Development of eHealth in Slovenia - Critical Issues and Future Directions

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ABSTRACT

Although the basic informatization of the health care system was established relatively early, Slovenia still does not have an interoperable and comprehensive health information system (HIS). Fragmentation of information systems (IS) and their limited interoperability significantly compromise further development of the health care system and adversely affect the quality of health care services. Overcoming the aforementioned challenges requires the progressive implementation of eHealth project, which is one of the key long-term goals of the Slovenian public sector. The main objective of eHealth is the comprehensive integration of distributed IS and connection of a widespread network of stakeholders within the health care system. The paper presents the review of eHealth projects in Slovenia, Austria and Denmark, and provides a comparative analysis of the eHealth development in designated countries. Focusing on the Slovenian experience, the paper summarizes the main deficiencies in the current eHealth settings, and finally outlines a set of applicable guidelines for an effective development and implementation of highly intricate and complex eHealth project.

Key words: eHealth in Slovenia, Austria and Denmark, infrastructure components, comparative analysis, deficiencies and barriers, development guidelines

JEL: I15, I18, D8, D81

1   Introduction

Slovenian health care system has been facing serious structural problems in recent years. Due to objective circumstances (Ministry of Health, 2011) these problems cannot be avoided and will require fundamental changes in the current health care arrangements. The health care system reform is becoming a social imperative, which calls for innovative approach in the next years. One of the fundamental tools that would allow for successful and effective tackling of challenges facing the Slovenian health care system is the comprehensive informatization (Ministry of Health, 2005 and 2008) representing one of the key long-term goals of public sector. Experience of the most developed countries shows that successful implementation of health care informatization projects is of immense strategic importance for further development of the health care system (Chaudry et al., 2006; European Commission, 2008

and 2011) but also displays important implications for the increase in social welfare (Bardhan & Thouin, 2013; WHO, 2009), economic growth (Goldzweig et al., 2009; Valeri et al., 2010) and development of information society (Nyamtema, 2010; Walsham, 2013). Majority of the existing information systems (IS) in Slovenian health care have been developed within individual health care organizations and are designed specifically to meet their own needs (Ministry of Health, 2008) while they are not adequately interoperable and do not provide complete, relevant and timely information (Ministry of Health, 2005). The already initiated national project of health care system informatization from 2005, known as eHealth (Ministry of Health, 2005) should be able to integrate all fragmented IS and offer a complete solution benefitting all interested parties. eHealth entails the inclusion of stakeholders into the functional network, reconstruction of health care system business model as well as integration and harmonization of many information subsystems at different levels (Haux, 2010; Iveroth at al., 2013). Informatization of the Slovenian health care system should provide opportunities for high quality and professional work with patients and long-term development, whereas relevant and reliable economic, administrative and medical data provided by eHealth should facilitate better quality planning, control and management of individual health care organizations and health care system in general (Ministry of Health, 2005 and 2008).

The main objectives of the paper comprise the comparative assessment of the eHealth progress in an international context, identification and analysis of the key eHealth components and success factors, and production of applicable guidelines for further development and implementation of eHealth in Slovenia. In achieving the aforementioned objectives we have been focusing primarily on the following interrelated research questions:

1. Review of the eHealth projects and related strategies in Slovenia, Austria and Denmark.
2. Analysis of the development of eHealth projects in Slovenia, Austria and Denmark.
3. Identification of the main deficiencies in the current setting of eHealth in Slovenia and provision of guidelines for further development.

Methodologically speaking, the paper represents a comparative analysis of the eHealth development in Slovenia, Austria and Denmark. The comparative framework was established on the basis of document analysis and information retrieval focusing on in-depth investigation of various electronic and written sources instating eHealth projects in three countries, and ultimately facilitating the identification and characterization of the most important infrastructure components of eHealth. Selection of the research methods was adapted to the research field (Patton, 1990; Yin, 2009), given the complexity and scope of eHealth initiatives.

Following the introduction, the second section of the paper presents the state of the art in the field and conceptual implications of eHealth. The third section outlines eHealth projects in Slovenia, Austria and Denmark, provides a comparative analysis of the eHealth development in selected countries, and finally identifies the main deficiencies related to eHealth development in Slovenia. Lessons learned and guidelines for more effective further development and implementation of eHealth project in Slovenia are presented in the fourth section. The last section contains the review of the overall comparative analysis, discussion on its practical applicability, limitations and future work, and concludes by submitting final arguments and observations regarding the research results, and future development of eHealth in Slovenia.

2   State of the Art

Considering the multifaceted nature of health care systems and related IS, the body of knowledge in the field is relatively extensive, as well as the number of various definitions depicting the concept of eHealth. Gaining international recognition in the last decade (Black et al., 2011; Gillies & Howard, 2011), definitions of eHealth are normally derived from the classifications of IS with the addition of certain features which are associated with the specific nature of health care services and health care system status, being essentially one of the most important segments of the public sector. While some definitions of eHealth are rather general, others are more narrowly focused, converging on individual aspects of information and communication technology (ICT) and health care interaction.

Eysenbach (2001) is referring to the term of eHealth as a general »buzzword«, which is used to characterize virtually everything related to computers and medicine, and interprets e-health as an emerging field in the intersection of internet-related medical informatics, public health and business. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using ICT. Marconi (2002) defines eHealth as the application of internet and other related technologies in the health care industry to improve the access, efficiency, effectiveness, and quality of clinical and business processes utilized by health care organizations, practitioners, patients, and consumers in an effort to improve the health status of patients. According to Healthcare Information and Management Systems Society (HIMSS, 2003), being one of the leading authorities in the field, eHealth represents a patient-focused framework including various dimensions such as: delivery of key information to health care partners, provision of health information delivery services, facilitation of interaction between providers and patients, acceleration of the integration of health care industry-related business processes, both local and remote access to health care information, support for employers and employees, payers and providers. And conversely, there are a number of arbitrary

and ad hoc definitions which are more narrowly targeted and focused on individual aspects of the eHealth research. They are outlining the concept of eHealth as the process of providing health care via electronic means, in particular over the internet, including web-based applications, cross-sectoral transfer of patient-related data, monitoring of health parameters (telemedicine solutions), and interaction with health care providers (Alpay et al., 2010; Dedding et al., 2011; Gibbons et al., 2011). Extrapolating from different definitions, eHealth concept can be generally regarded as a comprehensive mechanism based on the internet and other related ICTs, expected to facilitate integration of all stakeholders and evidence-based decision making at all levels, in order to improve quality of health care, administrative and managerial processes as well as related outcomes in the health care system.

As noticed by several authors (Ahern et al., 2006; ITU, 2008; Oh et al., 2005) the term eHealth has a highly variable and interchangeable usage, which significantly complicates its substantive characterization and distinction from other related concepts. In addition, there are hardly any extensive empirical studies systematically identifying and analyzing the general implications of eHealth projects on the health care system transformation, its impacts on public health and public finance aspects, and issues related to the long-term development of the health care systems (Bardhan & Thouin, 2013; Murray et al., 2011). Majority of the studies in the field are usually focused on the selected aspect of eHealth, its implications on certain health care service/product or particular institution within the health care system. The latter reasons considerably hinder the research of the very concept of eHealth on the one hand (Gillies & Howard, 2011; Nykänen et al., 2011), and, on the other hand, they prevent the evaluation of the actual effects of eHealth on business and health outcomes of the health care system.

