FUNCTIONALITIES AND USE OF THE ZVEM PATIENT PORTAL AND THE CENTRAL REGISTRY OF PATIENT DATA

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Abstract. Introduction of eHealth is one of the key long-term goals of digitalising the public sector in Slovenia. Despite certain challenges, great progress has been made in the field of eHealth solutions. The paper presents an in-depth analysis of the functionality and use of the Patient Health Portal zVEM and the Central Registry of Patient Data (CRPD) in recent years, especially during the COVID-19 epidemic. The comprehensive methodological approach was based on the literature review, the examination of project documentation and technical specifications, the expert opinion of eHealth managers, and actual statistics from administrative and business intelligence modules. The results imply that during the epidemic the zVEM took on an important role in informing and raising public awareness. From the patient's point of view, the zVEM is certainly one of the major gains in recent decades. Accordingly, the use of the zVEM and CRPD has been growing exponentially. However, although eHealth solutions have undergone unprecedented development in recent years, much effort will have to be made by all stakeholders in the future, and additional human and material resources will have to be provided if we want to maintain progress and perhaps even accelerate the development of healthcare informatics in Slovenia.

1   Introduction

The effective and comprehensive digital transformation of the Slovenian healthcare system is one of the fundamental changes that should contribute to greater success in dealing with the numerous challenges facing Slovenia's healthcare sector. The experiences of developed countries indicate (Bokolo, 2021; Arcury et al., 2020; Petrova, Balyka & Kachan, 2000) that successfully implemented projects of digitalising healthcare have exceptional strategic importance for the further development of the healthcare system, and they also point to broader implications centred around increased social well-being and economic growth (European Commission, 2018). The project of Slovenian healthcare digitalisation (eZdravje or eHealth), which follows the national, European and WHO guidelines, was one of the key long-term goals of the public sector in Slovenia. The entire basis of the eHealth project and the development guidelines are based on principles that were defined in the overarching document "eZdravje2010 Strategija informatizacije slovenskega zdravstvenega sistema 2005-2010" (Ministry of Health, 2005). The National Institute of Public Health (NIJZ) took over the management of the eHealth project from the Ministry of Health in 2015.

An exhaustive review of conditions in the field indicates that the difficulties encountered right from the outset in the project of digitalising Slovenian healthcare (eHealth) arose in part from the technical and technological characteristics of the existing, fragmented healthcare information systems, which are a consequence of the uncoordinated development in the area of health informatics in recent decades. On the other hand, the responsibility for the current state of affairs can be attributed principally to the decision-making authorities that left the development of healthcare informatics in this period up to individual initiatives, needs and the particular interests of individuals at the healthcare institution (or even department) level, without unified strategic guidelines for the whole country. Moreover those in charge in this period were not able to promote development and fulfil the digitalisation project through the provision of stronger political (financial, HR, organisational) support and the formulation of a modern and consistent strategy in this area.

The consequences of these factors are reflected in specific challenges that the NIJZ identified during the activities to date aimed at the universal digitalisation of Slovenian healthcare and implementation of the eHealth system, which are:

- a lack of preparedness (administrative, technological, organisational, procedural, security, etc.) of certain healthcare providers for the appropriate use of the eHealth system;
- lack of harmonisation of healthcare professionals with regard to substantive issues (e.g. the healthcare services code list, access to health documents);
- the narrow orientation of individual stakeholders towards their own professional fields and goals, without an awareness of the co-dependence of all stakeholders in the healthcare system;
- a lack of competent experts in the field of informatics at healthcare providers who could ensure adequate maintenance and operation of the eHealth system;
- inadequate funds for digitalisation of healthcare providers and for the NIJZ, which works to ensure the development, maintenance and upgrading of the central national eHealth system.

