich in technology resources, but it seems that the country is now falling behind its peers. The Ministry of Health is well placed to play a significant role in encouraging cooperation among all health stakeholders, but before that it must resolve the fundamental issue of the National Health Insurance Fund system.

Expected results of applying the plan are: Integration and connectivity in healthcare through a national health information system and real access to patient information about their own health.

There is also a non-profit, non-governmental organization functioning in Bulgaria - The Bulgaria E-Health Foundation. It was established with the purpose of boosting the development of E-Health on national level as part of the electronic government of the Republic of Bulgaria. The necessity of speeding up the health reform in Bulgaria requires the development of electronic healthcare as a cornerstone in our health system. In this process the Foundation works together with all participants and interested parties in the healthcare process – the Ministry of Healthcare, the National Health Insurance Fund, private health insurance funds, hospitals, GPs, pharmacies, laboratories, medical doctors and patients (E-Health Bulgaria Foundation, 2015).

## **5 BULGARIAN E-HEALTH ELECTRONIC MEDICAL SYSTEMS**

An essential tool for ensuring the effective functioning of the health system is the integration and

connectivity of healthcare by building a national health information system and ensuring public access to the system through an electronic identifier. A unified information system of health care is the basis on the development of which E-Health will be built with its main components: electronic health records, electronic prescription, electronic referral, electronic portal, etc. Its implementation allows for more online administrative and health services sector activities, providing access to information about the patient's own health, improving relations between different levels of the system, improving the quality of medical services and making the spending of public funds for health care more effective.

The Bulgarian E-Health electronic medical system has to include information about:

- Patients – to improve treatment, thanks to evidence-based medicine and provide a way to involve patients in decisions about their health;
- Medical and health professionals - for quick and easy access to information, diagnosis and for performing complex remote interventions, as well as access to specialized education and training resources; with the support of medical research, effective management and dissemination of medical knowledge;
- Managing the health care system - to improve access and dissemination of best practices for planning and management of healthcare for the benefit of patients and society;
- Civil society - in order to better health education, a healthy lifestyle, prevention, information, health resources and opportunities for the health system to be able to influence the management of the health system at the local and national level.

The Bulgarian Ministry of Health needs systems in health policy planning including:

- “What-if” systems that model different policy parameters and attempt to compare results;
- Simulation systems that similarly provide guidance on policy decisions based on the simulation of random epidemiological or environmental or macroeconomic events;
- Geographic Information Systems that can create a full “health map” of the country;
- Systems aimed at monitoring and enforcing quality standards across the health sector;
- Budgeting systems, National Health Accounts analytic systems and accounting systems.

The structure of the current National Health Information System is given in Figure 1. Processing of the claims includes: electronic files submitted by hand or by e-mail. Different databases are used by regions and types of claims. There is one point missing, a uniform mechanism and database for processing, approval and storage of all claims. There is no control of funds and optimizing payments

software. The system has two cores, an Enterprise Resource Planning (ERP) core (Core 1) for managing the financials, and Core 2, which provides the centralized claims-processing step at the central site in Sofia. Hospital claims, the largest per-unit cost claims must now bypass the claims adjudication system altogether and proceed to the payment module with seemingly little scrutiny. Some of the regional modules used in processing claims are given in Figure 2.

The current problems of using NHIS (P. Moskov, 2015) could be summarized as:

- Lack of a comprehensive information picture of the activities in the healthcare system;
- No mandatory application of health information standards;
- No statistically valid planning;
- No quantitative rational control of the quality and effectiveness of medical activities.

The following steps will be taken in the next five years:

- Creation of an Electronic Health Record for each Bulgarian citizen;
- Creation of a National Health Information System and its infrastructure (portal data center, electronic identification) available to all entities of the health system (natural and legal, public and private);
- Creation of electronic prescriptions;

- Construction of health and medical standards;
- Construction of pharmacy-therapeutic practices;
- Development of a unified medical ontological database;
- Creation of a Statistical Center;
- Further development of statistical standards;
- Creation of sets of metrics for quality management.

Work will be based on the following principles:

- Leading role of the state;
- Use of existing initiatives and systems;
- Providing a gradual process of construction in accordance with our long-term vision;
- Protection of existing investments;
- Security and access to regulated information in accordance with the regulations;
- Mandatory use of health information standards;
- Uniform requirements and equal access to information;
- Broad consensus and involvement of all stakeholders.

The steps in the next five years are given in Figure 3.