2.1   eHealth Implications

Regardless of their definition and research perspective, virtually all authors emphasize that the main goal of eHealth should be the contribution to a high--quality, efficient patient care and effective performance of the health care system (Haux, 2006; Li et al., 2012; Trudel et al., 2012; etc.). eHealth could empower patients and help in exceeding information asymmetry between main stakeholders while ensuring that reliable and timely health care information is available for operational and strategic decision making, providing better health care services and enhancing public health (Leung, 2012). eHealth systems and services combined with organizational changes, process reengineering and development of new skills can act as key enabling tools facilitating considerable enhancements in access to care, quality of care, as well as efficiency and productivity (Arndt & Bigelow, 2009; Hunter, 2011) of the health care system. Implementation of eHealth is expected to reduce costs and improve productivity in such areas as 1) billing and record-keeping, 2) reduction in medical error, 3) alleviation of unnecessary care, and 4) savings

achieved by business-to-business e-commerce (Stroetman, 2007; Vest et al., 2012).

Given the innate complex nature of the health care activities and specificity of the health care-related IS, there are a reasonable number of requirements, constraints and risks associated with the implementation of eHealth project. The quality introduction and performance of eHealth depend not only on technical determinants such as ICT infrastructure, data quality, system design, or adequate use of ICT (Haux, 2010; Lucas, 2008). Other factors are also involved, such as 1) organizational policies and environmental determinants that relate to the information culture within the country context (Lluch, 2011; Piette et al., 2012), the structure of eHealth (Jensen, 2013; Winter et al., 2007), the roles and responsibilities of the different actors and the available resources for eHealth (Bush et al., 2009; Murray et al., 2011), and 2) the behavioral determinants such as the knowledge and skills, attitudes, values, and motivation of those involved in the production, collection, collation, analysis, and dissemination of information (Walker, 2005; Jaana et al., 2011).

Attributable to these highly challenging preconditions, practice reveals that planning, development and implementation of eHealth are riddled with major problems, even in countries with relatively well-developed health care systems (Lapointe et al., 2011; Protti, 2007). Furthermore, the information generated and retrieved from inadequately conceptualized eHealth is often not helpful for health care management decision-making (Kaye et al., 2010), because information is not applicably clustered; it is frequently disparate with predefined indicators, while modalities and jurisdiction on management and transaction of information can be ambiguous and unrelated to priority tasks and functions of health care professionals (Heeks, 2006; Ibrahim et al., 2013). In other words, poorly defined and unstructured eHealth projects have a tendency to be data and information driven, instead of action driven (Karsh et al., 2010). In order to avoid these threats, the entire eHealth project, including its long-term and wide-ranging implications, must be well thought out, while its contextual role and functions within the health care system must be clearly defined (Haux et al., 2008; Kanjo, 2011), yet flexible and adaptable to requirements and continuous changes in health care ecosystem and broader social environment.

3   eHealth in Slovenia, Austria and Denmark

The section presents the review of eHealth strategies and related documents, and provides a summary of the up-to-date development of eHealth projects in Slovenia, Austria and Denmark.

3.1   eHealth in Slovenia

Ministry of Health has been dealing with the informatization of Slovenian health care system for almost two decades. eHealth project from 2005 in its

latest form consists of 17 sub-projects aiming at extensive renewal and integration of information and communication systems in health care domain. Strategic objectives within the eHealth strategy should be implemented by the year 2023 facilitating fully integrated national IS enabling monitoring of the on-going treatments and related costs, faster access to medical data, medical services as well as cost evaluation, online ordering and coordination of waiting lists, increase of efficiency and transparency of the health care system and optimization of the business processes taking place in health care institutions (Ministry of Health, 2005 and 2008). Based on the Strategy for informatization of the Slovenian health care system 2005–2010 (Ministry of Health, 2005) and the Resolution on the National Health Care Plan for the period 2008–2013 (Ministry of Health, 2008), all activities in the field of Slovenian health care system informatization are aiming at realization of eHealth, whereas summary of its development goals is presented below:

1. The establishment of basic ICT infrastructure including: network used for communication and data exchange, Diagnosis Related Groups (DRG) and standardized definitions of health and social data required for development and management of Electronic Health Records (EHR) and e-prescription as well as improvement of the health care Smart card functionalities (Smart card allows access to medical data containing information on: the cardholder, the person liable for health insurance contribution, compulsory health insurance, voluntary health insurance, selected personal physician and General Practitioner (GP), issued medication, issued prosthetic equipment, potential organ and tissue donation for transplantation etc. After all functionalities of eHealth are implemented, smart card will allow all users to remotely access to their own health data via Personal Health Record – PHR). Currently, EHR content is still not defined explicitly, while its structure comprises free text, preventing its full exploitation. Existing diagnosis as well as medical procedures are standardized and structured according to ICD 10 AM[1] classification, whereas EDIFACT[2], HL7[3] and XML[4] are the current data standards for transfer of messages.

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1 International Statistical Classification of Diseases and Related Health Problems (ICD) is a medical classification list developed by the WHO. It codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases (WHO, 2012).

2 Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) is the international standard developed under the United Nations. It comprises a set of internationally agreed standards, directories, and guidelines for the electronic interchange of structured data between independent computerized information systems (UN, 2012).

3 Health Level Seven (HL7) is a set of international healthcare informatics interoperability standards developed by the Health Level Seven International. HL7 network provides a framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information (HL7, 2012).

4 Extensible Markup Language (XML) is a markup language that defines a set of rules and standards for encoding documents in a format that is both human-readable and machine-readable. It is developed by the World Wide Web Consortium (W3C) (WRC, 2012).

2. Integration and merging health and social IS into a national HIS and establishing a central, unified health information portal that will allow all stakeholders within the health care system secure and reliable exchange of data, execution of electronic services as well as standardized and transparent information and interoperability with similar systems in the European Union (EU).

3. Introduction of e-business as standard way of conducting operations and processes in the Slovenian health care system and promoting and encouraging the use of eHealth applications by all health care system stakeholders.

eHealth project is thus divided into three substantially separate, yet related areas. The first area is the establishment of a national IS, comprised of Health Network (hNET), a health portal (hAOP) and EHR. The second area represents the establishment and operation of Center for health care informatics, undertaking the central role in governing of IS. This area also includes upgrading and maintenance activities of the entire project after its completion. The third area will enable the improvement of health care processes, access to health care services as well as education and training of target groups. Although the eHealth project is still deep in the implementation phase, the Figure 1 presents the projected infrastructure of eHealth, which should become fully operational sometime after 2020 (Ministry of Health, 2005).

The implications of eHealth will presumably be twofold. First, significant changes can be expected in the field of informing, empowerment and inclusion of patients in the health care process, and second, well-designed eHealth should facilitate timely access to relevant data and information and consequently initiate better supported decision-making at all health care, administrative and management levels. According to project objectives, the fully functional version of eHealth should provide standardized bi-directional connections between the designated entities of the health care system, network synergies and substantial improvements in information and resource flows. Nevertheless, despite ambitious eHealth strategy and objectives, most of the project goals presented above, have remained unfulfilled. Namely, the current infrastructure of eHealth includes components facilitating only a few peripheral functionalities (Smart card, Professional card), which do not yield tangible benefits neither for patients nor for health care workers and health care system managers. Due to leadership issues and lack of coordination as well as financial restrictions and technical problems, the eHealth development has stagnated in the recent period on almost all key areas, while the main project deliverables in the form of infrastructure building blocks have not reached the desired level of development according to the schedule. Consequently, the current infrastructure of the Slovenian eHealth is nonfunctional and causes time and resource losses.