Despite these challenges, the lack of unified strategic documents and inadequate investment in the area of healthcare informatics, in the past four years great progress has been made in the development and implementation both of certain fundamental infrastructural solutions and specific eHealth user applications. In view of the dynamic of events, starting with the publication of the first strategic document in the area of digitalising healthcare in 2005, the implementation of the eHealth system, which has been carried out since the beginning of 2016, represents an important milestone, which has without doubt determined the further development of Slovenia's healthcare system. It should be noted here that despite the measurable successes of the eHealth system in the recent period, as evidenced both by national evaluations (Ministry of Public Administration, 2019) and international evaluations (European Commission, 2019), where in view of the use of eHealth Slovenia was put in sixth place, while with regard to the use of ePrescription it is in third place among EU Member States, eHealth still does not enjoy the kind of distinction that it merits.

The NIJZ has been continuously working to provide improvements and upgrades to the system. But the years 2020 and 2021 are truly special in this respect, since the COVID-19 epidemic changed the modus operandi dramatically (Stanimirović & Matetić, 2020; NIJZ, 2021a), as all the upgrades needed to be developed and implemented in the shortest possible time. Over the past two years the zVEM and the CRPD have stood out in this regard, and thus these two eHealth solutions, their

development, functionalities and use will be described in more detail and analysed below. The impact of COVID-19 on the zVEM and CRPD will be discussed in this context.

2 Methods

This paper presents an in-depth analysis of the functionalities and use of the zVEM and the CRPD, and additionally investigates how the COVID-19 epidemic has affected the development and use of the zVEM and CRPD solutions. This is an extreme example of the agile development process in the field of eHealth solutions in Slovenia, which was highly accelerated during the COVID-19 period, suggesting that the epidemic was a particular opportunity for rapid advancement in the digitalisation domain. The in-depth analysis performed in this work was based on the case study research methodology (Yin, 2018; Kljajić Borštnar, 2021), which included an in-depth study of the field and its critical analysis. On the one hand, the analysis was conducted on the basis of a literature review in the field (Tulu et al., 2021; Glöggler & Ammenwerth, 2021), and examination of project documentation and technical specifications for the zVEM and CRPD. On the other hand, it was based on the observations, experience and professional opinions of experts at the NIJZ who are managing the eHealth system (including the zVEM and CRPD), along with actual statistical data on the use of the zVEM and CRPD from the administrative and business intelligence modules (Sim & Waterfield, 2019). The selection of the research method was based on the particular features of the research field and the fact that the entire area of healthcare digitalisation in Slovenia is still in a relatively early stage, so there is just a narrow circle of experts with appropriate knowledge and understanding in this field. This methodological approach enabled both an insight into the theoretical and technological background of these kinds of digital solutions, and an empirical overview of the actual state of affairs, development stages and use of the zVEM and CRPD in the Slovenian healthcare system and in the wider social environment (Mohajan, 2018). The collaboration of experts from the NIJZ in the research enabled not just an insight into the technological/technical, statistical and administrative aspects of the operations of the zVEM and CRPD, but also an objective and thorough understanding of the user aspects, since the experts from the NIJZ are very familiar with the user experiences of patients and healthcare workers, and their satisfaction with the zVEM and CRPD. An in-depth analysis of the functionalities and use of the zVEM and CRPD, in terms

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of the literature review in the field and examination of project documentation and technical specifications for the zVEM and CRPD, was conducted in the first half of 2021. Structured discussions with the NIJZ experts and the acquirement of statistical data from business intelligence and administrative modules were carried out in the period from June to December 2021.

This paper focuses on the zVEM and CRPD principally because of their usability and importance both for patients and for healthcare workers, and also because of the major progress in the past two years. The synthesis of findings from the literature, user functionalities from the technical documents, statistical reports and the views of the NIJZ experts, enable the formulation of credible conclusions based on verifiable data regarding the highlighted research aims.

