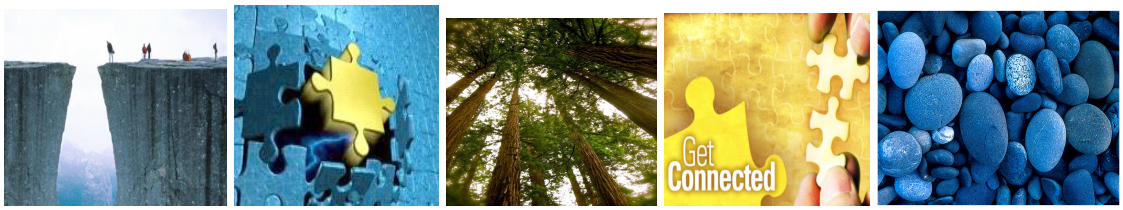

Health investments using Structural Funds

EUREGIO III Case study - National eHealth Project – Slovenia 2007-2013

EUREGIO III project -Work Package 5: Case material

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Extended Version

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Contents

Executive Summary

The national eHealth project of Slovenia is implemented during 2007-2015. It is co-financed by the government of Slovenia and the EU through the European Social Fund, as part of the Slovene "Human Resources Development" Operational Programme of 2007-2013.

The project responds to the need to improve health information processing and the evidence base on a changing national epidemiological profile. Its aims include facilitating information access for all healthcare professional groups and citizens, improving planning and management of healthcare infrastructure and services, and promoting the citizens' active role in managing their health and healthcare.

The project features the delivery of three system modules, parts of the national electronic Health Information System – eHIS. These are the national health information exchange telecoms network, the national eHealth portal, and national Electronic Health Record – EHR. Additional deliverables include the Slovene National Centre for eHealth and an education and training programme for healthcare professionals on using eHealth services.

A special consultation and management framework has been developed to progress the project since the Slovene eHealth strategy inception in 2007. This is based on consensual decision making and has involved the six major stakeholder organisations –Ministry of Health, Health Insurance Institute of Slovenia, Association of Healthcare Institutions, Medical Chamber, Chamber of Pharmacy, and the National Institute of Public Health. The framework features five committees where members of these organisations participate according to seniority and expertise. Decision making and implementation have been led by the Ministry of Health.

The project is understood to be delayed by domestic stakeholders and the European Commission. The main reason put forward in this report is that stakeholder consultation has not delivered clear, inclusive and well understood contractual arrangements among them as a basis for implementation. Based on expert stakeholder representative interviews in Ljubljana and London in 2011 and secondary research, the report outlines several confounding factors. The lack of domestic eHealth expertise, belated engagement of the IT industry, the chosen network architecture for the national health telecoms network are discussed in a context of contested decision-making among stakeholders and a wider national healthcare reform process.

The report concludes with recommendations on how to advance the project from its current stage, a requirement expressed by all domestic stakeholders. These include launching an initiative to enhance stakeholder consultation and redress the balance of contributions in project decisions; use full cost analysis methods to ensure eHealth services are affordable by all stakeholders; identifying experts to provide informed input to tenders in line with stakeholder consultation; closer collaboration among selected stakeholders to successfully complete pilot projects; proactive deliberation on using new technologies to extend the proposed eHealth infrastructure; and activating a programme of events to stimulate and sustain healthcare professional groups' engagement and involvement.

1. Introduction

This report examines the process underpinning the design, build and operational phases of the national eHealth project of Slovenia, *eZdravje*. Its aims are in line with EUREGIO III, namely to extract useful lessons from this process and inform EU regions on how they should plan and implement similar projects. This national eHealth project forms part of the Slovene "Human Resources Development" Operational Programme, co-financed by the EU during the 2007-2013 period.

The report begins with a brief discussion of the main challenges regarding the provision of services in the Slovene healthcare system during the period 2000-2010, and the procurement methods introduced to help address these. It then reviews the background and objectives of this national eHealth project, the funding scheme chosen and key procurement aspects. After a cursory review of the main issues identified as part of the process of designing and implementing this project, the report moves on to take a closer look at the special attributes of *eZdravje*. These includes the special, consensual project management framework put in place to enable stakeholder engagement and involvement, some of the key organisational relationships that have resulted, and examples of innovation identified in each of the design, build, and anticipated operational phase of *eZdravje*.

The main premise of the report is that the relative lack of progress of *eZdravje* is not to be understood in conjunction with EU Cohesion policy regulations, the Structural Funds and programming aspects in Slovenia. Key reasons for this lack of progress are traced within the timeline and the manner in which the project has evolved. Since 2007 when key documents were published, and consensual decision-making amongst the main Slovene healthcare stakeholder organisations was established along with a special project management framework, the project has progressed in a manner that offers ground for useful observations regarding the design and implementation of national eHealth projects.