Figure 1: Planned infrastructure of eHealth in Slovenia
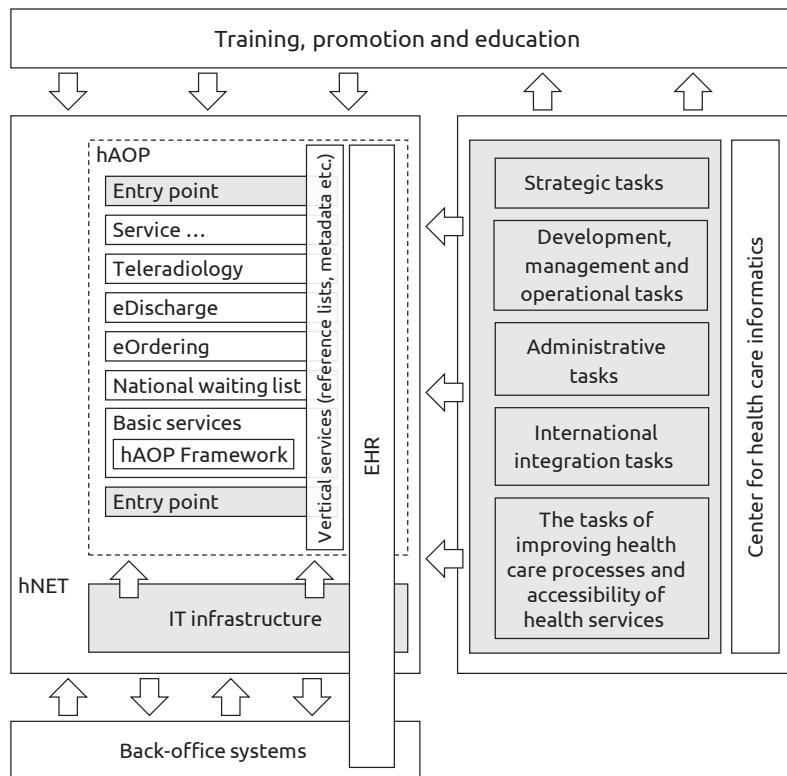

3.2 eHealth in Austria

Development of eHealth in Austria has been founded on the eGovernment Act from 2004 (Government of Austria, 2004) and the Health Care Reform Act from 2005 (Government of Austria, 2005), including the Health Telematics Law (Government of Austria, 2005), which focuses on the secure exchange of medical data. The Health Care Reform Act emphasizes the role of ICT in the future development of Austrian health care system and outlines the informatization of the health care system as one of the public sector priorities (Government of Austria, 2005). The main coordinating body responsible for promoting the use of ICT and mechanisms for planning, financing and management of informatization projects is the Ministry of Health (Bundesministerium für Gesundheit). Strategic framework for the health care system reform has defined eHealth as a set of business models and information tools, which should provide improved health care and health care system performance in general while facilitating effective implementation of the priorities listed in the strategic documents from the field. In accordance with the objectives of the i2010 initiative and some other documents, issued by the European Com-

mission (European Commission, 2005 and 2007; Pfeiffer et al., 2010), Austria has established the Information Society Development Program, comprising activities for the harmonization of projects and mechanisms within eHealth and e-government areas. Significant results in this program have been achieved especially in the management of e-identities and electronic signatures. Austrian Citizen Card issued by the federal government in 2008 is considered one of the leading e-identity projects implemented in the EU. In accordance with the informatization strategy, the e-card (health insurance card) was delivered to more than 8 million policyholders and more than 12.000 GPs since 2005 (European Commission, 2008). As in Slovenia, the e-card initially contained only information about the health care insurance of citizens, in the second phase, however, which lasts from 2006 onwards, e-card contains an integrated suite of medical information which is complemented and updated sequentially.

Despite significant achievements in the field, the most important sub-project of eHealth remains development and implementation of a national EHR called Elektronische Gesundheitsakte (Government of Austria, 2009 and 2010). Development of EHR began in 2006 when a thorough analysis of the Austrian health care system and a feasibility study were conducted. In 2009 the institutional framework for the project was established, and a national health care portal (www.gesundheit.gv.at) was created in 2010. In parallel with development activities, the technical standards, interoperability framework and guidelines for further development of health care enterprise architecture were established and adopted. Actual implementation of national EHR started in 2011 through the realization of three pilot projects which were carried out at the regional level. In its first implementation phase, EHR will be mainly focused on e-prescribing and dispensing of e-prescriptions, along with gradual integration of the increasing number of medical data on e-card, in the years ahead. This should lead to the greater exploitation of medical data and higher quality of medical treatments as well as considerable elimination of the contraindications, reduction of allergic reactions and side effects. On the other hand, the implementation of e-prescribing should facilitate control over costs of medical treatments, prevent duplication of prescriptions, establish transparent functioning of the pharmacy market and provide an overview of the types and quantities of prescribed pharmaceuticals, as well as simplify their supply and distribution.

Notwithstanding the legitimate caveats highlighting primarily the protection of personal data and privacy as the most problematic areas of Austrian health care system informatization, development of EHR is undoubtedly an important asset for all policyholders and the entire health care system, while its long-term benefits will only be seen in the following years, when all planned applications and functionalities of eHealth become operative. Planned infrastructure of the eHealth project in Austria and the main relations between its components are depicted in Figure 2 (Pfeiffer et al., 2010).

Figure 2: Planned infrastructure of eHealth in Austria
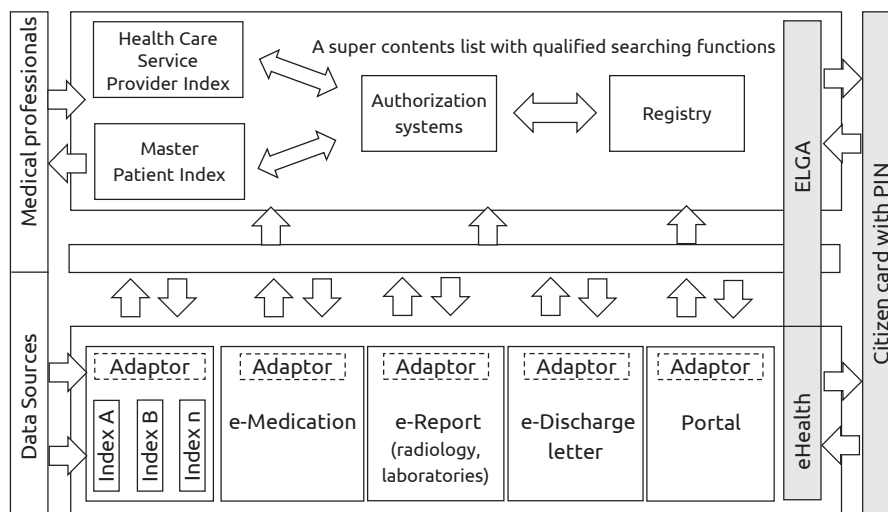
Effective implementation of national eHealth strategy in the coming years will require a parallel restructuration of the entire health care system and coordinated action at the medical, information and legislative level, as well as the execution of activities to raise awareness of the health care professionals and citizens, and to promote greater use of ICT solutions in health care. Under the latter assumptions, the Austrian health care policy is focusing particularly on the following activities:

- Achieving the overall interoperability and definition of standards for technical, semantic and organizational interoperability within the strategy for informatization of the health care system as well as the development of information society in general;

- Building of trust, protection of patient rights and ensuring responsibility of physicians and personal data protection in the process of EHR management;

- Development of national strategy and specific guidelines in order to facilitate safe and long-term archiving of EHR;

- Gradual elimination of semantic problems and implementation of common terminology for communication and data exchange, as well as monitoring and control of treatment procedures, patient requirements and satisfaction, and comparison of health care services and their quality nation-wide;

- Promotion and upgrading of a user-friendly health care portal accentuating prevention and citizens' participation in caring for their own health and well-being;

- Establishment of the health care provider networks and ICT infrastructure for the provision and execution of integrated social and health care services;
- Implementation of telemedicine projects for home therapy and assistance for disadvantaged population groups.

3.3   eHealth in Denmark

Denmark has a long history in the development of eHealth, which dates back to 1996, when implementation of the strategy for informatization of the health care and development of EHR began (Government of Denmark, 1996). Other initiatives for health care reform and introduction of advanced ICT solutions in health care have been embodied in National Strategy for Information Technology in Hospitals from 1999 (Government of Denmark, 1999) and National Strategy for Information Technology in Health Service 2003–2007 (Government of Denmark, 2003). The last set of strategic guidelines in the field of eHealth development and implementation is contained in Danish Policy Strategies with eHealth relevance, which refers to the Action Plan from 2003 and includes 29 projects connecting many different public institutions. MedCom is the national institution responsible for realization of the eHealth project and acts as coordinator of project activities between health care policy, health care professionals, citizens and ICT service providers. MedCom manages the process of informatization in the Danish health care system, issues certificates of safety and quality in health data exchange and promotes integration of HIS in hospitals and pharmacies (Jensen & Pedersen, 2004). Within the Danish health care system 4 million messages are exchanged every month, including 80 percent of all prescriptions. MedCom also controls electronic data interchange and manages patient identities and safety of personal data through integrated three tier system, which includes the public key infrastructure and allows the traceability of each entry to the system. A key part of the strategy and the ultimate goals of the Danish health care system informatization are the development of integrated HIS and implementation of EHR (Doupi et al., 2010), whereas the future activities within eHealth are focused primarily on:

- Extension of existing applications in the eHealth scheme, more effective integration of the local HIS and e-prescriptions with the aim of developing a personal health profile of the patient, which would be stored on a national medical data server, further improvement of e-prescribing;
- Promotion, upgrading and enhancement of the national health portal Sundhed.dk, awareness-raising between citizens and health care professionals, facilitating the full functionality of the national health portal and general accessibility by using the digital signature;

- Upgrading of health data networks, information infrastructure and personal data protection system, effective intersectoral communication that includes the exchange of more than 40 different types of standard documents (e-prescriptions, e-referrals and e-lab tests, specialist e-referrals, etc.);
- Effective further implementation of the electronic health card project (Common Medication Card — FMK) throughout the country, inclusion of wider range of medical and administrative data on the electronic health card and promotion of its functionality for both patients and health care professionals;
- Effective transfer of medical and administrative patient data across regional boundaries in order to ensure the quality of health care throughout the country, further development and implementation of telemedicine projects for chronic patients, and deployment of cross-border health care networks in the region.

Danish health policy makers have managed to attract a wide range of stakeholders collaborating in the development and implementation of eHealth. Political will and stakeholders' commitment as well as their coordinated action have provided necessary resources, professional and technical support and adaptation of legislation, being some of the reasons for their success. For example, in 2005 the tax legislation was adjusted, which allowed a separate agreement between the government and owners of the regional hospitals, who required equal access to EHR and e-prescriptions throughout the country. The regulatory framework of health care has been adapted as well, since the Act on health care from 2008 (Government of Denmark, 2008) had to take into account the specific requirements in the area of confidentiality and protection of personal data, referring to the implementation and use of eHealth. Among other factors, which influenced the development and intensive use of eHealth applications in Denmark, some other aspects could be exposed, such as: the construction of high-quality ICT infrastructure and health information network, which was built on existing infrastructure building blocks of e-government and the establishment of the National Health Portal (Sundhed.dk), providing uniform access point to health care services for both citizens and health care professionals. Planned infrastructure of the eHealth project in Denmark and the main relations between its components are presented in Figure 3 (Government of Denmark, 2012).

The National Patient Index and The National Health Record will provide health care professionals and patients with access to more complete overview of existing patient data. This will benefit health care professionals and patients in several ways by facilitating (Government of Denmark, 2012):

- A clinical tool that enables digital sharing of data across borders and sectors in the health care system;

- A tool for gaining digital access to patient data not already stored in local EHR systems;
- Support in decision-making in relation to referral, elucidation and treatment of a patient;
- Giving citizens access to a broader range of own health data thereby establishing a foundation for improved dialogue, better insight in their own health condition and improved possibility for active involvement in their own treatment.

Figure 3: Planned infrastructure of eHealth in Denmark
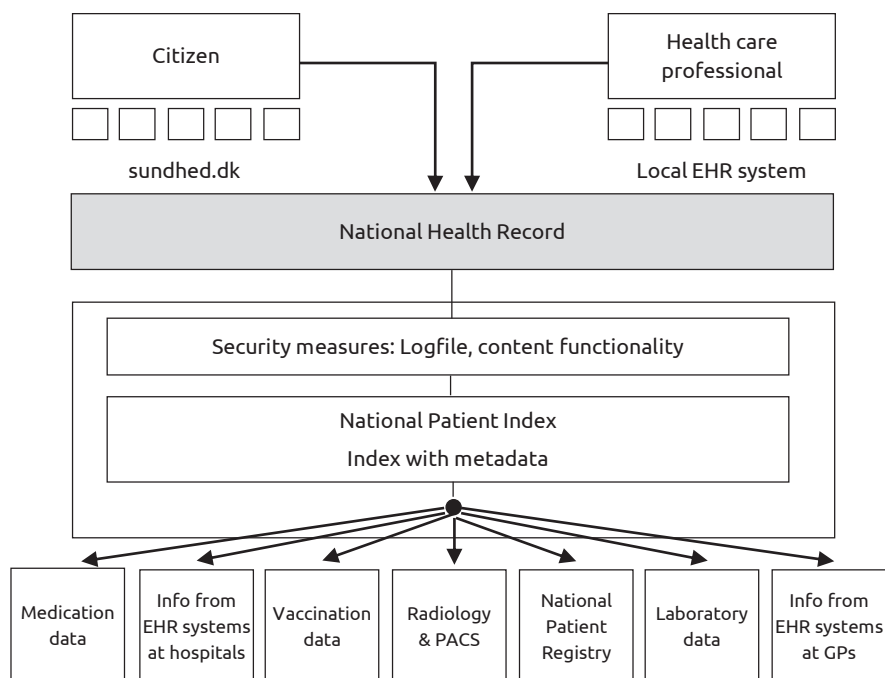
3.4 Comparative Analysis of the eHealth Development in Slovenia, Austria and Denmark