3 Results

3.1 zVEM

The greatest development in terms of the digitalisation of healthcare in Slovenia in the past two years has been observed in the zVEM (health - all in one place) system (Stanimirović, 2021). The zVEM was designed as a linking service, the central hub of primary eHealth solutions for patients, for enabling secure and efficient access to their referrals, prescriptions, specialist reports and other documents, and online booking of appointments to secondary services and reviewing waiting periods (Janet & Stanimirović, 2020). From the patient's point of view, the development and establishment of the zVEM is certainly one of the major gains in recent decades (van Gemert-Pijnen, 2011). Technically the system was set up on the conclusion of the eHealth project in November 2015, while full use, with the possibility of registration, was ensured at the beginning of 2017 (Rant et al., 2018). Access to all functionalities is possible via the SI-PASS system with a digital certificate or smsPASS. The zVEM provides users with secure and reliable access to their data in the eHealth databases and access to eHealth services. It also offers users current content in the area of public health. It contains certain functionalities, online training and surveys, and also allows zVEM administrators to post important messages (Rant, Stanimirović & Žlender, 2019). First and foremost the zVEM is intended for patients, and is accessible at: https://zvem.ezdrav.si/ (NIJZ, 2021b). After logging on, users can review their data and the data of their children aged up to 15 years. They can also

sign up for notifications about prescriptions and referrals. The zVEM application for smartphones has been in use since July 2021, and this offers rapid and user-friendly access to the majority of services.

Healthcare providers send out specialist reports, discharge letters and data for the patient summary. The databases contained within the eHealth system are used to complete data on prescriptions (eRecept), referrals and appointments (eNaročanje) and vaccinations (eRCO). Insurance data is transferred from the national Health Insurance Institute (ZZZS) files. Demographic data is transferred from the Register of Patients and Spatial Units (RPPE), which is regularly updated from the Central Population Register (CRP) and the national Survey and Mapping Administration. Patients themselves can also express their consent, and can make vaccination bookings (Figure 1).
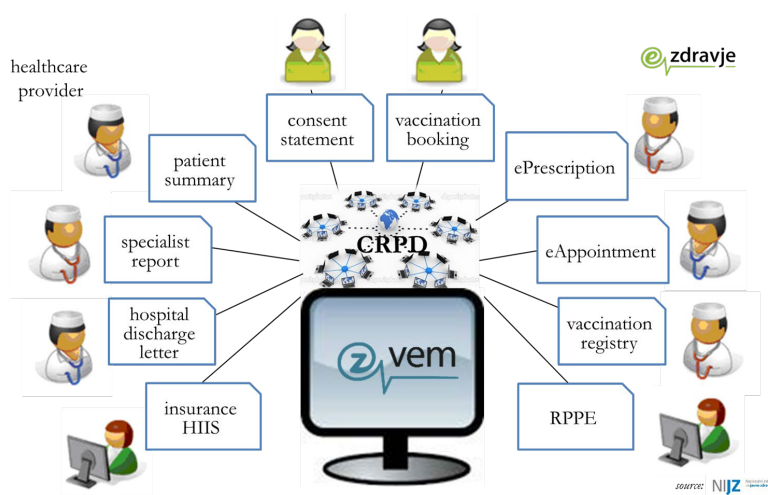

Figure 1: Display of data on the zVEM

A major added value of the system is being able to view one's own health documents. Patients can look at specialist reports and hospital discharge letters, including the results of COVID-19 testing, and they can also print out the EU Digital COVID Certificate (EU DCC; European Parliament, 2021). These documents can be viewed by attending physicians in their own information systems, and this means patients are no longer required to bring specialist reports from one healthcare provider to another.

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Patients can view their patient summary for themselves and their children (aged up to 15). This is a structured record comprising the most important health data necessary for high-quality health treatment, and this is part of the CRPD.

The summary of written statements of the patient's consent contains written statements of this, and the patient can also apply a block on data being viewed.

Patients can view data on prescribed and dispensed prescription medications. For each prescription, information is given about the prescribed medication and its dispensing in pharmacies.

The patient can see their data on referrals and appointments, and make bookings for desired health services, as well as for vaccination against COVID-19. Appointments can also be cancelled using the system. Within the eAppointment (eNaročanje) service, all citizens are able to see waiting times and free slots at healthcare providers as reported by them.

3.2   zVEM plus (zVEM for healthcare providers)

The zVEM plus portal enables the capture of data and its processing, and the issuing of various reports that healthcare providers must send out. It is intended for providers that do not use their own information system for this. The investment was financed by the European Union from the European Regional Development Fund as part of the EU-wide response to the COVID-19 pandemic (Janet & Stanimirović, 2020).

