The Role of the Service Desk for eHealth Solutions in the Digital Transformation of Slovenian Healthcare

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The Service Desk carries out three basic tasks: general support for all users of the eHealth system, support in connecting to the secure healthcare network (zNET), and making electronic appointments for medical services. This article analyses the operation of the Service Desk through time dynamics, the content of requests dealt with and services provided during the COVID-19 pandemic. The article is based on the case study research methodology. The data showed accelerated growth in the use of the Service Desk, with a more than seven-fold increase recorded in 2021 relative to 2020. The biggest proportion of the Service Desk requests in 2021 related to the zVEM Patient Portal and zNET. The Service Desk is one of the most important mechanisms for the successful development and use of the eHealth system in Slovenia, and the pandemic only made this even more evident and distinct.

Keywords:
eHealth, user help, eHealth Service Desk, digital transformation of healthcare

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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 numerous challenges facing Slovenia's healthcare sector. Experiences in developed countries indicate (Bokolo, 2021; Arcury et al., 2020) that successfully implemented projects for healthcare digitalisation have exceptional strategic importance for further development of the healthcare system and considerable implications for increased social well-being and economic growth (European Commission, 2018). The project of Slovenian healthcare digitalisation (eZdravje or eHealth), which follows the national and European guidelines, was one of the key long-term goals of the public sector in Slovenia. The management of the digital solutions that were created as part of the eHealth project was taken over in 2015 by the National Institute of Public Health (NIJZ). Up until then, the eHealth project was managed by the Ministry of Health, and a large proportion of the start-up funds was provided from the European Social Fund.

An exhaustive review of the field indicates that the difficulties encountered right from the outset in the eHealth project stem on the one hand from the technological characteristics of the existing and rather fragmented healthcare information systems (HIS), 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 existing state of affairs can be attributed principally to the decision-making entities that left the development of health informatics in this period up to individual or institutional initiatives, needs and interests, without unified strategic guidelines. Moreover, decision-makers in this period have not been able to effectively promote the eHealth initiative or ensure stronger political (financial, HR, organisational) support through the formulation of a modern and consistent strategy in this area.

The consequences of these factors are reflected in specific challenges identified by the NIJZ in its activities for the successful implementation and management of the eHealth system:

- the unpreparedness (administrative, technological, organisational, procedural, and so forth) of certain healthcare providers for appropriate use of the eHealth solutions;

- procedural, organisational, security, and user problems at healthcare providers;
- the lack of professional consensus regarding the substantive issues (e.g. the healthcare service code (VZS), authorizations for accessing the Central Registry of Patient Data (CRPD));
- the narrow focus of individual stakeholders on their own professional field without being aware of the interdependency of all stakeholders in the healthcare ecosystem;
- a lack of competent IT experts at healthcare providers who could ensure adequate maintenance and operation of the eHealth system;
- inadequate funds for digitalisation projects at healthcare providers and the NIJZ, which works to ensure the development and maintenance of central national eHealth system components.

Despite these challenges, the lack of unified strategic documents and inadequate investment in the area, great progress has been made in the development and implementation of eHealth solutions in the past four years. The national importance of some eHealth solutions was widely acknowledged, such as the zVEM Patient Portal, which received the two biggest IT prizes in Slovenia: the prize for current achievements in the information society for 2022, and the 2022 "eReward" for the zVEM mobile application. The zVEM+ portal is a version of the zVEM portal and is only intended for use by healthcare professionals.

As expected, and as it actually turned out during the management of the eHealth system, a large number of users often need help or advice for various reasons. Accordingly, a special organisational unit called the Service Desk was established and is managed by an external provider. The Service Desk is intended for all eHealth system users who wish to report disruptions in operation, who need assistance or require information regarding the functioning of the eHealth system. In the meantime, the Service Desk has proven to be one of the most important components of eHealth, as it has directly or indirectly helped thousands of users and significantly contributed to the successful development of eHealth solutions, their implementation and increasing use. In line with the points set out above, this article focuses on the research question of how the COVID-19 pandemic impacted the functionality and use of the Service Desk. Accordingly, the article analyses the

operation of the eHealth Service Desk during the COVID-19 pandemic through the dynamic and content of requests dealt with and services provided.