The comparative analysis of the eHealth development in Slovenia, Austria and Denmark was conducted in the first half of 2013. During that time we carried out extensive document analysis and information retrieval through in-depth investigation of primary and secondary online resources, policy papers, strategies, project reports and records, interviews, action plans and other forms containing eHealth related contents in the selected countries. Given the substantial scope, complexity and diversity of the eHealth projects, as well

as the asymmetrical development of the individual thematic and organizational areas within them, comparing the development of the entire eHealth projects was unfeasible. We therefore applied structural decomposition techniques, through which we identified and extracted 12 relatively autonomous and comparable infrastructure components from designated eHealth projects. Subsequently, by evaluating the development level of the selected components, we transformed these components into 12 equally weighted indicators. Given the two fundamental contextual dimensions, which reflect the general development degree of the eHealth projects and their alignment with other relevant factors within the healthcare ecosystem, the indicators were categorized in two groups, namely: operative and technological indicators, and policy and performance indicators (see Table 1). The aggregate of the sensibly evaluated indicators should reflect the actual overall development level of the eHealth projects in the selected countries.

Development level of the individual components, and ultimately the overall development of eHealth, was evaluated applying the following grades (see their explanations in parentheses):

1 – Conceptual phase (Component and its operations are based only on the conceptual design; its development, sourcing and implementation procedures have not yet been defined or started).

2 – Development phase (There is a concrete blueprint for the construction of the component encompassing all planned operations. Development, sourcing and implementation procedures have been defined, initiated and monitored).

3 – Partly functional (Some of the planned component operations are implemented, functional and applied in practice within the health care environment).

4 – Functional (All of the planned component operations are implemented, functional and applied in practice within the health care environment).

Finally, based on the assigned grades, the calculation of the average score of the components' development level was carried out, facilitating the determination of overall development level and associated comparative ranking of eHealth projects in the selected countries. The nominated components within eHealth projects were defined and selected partly on the basis of EU research and guidelines (European Commission, 2008, 2009 and 2011) striving to identify the most important factors for development of comprehensive eHealth projects. Comparative analysis was conducted combining different techniques (Yin, 2009) of qualitative research methods. The initial part of the comparative analysis has focused on the document analysis through in-depth investigation of existing eHealth-related sources, whereas deriving from obtained investigation results, the conclusive part of the comparative analysis is striving to integrate theoretical and practical aspects regarding

the research subject, and provide applicable guidelines for further deve-lopment and implementation of eHealth in Slovenia.
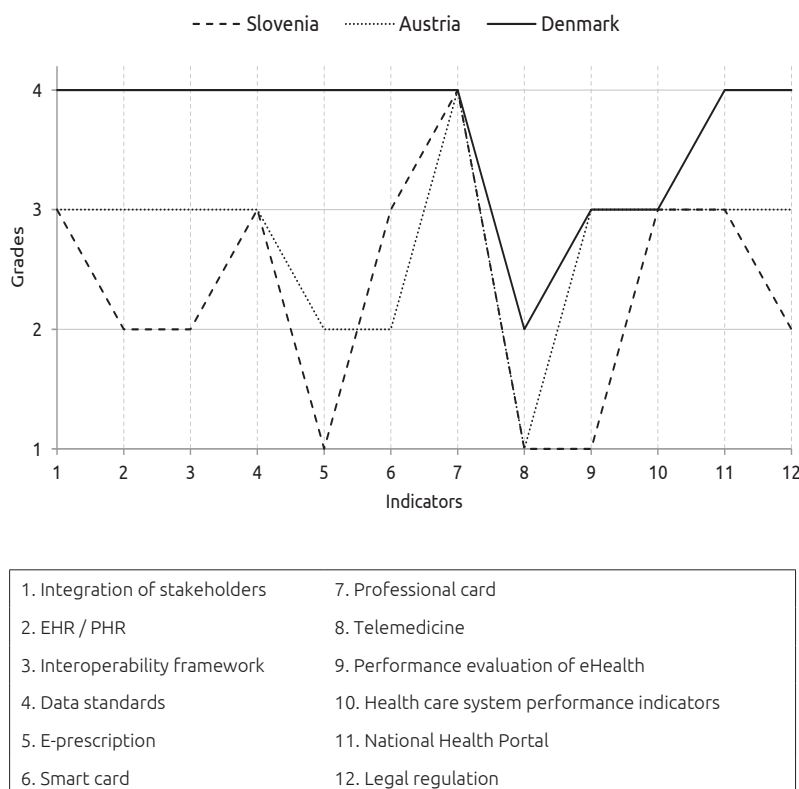
Tabela 1:   Indicators for the Comparative Analysis of eHealth Development in Slovenia, Austria and Denmark

Indicators	
Operative and technological indicators	Policy and performance indicators
EHR / PHR	Integration of stakeholders (policy guidelines, reports, data exchange, education and training etc.)
Interoperability framework	Legal regulation
Data standards	Health care system performance indicators
E-prescription	Performance evaluation of eHealth
Smart card	
Professional card	
Telemedicine	
National Health Portal	
Overall rating of the eHealth development in the selected countries	

Despite the fact that, unlike the Danish project, both the Slovenian and Austrian eHealth projects are still deep in the implementation phase and will not become fully functional for some time (Doupi et al., 2010; Ministry of Health, 2011; Pfeiffer et al., 2010), the research revealed some intere-sting findings. Comparative analysis confirms the undisputed supremacy of Denmark (overall average score 3,67, std. deviation 0.65) in the field of overall eHealth development in comparison with Austria (overall average score 2,75, std. deviation 0,75) and Slovenia (overall average score 2,33, std. deviation 0,98) (Figure 4). Considering the particular groups of indicators (operative and technological indicators, policy and performance indicators) ranking has remained unchanged. Based on the operative and technological indicators, Denmark has won the highest ratings (average score 3,50, std. deviation 0,58), Austria is in the second place (average score 3,00, std. deviation 0), and Slovenia was third (average score 2,25, std. deviation 0,96). Taking into account the policy and performance indicators, the evaluation yielded rather similar results (Denmark – average score 3,75, std. deviation 0,71, Austria – average score 2,63, std. deviation 0,92, and Slovenia – average score 2,38, std. deviation 1,06). Although relatively successful in the field of eHealth deve-lopment, according to our comparative analysis Austria achieved comparati-vely lower results than Denmark in most of the categories compared. Slovenia showed the least progress in the field of eHealth development and achieved the lowest score in the comparative analysis, considerably lagging behind the Denmark, and Austria as well. Danish eHealth project achieved superior

results in all comparative categories, except two (performance evaluation of eHealth, health care system performance indicators).