3.3   Data on use of the zVEM

The zVEM was put into use successfully at the beginning of 2017, and its use experienced a major step forward in 2020 and again in 2021, with the possibility of printing out COVID-19 test results and vaccination status, along with the European Digital COVID Certificate. The first digital vaccination certificate could be printed out on 19 March 2021, while the EU Digital COVID Certificate (EU DCC) could be printed from 24 June 2021. Since 13 July 2021 the zVEM application has also been available to mobile phone users, and users have been able to download the application for verifying the EU DCC since 5 August 2021.

During the epidemic, the zVEM portal took on an important role in informing and raising public awareness. In December 2020 the portal started posting microbiological results from the CRPD, including the results of rapid and PCR tests for COVID-19. This signalled a rapid growth of users on the portal. For several years the number of registered users remained relatively low, until the portal became an important tool for obtaining documents related to health and COVID-19. A major increase was observed with the possibility of printing out the EU DCC in June 2021 and with the zVEM application for smartphones in August 2021 (Figure 2), and the number of registered users reached 409,900 in 2021.

The number of single visits to the zVEM started to grow exponentially with the introduction of test certificates and certificates of COVID-19 vaccination, and especially with the possibility of printing out the EU DCC in July 2021 (Figure 3), with a total of 23,975,212 visits recorded in 2021.
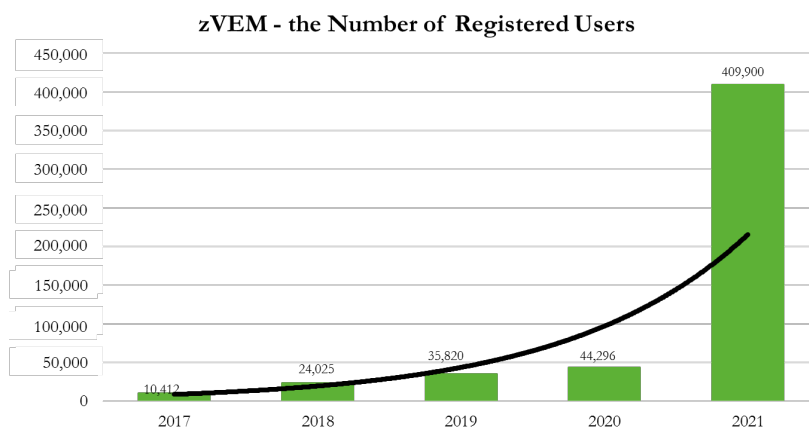
zVEM - the Number of Registered Users

Figure 2: Growth in the number of registered users of the zVEM by year

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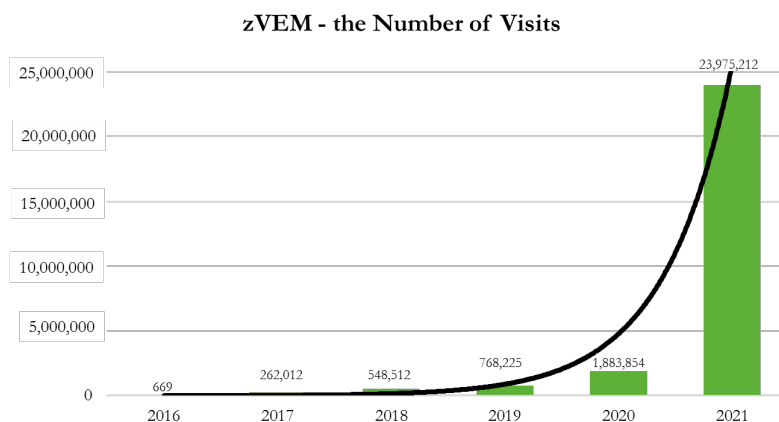**zVEM - the Number of Visits**

Figure 3: Growth in the number of visits to the zVEM by year

The zVEM plus (for healthcare providers) already had 101,581 users at the end of 2021.

The growth in users of the zVEM is welcome and essential for the successful development of eHealth and the connectivity of services. The fact is that the zVEM was designed six years ago, so the backup systems and databases will need upgrading if it is to be ready for the coming challenges and for the unrestricted operation of the portal in the future.