2. Methodology

This report has been put together on the basis of material collected through the following two qualitative research tasks:

- transcription of semi-structured interviews with informants-representatives of Slovene healthcare organisations, stakeholders to the national eHealth project;
- a review of key academic papers, policy studies and programme documentation with a focus on the Slovene national eHealth project.

Informants consulted for this report hold senior positions in their organisations. They have international and domestic professional experience in public health monitoring and management, health informatics, public procurement as part of telecoms, transport infrastructure projects and EU programmes. Most informants have had exposure to the project since the inception of the national eHealth strategy in 2007. Stakeholder organisations include the Slovene Ministry of Health

(MoH), the Health Insurance Institute of Slovenia (HIIS), the European Commission DG Employment, Social Affairs and Equal Opportunities (EC), the Managing Authority (MA) of OP Human Resources Development, the National Institute of Public Health, Association of Healthcare Providers, the Medical Chamber, IT industry firms and member firms of ProREC Slovenia.

The material has been analysed through the qualitative content analysis method outlined in (Flick, 2002:190-192). The following steps have been undertaken:

- identification of the relevant material to answering the research question;
- analysis of the data collection situation;
- composition of the research question;
- definition of the analytical technique;
- definition of analytic units;
- conduct of the analysis;
- interpretation of results.

The research questions formulated towards meeting the objectives outlined in section 1 are:

- what have been the main public health challenges and procurement structures in place to address these during 2000-2010 in Slovenia;
- who are the main stakeholders, their roles and interrelationships in this national eHealth project;
- what are the contractual arrangements supporting this project;
- are there examples of innovation identified in the planning, build and operational phases of the project;
- what has been the project's performance during 2007-2011, and what are its current challenges.

The report concludes with recommendations based on observations emerging from the analysis and interpretation of results.

3. Slovene national health system challenges

At the start of the period 2007-2011, key challenges with regard to designing and providing services identified in the Slovene national health system were the following (see also Albreht *et al*, 2009:8-15):

- an ageing population characterised by low birth rates, fertility ratios, and an increase of chronic diseases;
- regional variations in morbidity and mortality, with changes expected at a national population level;
- empowerment and involvement in care delivery on behalf of citizens and patients;

- enhancing the efficiency of the national healthcare system;
- modernisation, connectivity, and wider utilisation of existing health-related IT platforms to improve disease surveillance, health services planning and delivery.

Healthcare capital investment in Slovenia has been primarily financed through general taxation at a national and municipal level. This refers to investment in hospital care, health centres, and facilities owned by the MoH or municipalities. The MoH has funded capital investment in national health programmes, hospitals, national and regional specialised health institutions, medical education and research. Municipalities raise their own resources complemented by national (central) government funds. On this basis they fund investment in public health centres and state pharmacies within their territory (Albreht *et al*, 2009: 38-39).

In 2000-2006, total healthcare expenditure rose from €1521.2mio to €2574.0mio. National government expenditure as part of this increased from 3.4% to 4.7%, while municipal expenditure decreased from 0.7% to 0.5%. Curative care, medical goods procurement and long term nursing care have accounted for approximately 80% of total healthcare expenditure.[1]

In eHealth, there is some evidence of resources available at a local level for healthcare providers, hospitals and health centres to utilise towards health IT investments (see Suselj, 2005).[2]

4. National eHealth project in 2007-2013

4.1 Background

Origin of the project

IT use in the Slovene health sector dates to the mid-1980s. Slovene healthcare providers have traditionally been responsible for setting up and operating their own systems, usually through direct procurement from industry and without employing their own IT experts. This brought about a landscape of many heterogeneous health informatics applications, facilitating administrative tasks of e.g. record-keeping, payments, in primary and acute care while supported by stand-alone (offline) PCs.

Since the 1990s, e-mail use in appointment bookings and electronic health record keeping has been adopted by some GP practices. A few private pharmacists' and medical doctors' web portals have also been operating since 2000.

[1] These figures have been calculated on the basis of data available in (Albreht *et al*, 2009:46).

[2] During fieldwork a scheme was cited as an example, where a sum of €700 became available to physician teams on an annual basis for IT procurement. This has been introduced by the MoH and the Health Insurance Institute of Slovenia (HIIS).

A project of nation-wide scale, similar to *eZdravje*, was launched in 1995 to facilitate state medical insurance claims management based on the use of smart cards. HIIS has funded and led this health insurance card (HIC) project. Patient and physician smartcards were distributed for simultaneous use at the physician's premises in order to access, exchange and store insurance data on the patient card, using proprietary applications on stand-alone PCs. Patients can update their insurance status and seek specialist care using self-service and information terminals installed and linked to a database server located at HIIS. This project has been supported by draft legislation, a cost-benefit analysis, project planning and evaluation studies.