2 Methods

The article presents an analysis of the functionality and use of the eHealth Service Desk during the COVID-19 pandemic. Our research sought to answer the question of how the COVID-19 pandemic impacted the development and use of the Service Desk. During the pandemic, new circumstances appeared that required rapid adaptation, so the Service Desk underwent an accelerated evolution. This is an example of the digital service that experienced fast-track expansion process during COVID-19, which indicates that in this respect the pandemic was a special opportunity for development. Our research was based on the case study research methodology (Yin, 2018; Kljajić, 2021), which included an in-depth analysis of the field and its critical review. We used statistics from the administrative and business intelligence modules in the analysis to compare the number of events, calls received and time taken in minutes in 2020 and 2021. We also compared data on the support provided for various eHealth solutions.

The analysis was conducted on the one hand based on a review of the literature in this field (Lee, 2022), as well as on the examination of project documentation and the technical specifications for the Service Desk. On the other hand the study was carried out on the basis of observations, experiences and the expert opinion of professionals at the NIJZ who are in charge of the eHealth system and the Service Desk. In addition we used the actual statistical data to support the findings obtained (NIJZ, 2021). The selection of research methods 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 experience in this field. This methodological approach enabled not just an insight into the current theoretical and technological basis for these kinds of digital solution, but also an empirical overview of the use of the Service Desk in the Slovenian healthcare system. The participation of experts from the NIJZ in the research provided an insight into the technological and statistical aspects of the operation, and also enabled a critical and thorough insight into the user aspects of the Service Desk, since the participating experts from the NIJZ are very familiar with the user experiences of patients and health workers in

the field, and with their satisfaction with the eHealth solutions. The analysis of the functionality and use of the Service Desk was conducted in the first half of 2023. Structured interviews with the NIJZ experts and the acquisition of statistical data from business and administrator modules were carried out between January and April 2023.

The article focuses on the Service Desk principally due to its importance both for patients and healthcare workers. The synthesis of findings from the literature, user functionalities, statistical reports and the views of experts from the NIJZ enables us to formulate credible conclusions based on verifiable data regarding the highlighted research aims (Lindgren et al., 2020). The use of the above-defined methodological framework, including a combination of various approaches and techniques for data gathering, was vitally important for the credibility of the analysis (Sim & Waterfield, 2019). The comprehensive analysis of data obtained from a diverse array of sources and from interviews with experts from the NIJZ ensured an appropriate platform for interpreting the data and formulating consistent conclusions regarding the research objectives (Thomas, 2021), which address the functionality and use of the eHealth Service Desk.

3 Results

The Service Desk for eHealth users was considered in the very first strategic documents relating to eHealth. Since the transfer of eHealth to the NIJZ at the end of 2015, its role has become increasingly significant. This was especially evident during the COVID-19 pandemic, when the usual methods of training users and dealing with requests were not possible, and the development and usage of the eHealth solutions took a major leap forward.

The Service Desk provides assistance for nearly 30 eHealth features and has three basic tasks:

- general support for all users of the eHealth system;
- support in connecting to the zNET;
- making electronic appointments for medical services.

General support for all users of the eHealth system is intended for patients, healthcare workers, administrative staff, IT specialists, software providers and all other users of the eHealth system who wish to report disruptions in operation, who need help or require information relating to the functioning of the eHealth system. Support in connecting to the zNET offers assistance to healthcare providers who wish to connect to the national eHealth infrastructure and become a part of the secure healthcare network. The eAppointments system for medical services helps patients to make appointments electronically. Users can access help by means of the online form at the web page, via email messages or by telephone for all eHealth features, for assistance with eAppointments, and for connection to the zNET. The website also provides answers to frequently asked questions.

During the COVID-19 pandemic the Service Desk responsibilities were expanded to provide support for a range of new eHealth solutions. New solutions for healthcare providers concerned assistance in screening tests for COVID-19, entering test results for COVID-19 in zVEM+, the zVEM+ feature for COVID-19 entry points and support for patient information. The zVEM+ portal enables the capture of data, its processing, and the issuing of various reports that healthcare providers must send out. It is intended for providers, which do not use their own information system for this kind of operation (Rant, Stanimirović & Janet, 2022a; Rant, Stanimirović & Janet, 2022b). New eHealth solutions for patients included the EU Digital COVID certificate (EU DCP) and registration for vaccination against COVID-19. In addition to these features, special support was provided to patients in making eAppointments, since the operation of the entire healthcare system was extremely restricted.