Figure 4: Development of individual components of eHealth in Slovenia, Austria and Denmark

1. Integration of stakeholders	7. Professional card
2. EHR / PHR	8. Telemedicine
3. Interoperability framework	9. Performance evaluation of eHealth
4. Data standards	10. Health care system performance indicators
5. E-prescription	11. National Health Portal
6. Smart card	12. Legal regulation

The most visible gap involving the comparison of strategies and documents related to the development of eHealth comprises the very start of the eHealth project in Denmark, which was initiated nearly 10 years before eHealth projects in Slovenia and Austria. In addition, the number of strategies and documents concerning the national project of eHealth and general promotion of ICT application in health care exceeds the number of similar documents from Slovenia and Austria. Relating to the number of stakeholders involved, which is comparable to the numbers in Slovenia and Austria, Denmark has obviously managed to dispel the conflicting views and other barriers between them, and establish their quality cooperation, coordination and commitment to the eHealth initiative, proving that development and implementation of such complex and important projects require broad social consensus and close interdepartmental collaboration. From the comparative perspective, eHealth in Denmark achieved notable results in almost all categories, except in the areas of Telemedicine, Performance evaluation of eHealth and Health care

system performance indicators, which comparatively accomplished relatively lower results. Denmark is producing excellent comparative results at the level of the EU27 as well, often dominating the top rankings in various classifications of eHealth development (European Commission, 2008, 2009 and 2011).

Slovenian eHealth project has encountered a series of obstacles and setbacks in the course of development and implementation, consequently the date of its completion, earlier planned for 2023, is rather difficult to determine. However, the comparative analysis revealed significant deficiencies in the overall up-to-date development of eHealth in Slovenia and a large gap between Slovenia on one hand, and Austria and Denmark on the other hand, especially regarding the development of individual components of eHealth. Namely, 5 out of 12 selected and compared components of eHealth in Slovenia reached a lower development level than in Austria; however there is even bigger difference compared to Denmark, where Slovenia has achieved a lower development level in 10 of the 12 components compared. Especially concerning is the fact that according to some estimates, eHealth development in Slovenia considerably lags behind the EU-27 average, as well (European Commission, 2008 and 2011; Ministry of Health, 2011). Based on the comparison of eHealth development in Slovenia, Austria and Denmark (Table 1), the explicit deficiencies related to particularly underdeveloped eHealth components (listed components were graded with scores less than 3 – Partly functional) are summarized and defined below:

- EHR / PHR – Two of the most important components of eHealth are in the development phase and currently do not provide required functionality enabling database connectivity for patients migrating from primary to secondary and tertiary health care level);

- Interoperability framework – Component is in the development phase and currently does not facilitate operationalization of adopted standards and integration of existing IS within health care, laboratory and radiology departments (lab results, Picture Archiving and Communication System – PACS etc.);

- E-prescription – Component is in the conceptual phase and the time frame for its construction and subsequent inclusion in the eHealth infrastructure is still indeterminate;

- Telemedicine – Component is in the conceptual phase and although contained in the Slovenian eHealth strategy from 2005, development activities in the telemedicine field have not been specified, let alone launched;

- Performance evaluation of eHealth – Component is in the conceptual phase, since health policy in Slovenia has not established a methodology including appropriate indicators for evaluating the performance of already implemented operational components of eHealth and monitoring of the components in the development process;

- Legal regulation – Component is in the development phase lacking several important regulations for the eHealth application, especially regarding the transfer of medical data, personal data protection, privacy, interoperability standards, liability and risk issues within the usage of EHR / PHR, Telemedicine and E-prescription. Given the existing political debate focused predominantly on economic issues and stringent austerity measures, lack of support and incentives for legislative amendment in the field of eHealth is likely to remain unchanged for some time.

Listed components are in the early development stages. Taking into account the complexity of developing such components, time required for their transfer into operational use and the current budgetary restrictions, it is clear that operations depending on these components, and consequently the entire eHealth project, will not become fully functional for a long time. This is certainly a broader systemic problem and given the scope of health care system, its relations and interdependencies with other segments of the society (European Commission, 2011), it should be noted that eHealth is only a part of the complex social system (European Commission, 2007), while its perception and subsequent application are deeply rooted in the social mode of behavior (Anwar et al., 2011; Kaye et al., 2010) and working practices of organizations and people.

The deficiencies within the development of eHealth in Slovenia, which obviously extend to several areas, such as policy-regulatory, financial, institutional and technological area, could have been mitigated by taking appropriate measures in the course of its conceptualization, planning and implementation. Nevertheless, exposed deficiencies have significant impact on overall performance of eHealth, and consequently do not allow its effective utilization for improvement of health care services and evidence-based management of the health care system. The most significant deficiencies revealed by our research are summarized below:

- Absence of top-down support for implementation of eHealth;
- Poorly defined health care policies and eHealth project objectives;
- Unadjusted and hyper-regulated normative framework;
- Insufficient funding, lack of management skills and human resources;
- Fragmentation and large number of diverse legacy IS on all three levels of health care system;
- Partially defined communication network standards and data exchange standards;
- Lack of standardized definitions of health and social data required for development and management of EHR, PHR and DRG;
- Disregarding interoperability perspective while procuring an increasing number of narrowly specialized IS;

- Inadequate and vague evaluation practice in the field of major ICT projects;
- Lack of experience in the execution of complex and long-term national (ICT) projects;
- Unawareness of the potential benefits of eHealth and lack of skills within the scope of ICT by the health care professionals;
- Lack of consensus on development priorities as well as cooperation and coordination between key stakeholders.

Deriving from the comparative analysis, issues listed above have not been properly and fully addressed, while they seem to be very important elements of the effective strategy for development and implementation of eHealth.

4   Lessons Learned and Guidelines for Future Actions

Assessing the development and future trajectory of the eHealth has proven to be a very difficult task, given the complexity of the eHealth projects themselves and lack of appropriate evaluation metrics. Therefore, it is not surprising that in Slovenia, as well as in the international arena, there are only a very small number of research attempts concerning evaluation of the eHealth development, especially through the international comparison. Notwithstanding the state of affairs in the research field, certain preliminary conclusions can be drawn. It is evident that problems concerning the progress of the Slovenian eHealth extend to various areas, reflecting in the unsatisfactory development level of individual infrastructure components and eHealth project as a whole, whereas on-going financial and economic crisis just revealed the magnitude of pertaining deficiencies, additionally undermining public trust and stakeholders' engagement. Health care systems which strive for the successful development and implementation of eHealth projects have to generally overcome difficulties with the political, legal/regulatory and technical constraints, provide appropriate funding for material and immaterial resources, and precisely specify the course and objectives of the eHealth projects.

Analyzing the current situation in the field of eHealth, we identified various deficiencies which have in our opinion substantially affected the development of eHealth in Slovenia. Some of the problems associated with eHealth development and implementation have been expected, given its scope and complexity, while the other complications appeared unpredictably and were merely the results of poor planning and insufficient project analysis. Synthesis of research results and derived deductions, based on the identified deficiencies, are presented in the form of guidelines, which could facilitate a more effective and structured approach to the realization of the eHealth project:

- Obtain political support, bring together stakeholders from the public sector, not-for-profit organizations and the private sector, and prepare viable strategy documents and action plans (assess the current ICT

infrastructure, departmental IS, legacy IS, interoperability issues, specify the health information standards, education and training of the medical staff, analyze different informational needs of primary, secondary and tertiary health care level, check the financial construction and financial projections related to the budget of eHealth in the medium and long-term, examine the potential obstacles to eHealth realization and conduct a sensitivity analysis, etc.);

- Examine current and projected health care issues, incorporate country specificities, determine national health care priorities, and provide an action plan clearly specifying how eHealth will contribute to the solution of national health care priorities, as well as enable desired reorganization and restructuration of the health care system itself;

- Select a top manager and a quality project team with experience in large ICT projects, clearly structure the project plan, project phases and deliverables for each phase, determine the timeline of the project by reaching mutual consensus with all stakeholders, distribute the assignments and strictly monitor and inspect the work on the project;

- Ensure adequate resources before the start of each phase of the project and make realistic plans within both temporal as well as financial terms;

- Mobilize all stakeholders to ensure commitment, material and moral support, encourage their participation and constructive criticism, provide an inclusive plan for permanent education of the stakeholders and communication between the project team;

- Enhance the preparation and implementation of public tenders (materially and procedurally) related to procurement of ICT equipment and realization of smaller individual ICT projects within the overall eHealth project;

- Perform a constant supervision and strict control of the already executed project tasks with respect to the substantive and temporal objectives, and ensure close monitoring of the tasks which are in the execution phase;

- Inform and sensitize the public, promote project achievements so far, organize marketing campaign to popularize the eHealth project and increase user acceptance of eHealth services, gain support from the media, experts and citizens; eHealth is a socio-technical project.