The zVEM Patient Portal surely delivers significant benefits to all stakeholders in the Slovenian healthcare system. In addition to the basic benefits of access to eHealth solutions and medical documentation already mentioned, the zVEM Patient Portal is a vital instrument for patient empowerment and directing public health initiatives and communication with the public, especially during the critical time of the COVID-19 crisis. According to the research findings, patients stressed the relevance of a sense of power and control, and thus the ability to play an active role in the entire treatment process due to the ongoing availability of their health data. In terms of the zVEM Patient Portal's involvement in public health initiatives, it has shown to be a very strong instrument with high population penetration and substantial mobilisation potential, since public trust in the information and epidemiological recommendations provided on the zVEM Patient Portal is rather high. The zVEM Patient Portal, on the other hand, allows for the interchange of

relevant medical documents among healthcare providers, alerts healthcare workers about potential patient COVID-19 infections, and so helps to reduce the incidence of these in hospitals, nursing homes, and the general public.

Other systemic benefits provided by the zVEM Patient Portal, according to participating experts, include significant financial savings, simplified and more effective procedures in terms of prescribing and dispensing medications and making patient appointments, better quality, security, and standardisation of the processed health data, and shorter waiting and consultation times between general practitioners and specialists.

3.4   CRPD

The data displayed via the zVEM is drawn from the CRPD. Today, the CRPD is the most complex public information system in the country, the eHealth database on patients with permanent or temporary residence in the Republic of Slovenia. Data is processed in the CRPD so as to enable providers to have access to data, to exchange data for providing medical care and autopsy services, and for the purpose of updating health documentation data. Access to data in the CRPD is defined in the document Pravilnik o pooblastilih za obdelavo podatkov v Centralnem registru podatkov o pacientih (Rules on authorisations for data processing in the Central Register of Patient Data, Ministry of Health, 2021a).

The CRPD comprises the RPPE, health documents and the patient summary. Demographic data in the RPPE is provided from the CRP and the national Survey and Mapping Administration. Health documents are transferred from the information systems of healthcare providers.

3.5   Data on use of the CRPD

Sending data to the CRPD is obligatory under the Health Care Databases Act (ZZPPZ, 2021), and thus all healthcare providers are required to use this system. Data is also submitted by concession holders and private operators without a concession.

Data on the number of documents in the CRPD point to a major jump in 2020 and continued exponential growth in 2021, with the figure reaching 23,975,212 (Figure 4).
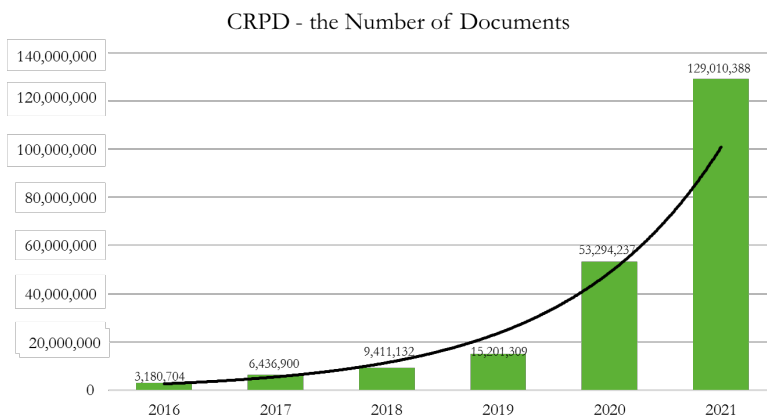

Figure 4: Growth in the number of documents in the CRPD by year

3.6   Development of new functionalities and features

The zVEM and CRPD are constantly being developed and upgraded, and while this increases their wider usability, it also inevitably increases their complexity.
All the upgrades needed to be developed and implemented in the shortest possible time. For some solutions we could use already existing ideas with adjustments, while some needed to be done from scratch. These developments would not have been possible without previous work on introducing, maintaining and developing the core services of the zVEM CRPD, and other eHealth solutions.