Support is provided by a permanent, experienced team of advisers specialised in various fields and features of eHealth. The advisers undergo constant training – both general and for specific features – and attend lectures, trainings and workshops. Videos are available for review and training of new co-workers. The Service Desk has built a massive knowledge base, keeping documentation and working to provide answers to frequently asked questions. The Service Desk website publishes notices related to the operation of the eHealth system and promptly publishes information about detected malfunctions and problems on the national level.

In the course of this research we used the statistical data from the administrative and business intelligence modules and compared the number of events, calls received and time taken in minutes in 2020 and 2021 by the Service Desk. Data reveals that the number of Service Desk requests grew considerably during the COVID-19 pandemic (Figure 1).

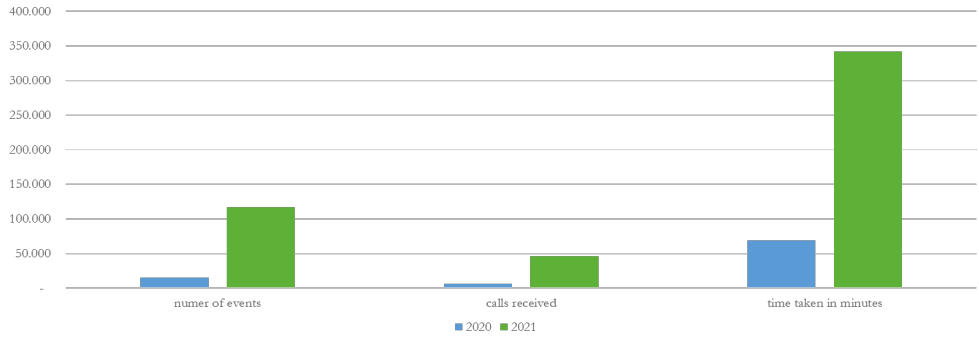

Figure 1: Ratio of Service Desk requests in 2020 and 2021

Additionally we compared the number of Service Desk requests in 2021 concerning the different eHealth solutions (Table 1).

Table 1: Percentage of Service Desk requests for different eHealth solutions in 2021

eHealth solution	**Percentage of requests %**
zVEM Patient Portal	69.06
ePrescription	0.32
eAppointment	4.80
CRPD	5.08
Vaccination registry	1.27
zNET	12.50
Security scheme	1.06
Application for preventive treatment	0.15
Teleradiology	0.12
Telestroke	0.05
eTriage	0.07
Other information	5.49

The biggest proportion of the Service Desk requests in 2021 related to the zVEM Patient Portal (Figure 2).

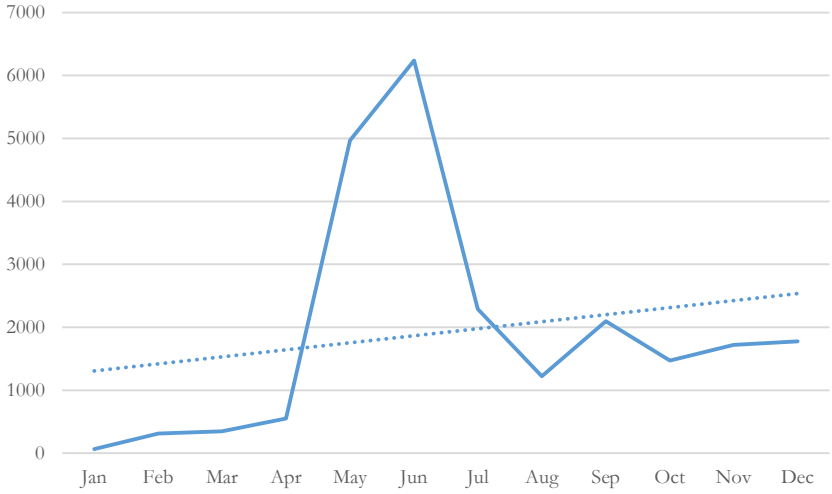

Figure 2: Number of Service Desk requests related to the zVEM Patient Portal in 2021

The data also show that the Service Desk requests for help with eAppointments followed the epidemiological situation, as the numbers grew the most in May 2021, after the first wave of the COVID-19 pandemic (Figure 3).