Presented research results cannot be easily transferred into action, while the poor progress in development of eHealth in Slovenia is related to several factors. Delays in eHealth development require a detailed analysis of the current situation, accommodation of new resources and well-coordinated implementation of operational tasks, which will gradually bring the development of eHealth to its final phase. These measures usually necessitate a radical change in the project management and government financial stimulus. Alarming socio-economic situation could jeopardize the latest efforts

and compel the government to focus on predominantly short-term economic issues and lower the investments for development of eHealth and health care system in general, which could result in far-reaching and irreversible implications for public health in the future. Better exploitation of ICT in health care and eventual provision of medical and economic benefits as well, will therefore require the mobilization of all stakeholders and experts in the field, definition of clear and measurable objectives and a broad consensus about the necessary public expenditures.

5 Conclusions

Considering the potential and almost unparalleled role of ICT in the modern health care systems, eHealth currently represents a very hot topic and could define the main trajectory of health care system action in the future and articulate its long-term goals in general. Conducting a comparative analysis of the eHealth development has emerged as a very challenging mission. So far there is no universally-acknowledged methodology for evaluating the development of overall eHealth projects or their individual components, while the efforts trying to provide at least some kind of comparative framework or conduct international comparative analysis of eHealth development are extremely limited. Although reasonably susceptible to subjectivity and arbitrary interpretations, comparative analysis in hand provides a valuable insight into the developmental characteristics of eHealth projects in Slovenia, Austria and Denmark, and can contribute to theory building in the field. Main limitations of the study probably concern the adequacy of performed weighting process and the fact that development level of individual eHealth component was actually defined on the basis of primary and secondary sources investigation without empirical testing and practical validation of each component in the health care environment. Accordingly, the issues of equal weights assigned to designated indicators and objective definition of development level raise some questions of principle, while the results of the comparative analysis may therefore be arguable and misleading. These issues should be properly resolved in further research and succeeding experiments trying to establish a theory-based and balanced framework for evaluation and comparative analysis of the eHealth development in national and international context. Despite certain methodological dilemmas and limited resources, conducted comparative analysis reveals the intricate dynamics of the eHealth development and potential deficiencies and barriers. Moreover, the comparative analysis, including designated guidelines, may eventually provide the groundwork for further development and implementation of the intractable and costly eHealth projects, and useful assistance for enhanced allocation of project management resources.

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POVZETEK

Razvoj eZdravja v Sloveniji – kritični vidiki in smernice za prihodnost

S problematiko informatizacije zdravstva se Ministrstvo za zdravje Republike Slovenije (MZ) ukvarja že dobri dve desetletji. Kljub zgodnji osnovni informatizaciji zdravstvenih organizacij v Sloveniji še vedno ni povezljivega in celovitega zdravstvenega informacijskega sistema (ZIS). Številni tovrstni informacijski sistemi (IS) so bili razviti znotraj posameznih javnih zdravstvenih institucij in so namenjeni predvsem zadovoljevanju lastnih potreb. Obstoječi ZIS med seboj niso zadostno komunikacijsko povezljivi in ne nudijo zanesljivih, relevantnih in ažurnih podatkov. Cilj projekta informatizacije slovenskega zdravstvenega sistema (eZdravje) iz leta 2005 je uvedba sodobnih in večstransko uporabnih informacijsko-komunikacijskih tehnologij (IKT) v poslovanje slovenskega zdravstvenega sistema ter povezava lokalnih IS v funkcionalen nacionalni ZIS. Tovrsten nacionalni ZIS bi državljanom in zdravstvenim delavcem zagotovil premostitev številnih ovir pri iskanju informacij, ki so relevantne za proces zdravstvene oskrbe, upravljavcem pa bi omogočil boljše spremljanje poslovanja zdravstvenih zavodov ter na dokazih temelječe odločanje in ukrepanje. S celovito informatizacijo bi si slovensko zdravstvo zagotovilo možnosti za kakovostno delo z bolniki, učinkovito upravljanje zdravstvenih informacij, nadaljnji razvoj zdravstvenega sistema ter njegovo konkurenčno vključevanje v evropski prostor. Na podlagi verodostojnih ekonomskih, administrativnih in kliničnih podatkov bi bilo omogočeno lažje načrtovanje in upravljanje zdravstvenih zavodov oziroma zdravstvenega sistema kot celote. Slednje bi pomenilo odločen korak k doseganju dolgoročnih ciljev ter omogočilo zadovoljitev naraščajočih potreb in različnih interesov deležnikov zdravstvenega sistema.

Projekt eZdravje v svoji najnovejši obliki zajema obsežno prenovo informacijsko-komunikacijskega sistema v zdravstvenem varstvu v Sloveniji. Do leta 2023 naj bi tako predvidoma uresničili projekt informatizacije zdravstva in vzpostavili nacionalni ZIS, ki naj bi s svojimi strateškimi usmeritvami in cilji omogočal spremljanje bolnikov in poteka ter stroškov zdravljenja, hitrejši dostop do podatkov, spremljanje opravljenih zdravstvenih posegov in njihovo zdravstveno kot tudi ekonomsko evalvacijo, spletno naročanje ter uskladitev čakalnih seznamov, povečal učinkovitost in preglednost slovenskega javnega zdravstva in optimiziral pripadajoče izvedbene procese, ki se odvijajo v zdravstvenih zavodih. Kljub znatnim naporom in relativno visokim naložbam v projekt informatizacije slovenskega zdravstvenega sistema, MZ v Resoluciji

o nacionalnem planu zdravstvenega varstva 2008–2013 ugotavlja številne pomanjkljivosti na področju slovenske zdravstvene informatike.

Izhajajoč iz predstavljene problematike, se članek posveča preučevanju naslednjih raziskovalnih vprašanj:

1. Pregled projektov eZdravja in s tem povezanih strategij v Sloveniji, Avstriji in na Danskem.
2. Analiza razvitosti projektov eZdravja v Sloveniji, Avstriji in na Danskem.
3. Identifikacija glavnih pomanjkljivosti na področju razvoja eZdravja v Sloveniji in zagotavljanje smernic za nadaljnji razvoj.