This infrastructure, managed by HIIS, went live in 2000 featuring 1,946,000 health insurance cards; 20,000 health physician cards; 5,400 card readers; 270 self-service terminals at 218 locations; 1,036 participating institutions providing care; use of symmetric cryptography for electronic communications' security (Trcek *et al*, 2001).

This HIIS network has been viewed as a potential backbone for a national healthcare information system. However, the lack of data formats, communication protocols and e-business process specifications for use in healthcare meant that it remained a *database access* rather than a *data communication* system. A current HIC renovation project aims to address this.

Our interviews at HIIS reveal a key premise upon which the HIC project has been successful. This success was based on establishing a common approach and understanding among insurance and healthcare providers on how to maintain existing business models while introducing IT and software applications developed for use at a national level.

Beyond HIC, a national project titled "Health Sector Management Project" was implemented during 2002-2004, partially funded by the World Bank. This formed the basis for the elaboration of the Slovene eHealth strategy (Albreht, 2009:3).

Main factors stimulating the project

eHealth strategy development for EU member states and related actions by the EC were viewed by domestic stakeholders as (i) an opportunity, as well as (ii) a challenge and requirement that needs to be addressed. The availability of national and, especially, EU funds through the ESF (see section 5 below) is also perceived as a key premise for inciting ideas about a national eHealth strategy and project. Availability of funds helped start discussions among key stakeholders and is thought to have accelerated the process of launching this national eHealth project.

The project is understood as an integral part of the Slovenia's healthcare reform, a highly politicised process aimed at improving the efficiency of the national healthcare system. In addition, the EC has viewed *eZdravje* as a typical example of a "capacity building" project that builds on previous interventions financed by EU pre-accession instruments in Slovenia. However, previous health IT projects were not co-financed by the EU. Our research confirms that domestic stakeholders came to engage with this project in 2007 without substantial prior experience of utilising Structural Funds to implement infrastructure projects.

Stakeholder organisations whose members utilise information in healthcare expressed concrete views on those interesting features of this project. The need to improve the process of gathering epidemiological data and information, and the evidence base available from where to make decisions in planning healthcare

infrastructure and services has been widely acknowledged. Health information is presently aggregated by healthcare providers and is then recorded in their existing IT systems. Exchange and processing of information at a national level based on these systems has been problematic. For example, information needs to be copied onto media for despatch and processing by the National Institute of Public Health, which maintains a number of national health databases.

4.2 Project objectives

The objectives that the Slovene national project aims to meet are the following (SMoH, 2009; see also Albreht, 2009:1-2):

- offer to all healthcare providers, specialists, GPs, pharmacists unified, secure and reliable access to all key patient information via a standardised Electronic Health Record (EHR) and other data sets;
- facilitate better planning and management of the national healthcare system on the basis of good quality, accurate administrative, clinical, and economic data;
- improve access to all necessary information and the ability of citizens to participate in the development of quality healthcare services;
- promote an active role and responsibility of citizens for their health and healthcare services;
- improve access to healthcare for persons excluded due to disability, age or other reasons.

eZdravje was initially designed to comprise five project modules. These are:

(i) three system delivery modules of (a) a national health telecoms network - *zNET*, (b) eHealth portal - *zVEM* and (c) electronic health record (EHR) dataset, components of the national electronic Health Information System (eHIS);

(ii) an organisational module featuring the creation of the National Centre for eHealth, and (ii) a Training and Skills Development module.

Eighteen subprojects and a number of trial, sample or 'pilot' projects fall under each of these modules.

Figure 4.2.1 below depicts these five project modules.

Figure 4.2.1 below illustrates these project modules.

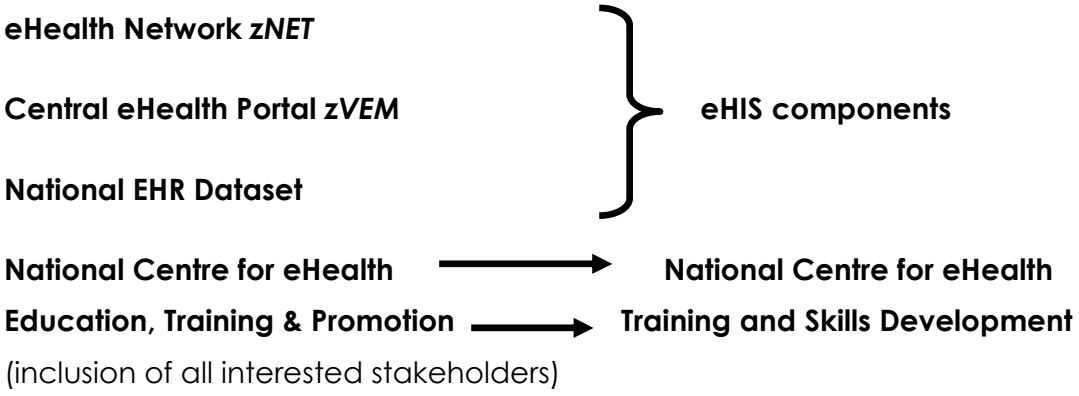

Fig.4.2.1. eZdravje Project Modules (SMoH, 2009)