4   Discussion

The research results revealed that the COVID-19 epidemic had a major impact on the development and use of the zVEM and CRPD solutions. During the epidemic, use of the eHealth system grew in leaps and bounds, and in some areas increased more than tenfold (Doraiswamy, Abraham, Mamtani, & Cheema, 2020). Due to the growing requirements of users and needs of the system (patient needs, public health needs, the needs of healthcare providers, the needs of healthcare policy), numerous

existing features were upgraded, and many new solutions were developed. All this placed great pressure on the insufficient number of staff, and currently just 15 are working in the area of eHealth. This seriously impacts the eHealth budget, since upgrading and developing new services requires both initial investment costs and long-term costs for maintenance and for recruiting new staff members who will ensure the operation of these systems. The COVID-19 epidemic clearly illustrated the importance of the eHealth system for the Slovenian healthcare sector, since it can be asserted without doubt that without the eHealth system individual segments of the healthcare service in Slovenia would have collapsed (Lee and Lee, 2021), and a major portion of the system would be seriously crippled and limited in its operations. The greatest harm in such a situation would be suffered by patients (Turer et al., 2021; Guitton, 2021).

The analysis conducted in 2019 by the Ministry of Health shows that the healthcare system contains one of the largest sets of information systems in Slovenia. Various healthcare information systems are used in approximately 26 hospitals, 60 health centres and more than 1,500 clinics in the public health system. However, other countries invest on average four times as much as Slovenia in healthcare informatics. The proportion of spending on informatics relative to total income is 1% in Slovenia, while the international average is 3.9%. In 2018, according to the Hospitals Business Report there were 21,334 persons employed in all hospitals in Slovenia, of whom just 85 were IT specialists, this being 0.4% of all employees, while the international average in healthcare is 2.8%, meaning that we differ greatly in terms of professional staffing in this regard.

Data in the area of using the eHealth system is encouraging, since it points to the eHealth system becoming increasingly established in the everyday operations of the Slovenian healthcare sector, and this is indispensable in the context of an epidemic (Sust et al., 2020). In order to maintain the encouraging trend, and in the context of further development and even more effective use of the eHealth system in the future, further activities need to be implemented in the Slovenian healthcare sector.

The priority tasks in the area of eHealth are as follows:

- drawing up an eHealth strategy (including the concept of remote health or telemedicine) and overhauling the legal basis for the operation of eHealth;

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- raising the level of use of the eHealth system by end users;
- improving the quality of operation of the systems, and their comprehensive maintenance and upgrading in line with identified needs and legislative requirements;
- development and implementation of new and supplementary eHealth features in line with established needs;
- allocating additional resources (material and human) for maintenance and development of central national eHealth system managed by the NIJZ, and digitalisation of the operations of healthcare providers;
- encouraging all healthcare providers to ensure complete and consistent submission of all documents and data to the CRPD (with the aim of creating and ensuring all the advantages of electronic health records);
- encouraging all healthcare providers to send accurate data on waiting periods to the central eAppointments system, and establishing info-points for patients to make appointments;
- promotion of eHealth and the opportunities offered by the eHealth system.

5 Conclusion

Since the completion of the project in 2015 the eHealth system in Slovenia has undergone unimagined development. This development has been particularly intense during the COVID-19 epidemic. Some experts even claim that health informatics has advanced as much in the last two years as it would have advanced in ten years under normal circumstances. It is not just the systems that have developed, but their use has also increased more than tenfold. This in turn has brought up difficulties that have arisen to a large extent due to the inadequate investment in informatics, both in terms of HR and infrastructure, and also with regard to developing existing and new systems. The system was also very much exposed to the poor digital literacy of users, including the most basic use of computer and telecommunications equipment, as well as computer and information literacy and the use of software systems themselves.

The digital culture in healthcare institutions needs to be raised, along with the digital competence of all employees. Digital culture is also important for the close cohesion of informatics and other areas of work in organisations, eliminating the traditional divergence. Here, the digital competence of all employees is very important.

In short, major efforts will be needed, as well as funds, to maintain and continue the truly huge progress made in healthcare informatics in recent years.