Pri izvedbi raziskave je bila uporabljena primerjalna analiza. Le-ta se je najprej oprla na pregled primarnih in sekundarnih virov na področju razvoja in implementacije projektov eZdravja v Sloveniji, Avstriji in na Danskem. V prvi fazi raziskave so bile uporabljene osnovne družboslovne znanstvenoraziskovalne metode. V nadaljevanju raziskave so bili predstavljeni kazalniki, na podlagi katerih je bila dejansko izvedena primerjalna analiza razvitosti projektov eZdravja v izbranih državah. V tem delu raziskave je bil uporabljen kompleksnejši znanstvenoraziskovalni inštrumentarij, ki je s pomočjo sintetično-analitičnih metod povezal teoretična in primerjalna spoznanja z obravnavanega področja. Raziskovalne aktivnosti so bile umeščene v inkrementalni metodološki okvir, ki je značilen za tovrstne primerjalne analize. Izbira znanstvenoraziskovalnih metod je bila prilagojena raziskovalni problematiki in posebnostim kompleksnega raziskovalnega področja.

Primerjalna analiza v prvi fazi zajema kratek povzetek strateških izhodišč na področju projektov eZdravja v Sloveniji, Avstriji in na Danskem, v nadaljevanju pa na podlagi izbranih kazalnikov primerja stopnjo razvitosti projektov eZdravja. Čeprav sta za razliko od danskega tako slovenski kot tudi avstrijski projekt eZdravja še globoko v fazi implementacije in še kar nekaj časa ne bosta zaživela v celoti, bodisi zaradi tehničnih težav bodisi zaradi javnofinančnih omejitev, pa je na podlagi nekaterih dejavnikov že mogoče ovrednotiti dosedanji razvoj projektov eZdravja v Sloveniji in drugih članicah EU ter določiti njihove prednosti in pomanjkljivosti. Kazalniki, ki so bili v prispevku uporabljeni za oceno razvitosti projektov eZdravja v izbranih državah, so uvrščeni v dve skupini in sicer:

1. Operativni in tehnološki kazalniki
   - Elektronski zdravstveni zapis (EZZ)
   - Interoperabilnostni okvir
   - Podatkovni standardi
   - E-recepti
   - Kartica zdravstvenega zavarovanja (KZZ)
   - Profesionalna kartica

- Telemedicina
- Nacionalni zdravstveni portal

2. Politični kazalniki in kazalniki uspešnosti
   - Vključitev deležnikov (politične smernice, poročila, izmenjava podatkov, izobraževanje in usposabljanje, itd.)
   - Pravna ureditev
   - Kazalniki uspešnosti zdravstvenega sistema
   - Vrednotenje delovanja eZdravja

Na podlagi slednjih kazalnikov prispevek podaja skupna oceno razvoja eZdravja v izbranih državah ter v nadaljevanju tudi ustrezne smernice za preseganje ugotovljenih pomanjkljivosti in učinkovitejši razvoj projekta eZdravje v prihodnjem obdobju.

Primerjalna analiza potrjuje nesporni primat Danske na področju razvoja projektov eZdravja v primerjavi s Slovenijo in Avstrijo. Danski projekt eZdravja prednjači pri oceni vseh primerjalnih dejavnikov, najvidnejša razlika pa je vidna na področju politik in strategij, povezanih z eZdravjem, saj je Danska pričela z razvojem projekta eZdravje skoraj 10 let pred Slovenijo in Avstrijo. Danska je v procesu zasnove, razvoja in implementacije projekta eZdravje očitno dosegla širši družbeni konsenz in uspela vzpostaviti tesno medresorsko sodelovanje ter koordinirano in zavzeto delo vseh deležnikov, kar je odločilnega pomena za učinkovito realizacijo tako obsežnih in dragih projektov, kot je eZdravje. Glede primerjalnega vidika operativnosti aplikacij znotraj eZdravja dosega Danska zavidljive rezultate v vseh kategorijah, razen na področju vrednotenja delovanja eZdravja, kjer se ta izvaja samo delno. Danska pri vseh izbranih dejavnikih dosega primerjalno gledano uspešne rezultate tudi na ravni EU-27 in se v številnih klasifikacijah razvitosti projektov eZdravja uvršča na prvo mesto.

Prispevek razkriva pomembne pomanjkljivosti v dosedanjem razvoju in uporabi aplikacij eZdravja v Sloveniji. Večina kazalnikov dosega slabše rezultate od Avstrije in Danske, primerjava pa kaže, da segajo tudi pod povprečje EU. Upoštevajoč kompleksnost razvoja tovrstnih aplikacij in dolgotrajnost njihovega prenosa v operativno uporabo ter aktualnih proračunskih omejitev je jasno, da omenjene funkcionalnosti eZdravja v Sloveniji še dolgo časa ne bodo zaživele. Simptomatična je tudi nezadostna uporaba že obstoječih aplikacij in IKT orodij. To na eni strani nedvomno kaže na nezadostno ozaveščenost ter pomanjkanje usposobljenosti zdravstvenih delavcev na področju uporabe IKT, na drugi pa na pomanjkanje impulzov in spodbud menedžmenta za intenzivnejšo izrabo potencialov, ki jih nedvomno ponujajo sodobne IKT rešitve.

Na podlagi slednjih ugotovitev so bile ob koncu primerjalne analize oblikovane smernice, ki naj bi pomagale učinkoviteje usmerjati razvoj eZdravja v prihodnjem obdobju.

V skladu z raziskovalnimi izhodišči prispevka je izčrpen pregled razmer na področju razkril, da težave, s katerimi se srečuje projekt eZdravje, na eni strani izhajajo iz tehnično-tehnoloških značilnosti obstoječih ter povečini fragmentiranih ZIS, ki so posledica neusklajenega razvoja na področju zdravstvene informatike v zadnjih desetletjih. Na drugi strani pa glavni krivci za obstoječe stanje prihajajo iz upravljavskih oziroma političnih krogov, ki so razvoj zdravstvene informatike v tem obdobju prepustili lastnim pobudam, potrebam in interesom posameznikov na ravni zdravstvenih zavodov. Poleg tega pristojni v zadnjih letih niso uspeli spodbuditi razvoja in uresničitve projekta informatizacije z močnejšo politično (finančno, kadrovsko, organizacijsko) podporo ter oblikovanjem moderne in konsistentne strategije na področju.

Ne glede na nesporno pomembnost do sedaj že uresničenih in v naslednjih dveh letih pričakovanih podprojektov na področju eZdravja, ostaja skrb, da bodo ti podprojekti ostali nepovezani v neko funkcionalno celoto, ki bi lahko prispevala v boju z vse večjimi težavami, s katerimi se srečujemo v zdravstvu. Največji razlog za skrbi leži predvsem v pomanjkanju dolgoročnega politično--strateškega okvirja, v katerega bi lahko umestili izolirane podprojekte in jih povezali v konsistentno in celovito nacionalno rešitev. Trenutna odsotnost strateških smernic in operativnega načrta lahko znatno prispeva k razvojnemu zastoju in posledično spodkopa vse dosedanje napore ter odloži končno realizacijo projekta za nedoločen čas.

Ne glede na nekatere metodološke dileme in omejene dokumentacijske vire, prispevek celovito razkriva zapleteno dinamiko razvoja eZdravja in določene pomanjkljivosti ter ovire, s katerimi se srečujemo. Izvedena primerjalna analiza lahko na eni strani zagotovi podlago za nadaljnje raziskave na obravnavanem področju, na drugi strani pa lahko predstavljene razvojne smernice pripomorejo k oblikovanju strateških izhodišč za učinkovitejšo implementacijo in operacionalizacijo projekta eZdravje v Sloveniji.