These modules have been based on specific documentation developed prior to its start. This includes the Slovene national eHealth strategy, the project feasibility study completed in 2007, and the conceptual (high level design – HLD) model of the national eHIS. These documents have been elaborated by the MoH and stakeholder organisations (see section 7 below).

5. Funding and procurement

5.1 Funding scheme

The Slovene national eHealth project (*eZdravje*) spans the period of September 2008 to June 2015. Its expenditure, estimated at approx. €67 million, is funded by the Slovene Ministry of Health (MoH), the European Social Fund (ESF), and other Slovene public funds as follows:

- Slovene MoH ordinary budget: €26 million;
- ESF: €27 million;
- Other Slovene public funds: €15 million.

A follow-up project is anticipated in 2015-2023, of approx. €67 million forecasted expenditure.

This funding agreement occurred as part of a long term plan of needs put together by the main stakeholders in Slovene healthcare. A cost-benefit assessment was completed as part of putting together the project's feasibility study. Some stakeholder representatives suggest PPP was considered as an alternative funding scheme; however, state-industry collaborations are currently understood as not sufficiently mature in Slovenia.

5.2 The Role of the EU and national funding

The use of ESF

Since its inception in 1957 the ESF has had a focus on the development of human resources. In the current programming period of 2007-2013, the EC suggests that the ESF may co-finance administrative capacity building programmes and projects in "convergence" states and regions. Priority areas are identified by individual EU member states. In this case, the Slovene Human Resources Development OP (HRD OP) has included the national eHealth project because of the project aims. Better design of healthcare services and patient empowerment are viewed as people-centred objectives, understood as complementary to active labour market policies.

The ESF is found by domestic stakeholders to have provided fresh impetus to launching the project in 2007. It is further understood to have supported innovation in the following ways:

- Stakeholders have come together in a special project management framework designed to advance the project (see section 7 below);
- The IT industry has been attracted to the project, participating in consultations and bidding for tenders published towards implementing parts of *eZdravje*.

The stakeholder partnership principle of the Structural Funds, reflected in the Monitoring Committee established for each OP, is understood to have been congruent with the special project management framework of this project.

Other EU and national funding instruments

Informants note that there has been synergy, rather than confusion or contradiction, between *eZdravje* and other eHealth-related programmes funded by the Slovene government and the Structural Funds (see SMoH, 2008). Examples cited include INTERREG III / European Territorial Cooperation programmes, epSOS (www.epsos.eu), and eHealth research projects funded by national agencies.[3]

The role of EUREGIOIII has also been highlighted by stakeholder representatives as a vehicle to ensure better coordination of similar projects across EU member states and regions.

5.3 Procurement

Procurement of this national eHealth project is based upon provisions of the "Human Resources Development 2007-2013" Operational Programme (HRD OP). Public

[3] European Territorial Cooperation programmes include www.ita-slo.eu; www.si-at.eu; www.interreg4c.eu and a number of further programmes of different regional foci. Please see www.svlr.gov.si/en/areas_of_work/european_territorial_cooperation/ for a full list. All web sites have been accessed on 28th November 2011.

contracts awarded as part of the OP on projects benefiting from ESF assistance comply with the provisions of the EC procurement Directives 2004/17/EC56, 2004/18/EC57, and Regulation (EC) 1564/200558 (SGOLS, 2007:148).

At the start of the project, the MoH led the preparation of tenders for this project including technical specifications. These tenders were then required to be submitted for approval to the HRD OP Managing Authority. This formal requirement has now been abolished. The HRD OP Managing Authority suggests that this change has been introduced for the project's public procurement to be expedited, due to the delays incurred during 2009-2010.

5.4 Experience with the process: key issues

Stakeholder representatives suggest that the key issues associated with project progress since 2007 have been the following:

- the procurement process – preparation of tender documentation, publication and the associated complaints procedure – has proved to be cumbersome, taking much more time than originally planned;
- key project management decisions adopted through the special project management framework have taken considerable time to be reached and implemented;
- there has been a lack of a fuller engagement with the IT industry as a stakeholder;
- there has been a need for a larger team and setting of project management priorities at the MoH;
- ESF monitoring and reporting have been reported as a "complicated" process, generating additional workload for those stakeholders concerned (MoH, MA).