References

Arcury, T. A., Sandberg, J. C., Melius, K. P., Quandt, S. A., Leng, X., Latulipe, C., Miller, D. P., Jr, Smith, D. A., & Bertoni, A. G. (2020). Older Adult Internet Use and eHealth Literacy. Journal of applied gerontology : the official journal of the Southern Gerontological Society, 39(2), 141–150. https://doi.org/10.1177/0733464818807468

Bokolo A. J. (2021). Application of telemedicine and eHealth technology for clinical services in response to COVID 19 pandemic. Health and technology, 1–8. Advance online publication.

Doraiswamy, S., Abraham, A., Mamtani, R., & Cheema, S. (2020). Use of telehealth during the COVID-19 pandemic: scoping review. Journal of medical Internet research, 22(12), e24087.

European Commission. (2018). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on enabling the digital transformation of health and care in the Digital Single Market; empowering citizens and building a healthier society. SWD (2018) 126 final. Brussels.

European Commission. (2019). Digital Economy and Society Index (DESI); 2019 Country Report; Slovenia. https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=59912

European Parliament. (2021). Regulation (EU) 2021/953 of the European Parliament and of the Council of 14 June 2021 on a framework for the issuance, verification and acceptance of interoperable COVID-19 vaccination, test and recovery certificates (EU Digital COVID Certificate) to facilitate free movement during the COVID-19 pandemic; PE/25/2021/REV/1. https://eur-lex.europa.eu/eli/reg/2021/953/oj.

Glöggler, M., & Ammenwerth, E. (2021). Development and Validation of a Useful Taxonomy of Patient Portals Based on Characteristics of Patient Engagement. Methods of Information in Medicine, 60(S 01), e44-e55.

Guitton, M. J. (2021). Something good out of something bad: eHealth and telemedicine in the Post-COVID era. Computers in Human Behavior, 123, 106882.

Janet, J., & Stanimirović, D. (2020). Prenova portala zVEM. In T. Marčun & E. Dornik (Eds.), Digitalni mostovi v zdravstvu : e-Kongres MI'2020 : zbornik prispevkov in povzetkov : Ljubljana, 5. november 2020 (pp. 55–59). SDMI.

Kljajić Borštnar, M. (2021). Raziskovanje informacijskih sistemov : učbenik (p. 1 spletni vir (1 datoteka PDF (45))). Fakulteta za organizacijske vede.
https://estudij.um.si/pluginfile.php/676575/mod_resource/content/2/U%C4%8Dbenik%20razisk ovalna%20metodologija%20Kljaji%C4%87%20Bor%C5%A1tnar%20Mirjana%202021.pdf

Lee, S. M., & Lee, D. (2021). Opportunities and challenges for contactless healthcare services in the post-COVID-19 Era. Technological Forecasting and Social Change, 167, 120712.

Ministry of Health (2005). eZdravje2010 Strategija informatizacije slovenskega zdravstvenega sistema 2005-2010, Ministrstvo za zdravje.
https://joinup.ec.europa.eu/sites/default/files/document/2014-12/e-Zdravje2010%20- %20Strategija%20informatizacije%20slovenskega%20zdravstvenega%20sistema%202005- 2010.pdf

Ministry of Public Administration (2019). EVALVACIJA UKREPOV IZ ENOTNE ZBIRKE UKREPOV, Vrednotenje učinkov implementacije projekta eZdravje: eRecept, eNaročanje,
https://www.stopbirokraciji.gov.si/novice/razbremenitve-z-uvedbo-elektronskih-resitev-erecept-in- enarocanje-1

Ministry of Health (2021a). Pravilnik o pooblastilih za obdelavo podatkov v Centralnem registru podatkov o pacientih (Uradni list RS, št. 51/16 in 95/21)

Ministry of Health (2021b). Odlok o načinu ugotavljanja izpolnjevanja pogojev prebolevnosti, cepljenosti in testiranja v zvezi z nalezljivo boleznijo COVID-19 (2021). (Uradni list RS, št. 126/21).

Mohajan, H. K. (2018). Qualitative research methodology in social sciences and related subjects. Journal of Economic Development, Environment and People, 7(1), 23-48.