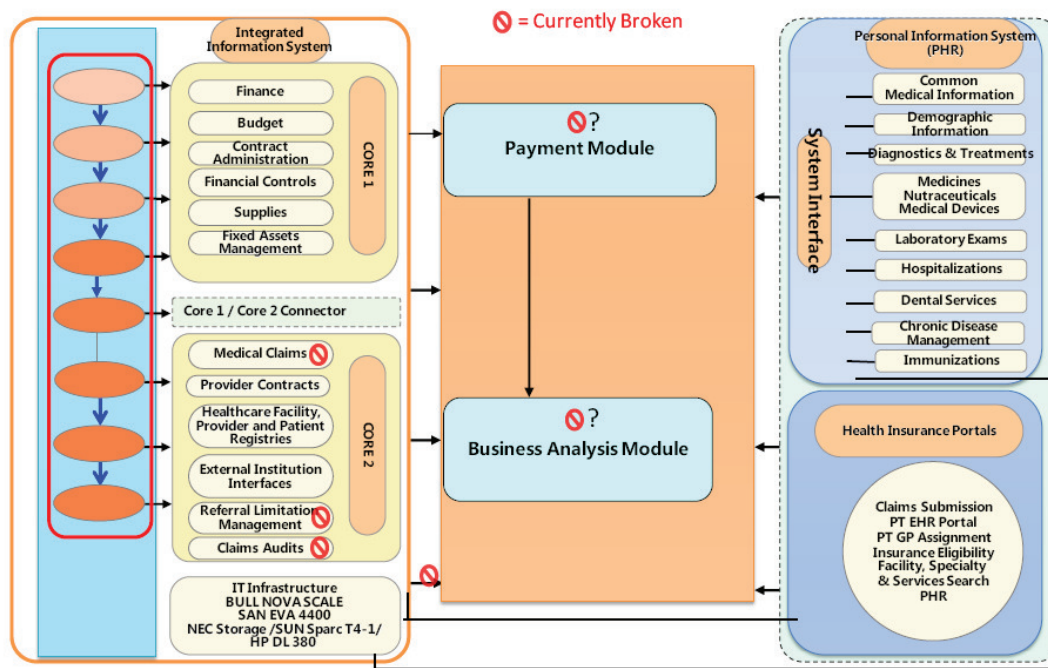


Figure 1: Main modules of the current National Health Information System

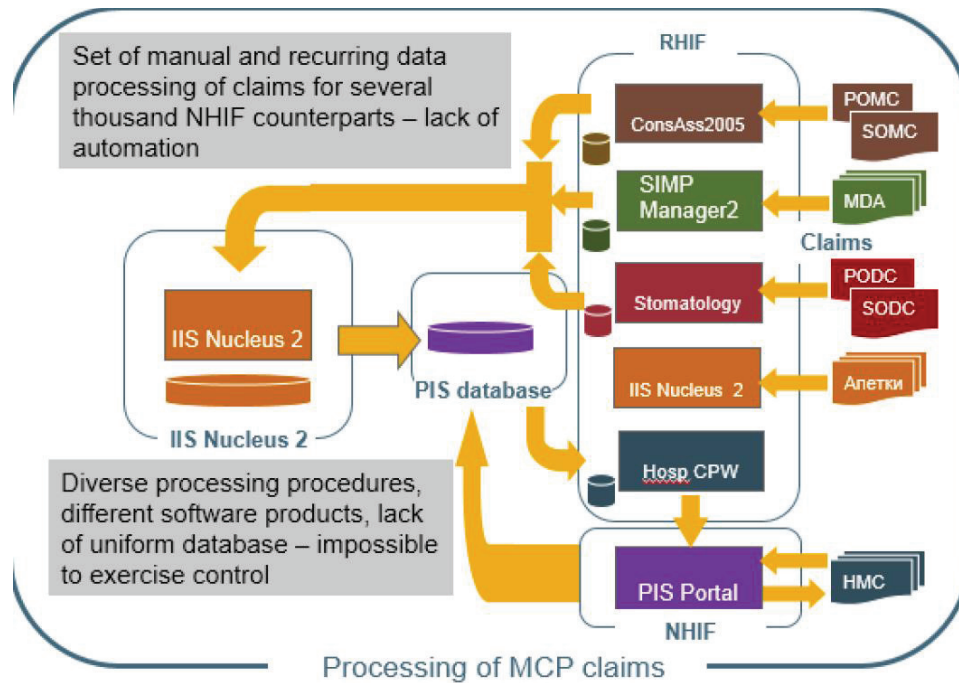


Figure 2: Regional modules of the current National Health Information System

2015	2016	2017	2018	2019	2020
Ministry of Health Database 1		Ministry of Health Database 2		National E-Health Portal	
Medical Nomenclatures		National Statistics Centre		Medical Ontologies	
Medical Standards		Standard Information System 1		Standard Information System 2	
Medical Good Practices		Medical Records 1		Medical Records 2	
Health Legislation		Medical Administrative Services 1		Medical Administrative Services 2	
Health System Analysis		Medical Software Certification		Telemedicine	
NHIS - core1 + E-medical Records + E-Prescription		NHIS - core 2		NHIS - core 3	
Technical Support 1		Technical Support 2		Technical Support 3	
Human Relation 1		Human Relation 2		Human Relation 3	
Project Management 1		Project Management 2		Project Management 3	

Figure 3: Steps to be taken in the next five years for building the new National Health Information System



## 6 CONCLUSIONS

WHO has both a normative and a supportive role to play in the member states in the field of E-Health. WHO and the European Commission are committed to bringing together representatives of all member states to advocate for the development of a national E-Health strategy, the adoption of standards for interoperability and promoting the implementation of E-Health with the aim of attaining Universal Health Coverage.

The Bulgarian Ministry of Health is working to bring E-Health to citizens. E-Health is essential to an efficient and sustainable health system. Bulgaria needs interoperable systems to attain E-Health solutions.

At present in Bulgaria there exist hospital information systems, software for providers of outpatient care, small databases for different medical practices, an NHIF system at different centres and agencies.

There is no single system at the moment that unifies and enables communication between different information systems and databases. There is an action plan and a road map for building a National E-Health system over the next five years.

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