The EC is viewed by respondents as an important stakeholder in the process. The EC is understood to fulfil the following two roles:

(i) audit of ESF expenditure, overview of progress of the OP and individual projects;

(ii) providing expertise through EU eHealth-related initiatives.

Nothwithstanding some calls for the EU to provide support with managing the ESF part of the project, a more active role in the form of expertise input by EC DGs is not anticipated by most stakeholder organisations. Role (ii) is viewed principally in terms of expertise input during the planning stage of projects, and review of outcomes towards sharing best practice.

The next sections of this report discuss specific dimensions of the project and their impact on progress until the end of 2011.

6. *Contractual arrangements*

The main contractual arrangement supporting *eZdravje* is the HRD OP agreement concluded between the EC and Slovene government. Priority Axis 5, "Institutional and Administrative Capacity", includes Activity 4, "Healthcare in the Information Age" that defines *eZdravje* as a project (SGOLS, 2007: 121-123).

In addition, an inter-ministerial memorandum has been signed between the MoH and the Ministry of Public Administration concerning responsibilities arising from the project, notably the ownership of telecoms equipment bought for use in the national health telecoms network - *zNET*.

A central problem associated with the relative lack of progress of *eZdravje* is identified in the process of designing, issuing public tenders and awarding project contracts. Following pre-stage consultation with the IT industry, the MoH issued tenders designed by a team of experts working as part of the *eZdravje* project management framework.

IT companies and other stakeholders have found tenders to be of too large scope, lacking clear specification, and focusing on a single technology to deliver services. Smaller companies felt unable to contest one particular tender deemed important to the project, despite their involvement in pre-stage consultation. This tender was legally challenged and was then withdrawn. In another example, the MoH received written complaints on a tender because it was thought to be too narrowly specified.

Our informants suggest that the tender design and contracting process did not proceed as originally thought. This is attributed to delays associated with launching the project in 2007 and lack of a sufficient number of experts in Slovenia. Some problems are also reported with providing sufficient budgetary resources to support pilot projects engaging an appropriate number of users.

Despite these issues, most stakeholder representatives feel that the process of procuring the different constituent parts to build and operate each of the project modules has stimulated innovation. Suggestions on how the process could be enhanced include:

- the adoption of a more open approach to designing tenders for the project;
- expertise input to tender design on
  - (i) using several different technologies that may support a service;
  - (ii) possible design architectures;
  - (iii) full project lifecycle costing.

7. *Inter-organisational relationships*

This national eHealth project has progressed based on a special project management framework. The establishment of this framework has been led by the MoH. The purpose has been to progress the project on the basis of consensual decision-making among key professional groups, avoid resistance to the

introduction of eHealth services, and reap the benefits of greater efficiency and quality in health service provision. This approach was chosen at the start of the project.

As mentioned previously, eZdravje has been based on five key pieces of documentation, namely:

- the eHealth strategy document;
- the national eHealth information system (eHIS) conceptual model;
- the *eZdravje* Feasibility Study;
- the *eZdravje* action plan;
- the *eZdravje* subproject design documents.

The strategy document was elaborated by the MoH in collaboration with healthcare stakeholder organisations and was published in December 2005. The national eHIS conceptual model was put together in 2007. Based on these two documents, the *eZdravje* Feasibility Study, action plan and subproject design documents were completed in 2009.

Through this process the project's management framework was developed to feature consultation and consensual decision-making among key stakeholder organisations. These have come together in five committees and working groups (see also SMoH, 2009; Krapez & Kronegger, 2007:48):

(i) the Council for Healthcare Informatics – **the Council**;
(ii) the *eZdravje* Project High Level Steering Group – **the HLSG**;
(iii) the Committee for Healthcare Informatics Standards – **CHIS** or ***OZIS***;
(iv) special, ad hoc working groups developing system architecture specifications for pilot projects, subprojects and system modules;
(v) the *eZdravje* ***Collegium***.

Consultation and consensual decision-making has involved deliberation and negotiation on decisions concerning technology adoption, strategy and standards-setting among stakeholders in the committees (i)-(iii) above. Specifically, five stakeholder organisations were invited to by the Slovene MoH to collaborate with the Ministry from the start. These include the:

- HIIS, www.zzzs.si;
- National Institute of Public Health of Slovenia, www.ivz.si;
- Association of Health Institutions of Slovenia, www.zdrzz.si;
- Medical Chamber, www.zdravniskazbornica.si;
- Slovene Chamber of Pharmacy, www.lzs.si.