National Institute of Public Health (2021a). Rešitve eZdravja. https://www.ezdrav.si/

National Institute of Public Health (2021b). Portal zVEM. https://zvem.ezdrav.si/

National Institute of Public Health (2021d). EU digitalno COVID potrdilo. https://www.ezdrav.si/storitve/digitalno-covid-potrdilo-eu/

Petrova, I., Balyka, O., & Kachan, H. (2020). Digital economy, and digital employment appearence. Social and labour relations: theory and practice, 10(2), 10-20.

Rant, Ž., Stanimirović, D., Tepej Jočić, L., Žlender, A., Gaspari, I., Božič, D., Indihar, S., Beštek, M., Simeunovič, B., Vrečko, A., Matetić, V., & Zidarn, J. (2018). Rešitve e-Zdravja. In I. Eržen (Ed.), 30 let Slovenskega društva za medicinsko informatiko : [publikacija ob 30-letnici Slovenskega društva za medicinsko informatiko] (pp. 184–190). Slovensko društvo za medicinsko informatiko.

Rant, Ž., Stanimirović, D., & Žlender, A. (2019). Nacionalni Portal zVEM v okviru eZdravja = National portal zVEM within eHealth. In P. Šprajc, I. Podbregar, D. Maletič, & M. Radovanović (Eds.), Ekosistem organizacij v dobi digitalizacije [Elektronski vir] : konferenčni zbornik = [Ecosystem of organizations in the digital age : conference proceedings (pp. 873–884). Univerzitetna založba Univerze.

Sim, J, Waterfield, J. (2019). Focus group methodology: some ethical challenges. Quality & Quantity. 2019 Jul;53(6):3003-3022.

Stanimirović, D., & Matetić, V. (2020). Can the COVID-19 pandemic boost the global adoption and usage of eHealth solutions? Journal of Global Health [Elektronski Vir], 10(2), 1–5.

Stanimirović, D. (2021). eHealth Patient Portal - becoming an indispensable public health tool in the time of COVID-19. In J. Mantas (Ed.), Public Health and Informatics : the future of co-created eHealth : 31st Medical Informatics in Europe Conference (MIE 2021), online 29-31 May 2021 (Issue 281, pp. 880–884). IOS Press.

Sust, P. P., Solans, O., Fajardo, J. C., Peralta, M. M., Rodenas, P., Gabaldà, J., ... & Piera-Jimenez, J. (2020). Turning the crisis into an opportunity: digital health strategies deployed during the COVID-19 outbreak. JMIR public health and surveillance, 6(2), e19106.

Tulu, B., Trapp, A. C., Strong, D. M., Johnson, S. A., Hoque, M., Trudel, J., & Garber, L. (2016). An analysis of patient portal utilization: what can we learn about online patient behavior by examining portal click data?. Health Systems, 5(1), 66-79.

Turer, R. W., DesRoches, C. M., Salmi, L., Helmer, T., & Rosenbloom, S. T. (2021). Patient Perceptions of Receiving COVID-19 Test Results via an Online Patient Portal: An Open Results Survey. Applied Clinical Informatics, 12(04), 954-959.

Yin, R. K. (2018). Case study research and applications : design and methods (6th ed.). Sage.van Gemert-Pijnen, J. E., Nijland, N., van Limburg, M., Ossebaard, H. C., Kelders, S. M., Eysenbach, G., & Seydel, E. R. (2011). A holistic framework to improve the uptake and impact of eHealth technologies. Journal of medical Internet research, 13(4), e111.

van Gemert-Pijnen, J. E., Nijland, N., van Limburg, M., Ossebaard, H. C., Kelders, S. M., Eysenbach, G., & Seydel, E. R. (2011). A holistic framework to improve the uptake and impact of eHealth technologies. Journal of medical Internet research, 13(4), e111.

ZZPPZ. (2021). Zakon o zbirkah podatkov s področja zdravstvenega varstva (Uradni list RS, št. 65/00, 47/15, 31/18, 152/20 – ZZUOOP, 175/20 – ZIUOPDVE, 203/20 – ZIUPOPDVE in 112/21 – ZNUPZ).