In the **Council**, stakeholders are represented by their Chief Information Officer (CIO) or equivalent official. The **HLSG** featured deliberation and negotiation among Chief Executive Officers (CEOs) or equivalent. Experts in technological standards convened in **CHIS** and ad hoc, special working groups to discuss and reach

decisions on the adoption of national technological standards, in formal collaboration with the Slovenian Institute for Standardisation (SIST), the national organisation responsible for standards-setting. Lastly, the ***Collegium*** is the project management team staffed by and located at the MoH, bestowed with the day-to-day project management tasks and led by the *eZdravje* project manager.

This framework engaged a total of forty five (45) experts from the afore-mentioned organisations and others, e.g. Ministries of Public Administration, Higher Education, Science and Technology (SMoH, 2007). Professional stakeholder organisations, e.g. the Medical and Pharmacy Chambers, the HIIS, aggregate interests and perspectives of their members, adopt positions on various aspects of the project, and represent these in sessions of committees (i)-(iv). Other organisations, such as ProREC, the Slovene national institute promoting the introduction of the European EHR, participate in the special, ad hoc working groups initiated by CHIS to elaborate technical specifications for pilot projects and subprojects.

The MoH adopted the role of leading negotiations among stakeholders. The *Collegium* project manager chaired meetings, promoted consensus and introduced their own domestic and international expertise towards the formulation of key project decisions. Furthermore, the *Collegium* has come in contact with care professionals and elicited their feedback through the Education and Training module of *eZdravje*. The focus of seminars and workshops organised has been to familiarise care professionals with the system modules the project has aimed to deliver, the implications for their work, and elicit their feedback.

The frequency of communication among stakeholders is noted as follows. The HSLG convenes four times a year. CHIS and special working groups convene as and when required, prompted by decisions reached at the HSLG and the Council. The *Collegium* team has been reported to meet once a week. In addition, various conferences and stakeholder meetings were organised at the start of the project. In late 2010, this activity of keeping stakeholders together, and the pace of project developments more generally, are understood to have declined.

This structure has operated in tandem within the management structure of the HRD OP which includes the Managing Authority Monitoring Committee, payments' control and evaluation, as per the requirements of EU Cohesion policy regulations for 2007-2013. Other than joint memberships of stakeholder representatives in committees (i)-(iii) and the OP Monitoring Committee, no formal links have been identified between the MA, MC and the committees discussed above.

The feasibility study and eHIS conceptual model have been prepared through consensual deliberation involving 6 organisations – the MoH, HIIS, Association of Healthcare Providers, National Institute of Public Health, Medical Chamber, and the Chamber of Pharmacists. The IT industry was engaged in consultation sessions after these key documents were in place. IT vendors were invited to conferences and roundtable discussions organised by the main 5 stakeholders to offer feedback to the design of the *eZdravje* modules and projects. Despite this, initial project tenders were challenged by IT providers who felt unable to contend them. A fuller engagement and involvement of the IT industry through their representative organisation was then sought by the MoH as a remedial measure. IT vendor feedback suggests it would be helpful to bring together health and IT specialists

when designing key aspects of the project; decisions seemed to have been reached in an isolated manner.

The consensual approach to project management seems to have been met with difficulties while attempting to successfully include the IT industry in the process. Our research is suggestive of a problematic, somewhat antagonistic relationship between some stakeholders leading the project and the IT industry. Scepticism and uncertainty are expressed by informants in leading organisations regarding ways in which IT companies may choose to exploit poorly designed tenders and alter the course of the project. At the same time, limits are identified to the IT industry's contribution to tender design during consultation due to competitive pressures. Companies may choose not to share their latest ideas or innovations due to the risk of having them reproduced by competitors.

8. Innovation

8.1 Innovation during the planning phase

Innovations identified as having occurred during the **planning phase** by expert informants interviewed for this report include:

- the project's clear deliverables and module-based structure including system and organisational modules described in Section 4.2;
- the consensual decision-making framework detailed in Section 7, viewed as having facilitated engagement and involvement of key stakeholder organisations;[4]
- alternative business models considered to help engage small physician practices and private healthcare with eHealth services offered through the project.

8.2 Innovation during the build phase

Innovations identified by informants as having occurred during the *building phase* of the *eZdravje* project include:

- the pilot projects launched as part of *eZdravje*, e.g. *Lab-Poštar*;

These are thought to confirm the suitability of specific ICT-based solutions offering eHealth services amongst organisations within a local health system, and generate useful experiences and learning towards scaling up and integrating service at national level;

[4] One informant has found that this process has stimulated a more active pursuit of their organisation's mission, namely the aggregation and representation of interests and viewpoints of their members.

- the design of the national EHR.

These innovations are thought to prepare the ground for large-scale implementation and support the improvement of the evidence base.

Local IT experts interviewed expressed the view that the decision to build and operate a separate private network infrastructure for the national eHealth telecoms network *Z-NET*, including newly bought WAN switching equipment and leased lines as private virtual circuits (PVCs), has been rather unwarranted and not reflecting the state of the art. The term 'WAN' refers to wide area network equipment designed with the appropriate capacity to support telecoms services at a regional or national scale. Market prices suggest this solution is more expensive than an internet or cloud computing based architectures. Stakeholders commented that this has translated to a higher premium to use eHealth services. This, while affordable to healthcare providers, e.g. hospitals, has been deemed unsustainable for small physician practices (GPs and others).

There is some understanding that concerns about privacy, security concerns and the requirements of the current EU privacy protection regime led to this decision. However, other technologies based on encryption, internet or cloud computing are thought of as capable of providing the same level of service including data privacy and security. The view that system module design and tenders should be "technology-agnostic", i.e. not be based on an explicit choice of technology, has also been expressed by IT experts interviewed. This is viewed as a means to enhance competition in a market already stimulated through the project.

8.3 Innovation during the operational phase

Innovations anticipated by our expert informants during the operational phase of the eZdravje system modules include:

- collaboration between ministries in operating the eHealth telecoms network;
- the operation of the national EHR, and the perceived right and responsibility of individual citizens to access and keep their record updated;
- use of the national electronic health insurance (HIC) user terminals for authentication.

Collaboration between the MoH and Ministry of Public Administration is anticipated as the *Z-NET* equipment and proposed leased lines come under the ownership of that Ministry.

9. Overall project performance and future challenges

9.1 Project progress

Tenders were prepared for the national eHealth telecoms network, national eHealth portal and pilot projects in the spring of 2010, a year after the feasibility study was completed. The time taken to publish these, and subsequent delays associated with some of them being recalled and legally challenged are understood as "significant" delays by stakeholders. Certain pilot projects progressed; *Lab-Poštar*, a pilot electronic personal health data exchange between laboratories and physicians by e-mail, moved into implementation during 2010. Work started on the EHR in late 2010 and resumed in 2011. Creating a team of experts to form the National Centre for eHealth also commenced, with them based at the MoH in the first instance. The Education and Training module progressed according to plan.

Since mid-2010, the MoH has not been providing updates on project progress to IT vendors. The high estimated cost of using eHealth services led the Medical Chamber to look at alternative business models so that physician practices would eventually be able to utilise these. It also seems that the management of connections to the network is to be managed separately from other parts of the project currently managed by the MoH-based *Collegium*.

Larger and small IT vendors have intensely contended in their bids to take on different parts of the project's implementation. After tenders were challenged, the MoH thought that these should be redesigned so that they are become more accessible by different providers. Engagement with the IT industry, albeit belated, has aimed at tenders becoming accessible by larger and small IT vendors, generating good proposals for the MoH to choose from and advance the project.

9.2 Current stage of project

By mid-2011, one pilot project, *Lab-Poštar*, the *zNET* network implementation, and the Education and Training module had progressed. The National Waiting Lists and Teleradiology pilot projects, eHealth portal and EHR platform were lagging behind. Representatives of domestic stakeholders understand the project to be delayed due to the inactivity of the MoH in 2010 in the first instance. The EC sees the project to be delayed due to the consensual project management framework taking time to deliver key decisions; another reason identified the project's relevance to the wider Slovene healthcare reform.

Research for this report suggests further that the two professional stakeholder organisations engaged in the project from the start, the Medical Chamber and Chamber of Pharmacy, felt that their views regarding specific aspects of the project had not been adequately considered in the course of formulating and implementing decisions.

The new Health Minister appointed in August 2010 requested a project update and audit. The Minister has reportedly consulted with all stakeholders on ways that could make eHealth services sustainable after 2015. At the same time, the Medical Chamber led discussions on alternative business models aimed at engaging small physician practices with the project and services to be offered.

Following the appointment of a new project manager in February 2011, the strategy document and *eZdravje* Feasibility Study were revised. The main change concerns the *zVEM* portal, which has now been discontinued. The MoH led this process while acknowledging recent feedback by professional stakeholder organisations on the management of the consensual process by the previous *Collegium* leadership and resulting level of stakeholder involvement. Improvements have also been introduced based on new knowledge and experience in the use of ICT for health.

Following these steps, committees (i)-(iii) have reconvened to agree EHR standards to be introduced. A new pilot project has also been introduced, ePrescription, and is scheduled for implementation in regions where system platforms of stakeholder organisations are already interconnected. However, a new project manager was again appointed at the MoH to lead the *Collegium*, in September 2011.

9.3 Future challenges

Informants interviewed have identified the following areas where uncertainty is currently felt with regard to the short and medium term future of *eZdravje*:

- shortage of qualified staff to manage the project at the MoH and other organisations, acknowledged by nearly all stakeholders;
- shortage of experts with the appropriate qualifications and experience required to staff the afore-mentioned committees and collaborate to advance the project, acknowledged by nearly all stakeholders;
- legal action by IT companies on future tenders of the project;
- pressures on the MoH ordinary budget due to ongoing financial crisis;
- EU funds not spent on time and risking withdrawal, due to lack of progress;
- changes in government and policy.

Overall, stakeholder organisations look to the MoH for new initiative towards advancing the project beyond its current stage. Perceived inactivity on the part of MoH is now understood to have an impact on related work initiated by other organisations. Most representatives of domestic stakeholders interviewed feel that the project has been rather unduly delayed. The difficulties with a project aimed at introducing innovation using IT in healthcare and forming part of a politicised national healthcare reform process are appreciated. However, an expressed need now emerges for leadership to take the project forward.

10. Conclusions

Stakeholders understand the Slovene national eHealth project to be delayed. Reasons cited relate to the inactivity of the MoH for a large part of 2010, lack of expertise to inform project tenders, the time taken for decisions to be formulated

through the consensual project management framework, and the impact of the wider Slovene healthcare reform. However, our analysis suggests that the reasons for the project's current situation extend beyond these.

The main area for improvement seems to be the link between stakeholder consultation and subsequent contractual arrangements. The consultation process among different stakeholder professional groups has yet to translate to clear, anticipated and well understood contractual arrangements among stakeholders. The chosen consultation and project management approach of consensual decision-making has been met with difficulties while engaging important stakeholders such as the IT industry, the Medical and Pharmacy Chambers.

In the former case, lack of expertise to inform tenders, belated engagement with IT firms, and the limits of such due to the competitive behaviour of firms vis-a-vis project tenders, meant that *eZdravje* tenders lacked clear and anticipated specifications. After tenders were challenged, the relationship between IT and stakeholders leading the project became increasingly problematic. In the latter case, the MoH *Collegium* initiative and leadership on technical aspects of the project has seemed to be incompatible with the function that the Chambers and other similar national organisations perform, namely the aggregation of expertise, interest and views of their members.

In this context, the choice of technology and implications for some of the stakeholders are of special importance. A key example is the decision to operate the national eHealth telecoms network as an end-to-end private network composed of leased lines and switching equipment owned by the Ministry of Public Administration has meant that eHealth service costs would be unsustainable for small physician practices in the first instance. At the same time, the HIC system renovation project aims to deliver an open architecture network with end-to-end security. This choice of technology has seemingly alienated a key stakeholder group, lost potential economies of scale and scope arising from using the existing HIIS infrastructure, and started to impact related work of other stakeholders.

Overall, our research suggests that consensus formation is a process contested by domestic stakeholders. Stakeholders invited to engage from the start, as well as those engaging later, seek to influence the course of the national eHealth project and be involved in ways that maximise their benefits. Decisions have been contested among organisations representing professional groups and the *Collegium* chair - project manager. The lack of domestic experts available may have led successive *Collegium* chairs to wish to introduce their own expertise, as their appointments were made based on experience and qualifications. A management style emphasising moderation, foresight and expertise contribution to facilitate discussion on the part of the chair would have been more amenable with national professional stakeholder organisations, their representatives, and interests.

11. Recommendations

Based on the conclusions derived above, priority should be given towards bringing all stakeholder professional groups and organisations back to the project's fold. Consultation among them needs to be enhanced and managed towards delivering clear contractual arrangements among them, on which the project may then advance successfully. Related issues such as the lack of expertise to inform

tender design and specifications, and business models making eHealth services sustainable and accessible by all stakeholders need to be considered in tandem.

To this end, the report offers the following recommendations that may be of use to stakeholder organisations in Slovenia, and equally to policymakers and stakeholders to any national eHealth project or programme. These include the following:

A. ***Launch an initiative to successfully include the IT industry, and the Medical and Pharmacy Chambers, in the project consultation process, redressing the balance among contributions to the project among different professional groups;***

B. ***Endorse and develop ideas on alternative business models, using full cost analysis methods, to make use of eHealth services affordable for GPs and physician practices;***

C. ***Identify domestic and international experts to assist with tender design and specifications in line with the afore-mentioned consultation process;***

D. ***Collaborate closely with HIIS, the Medical and Pharmacy Chambers, and the National Institute of Public Health, to engage stakeholders locally and complete further pilot projects successfully;***

E. ***Consider cloud and internet-based solutions on how to connect the national eHealth telecoms network and other existing databases, with the view to offer advanced data processing and validation services - e.g. data fusion;***

F. ***Design and activate a programme of events, e.g. conferences, training and other, to keep stakeholder professional groups engaged and interested in the project, in line and in tandem with the project's consultation process.***

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