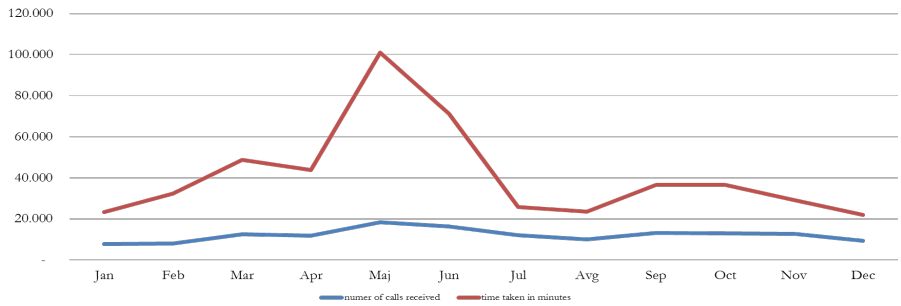

Figure 3: Service Desk requests for help with eAppointments

Since January 2021, the number of calls for eAppointments has been increasing, with a significant jump in May of that year, as a result of the introduction of the new digital solution for vaccination against COVID-19, which citizens mistakenly

expected from the eHealth Service Desk. The increased volume of immaterial and irrelevant calls, which continued in June, was causing problems and preventing the Service Desk from reaching those patients who really needed help with eAppointments. In an attempt to free up the phone lines, we removed the eAppointment phone number from the entry page of the zVEM Patient Portal, as it was seen by many as the entry point for booking vaccinations. We also added congestion alerts to the website and additional instructions for patients looking for answers to other questions.

A significant increase in the number of calls to the Service Desk was detected after the introduction of eHealth solutions designed to monitor rapid tests for COVID-19, the introduction of vaccinations against COVID-19 and the issuance of EU digital COVID certificates. The existing team in the Service Desk was burdened more than usual, which affected the resolution of other eHealth requests.

The provider of the Service Desk points out a really large number of requests for connecting to the zNET, with which they are burdened on a daily basis. The rush to join was especially intense in April, because it was decided that from May 2021 eHealth solutions can only be accessed through the zNET. It was pointed out that it is necessary to provide the contact information of IT specialists for many new users of the zNET.

It is also evident that a greater proportion of requests are resolved at the Service Desk. However, due to the heavy load on the agents, there are occasional errors such as request redirection and missing data. In order to reduce the workload and stress of the Service Desk agents, we redesigned the informational website and supplemented it with updated contents. To connect to the zNET, a special phone number and email address were introduced. We analysed the increased volume of requests related to COVID-19 and prepared strategies to improve response times in resolving requests. A workshop for resolving requests related to IT issues and the zNET was held in April. Discussions are still taking place regarding Service Desk agents' access to the zVEM+ portal for user support purposes.

4 Discussion

The research findings showed that the COVID-19 pandemic had a profound and extensive impact on the functionality and use of the Service Desk. The COVID-19 pandemic showed how important the digitalisation of healthcare is (Stanimirović & Matetić, 2020), and in particular how the existence of a national infrastructure and central systems is vital for digitalisation. This was the case in developing the eHealth solutions in Slovenia. The COVID-19 pandemic circumstances and the inaccessibility of health services has accelerated the use of digital solutions, including eHealth solutions. This demanded the upgrades of numerous eHealth solutions, which needed to be developed and implemented in the shortest time possible. Some digitalisation objectives were achieved through existing solutions with some adaptations, while certain solutions needed to be reworked, and some needed to be developed completely from scratch.

In the 2020-2021 period two solutions in particular made great progress – the zVEM Patient Portal and the CRPD (Rant et al., 2022a). On the zVEM Patient Portal the number of registered users grew nine-fold (925%) in 2021 relative to 2020, and the number of visits grew 12 times (1,273%). The number of documents in the CRPD grew eight-fold in 2021 relative to 2019 (849%) (Rant et al., 2022b).

The rapid development of digital solutions and the exceptionally short time for implementation, which did not allow for the usual training of users and dealing with requests, generated unexpected pressure at the Service Desk. To a large extent, the pressure came from the users' and general public's lack of information and high expectations of eHealth solutions created by the media and politics, as well as the general public. Data on the number of requests received by the Service Desk reveal the exceptional growth in activity in the last two years. The number of events in 2021 grew more than seven times (766%), as did the number of calls received (742%), and the time taken in minutes grew five-fold (493%) (Figure 1). The highest growth is visible in May and June 2021 (Figure 2), which is also related to the acquisition of the EU Digital COVID certificates via the zVEM Patient Portal and the introduction of vaccinations and testing at healthcare providers. In May 2021 for instance, 80% to 90% of requests related to the zVEM Patient Portal or to questions regarding the EU DCP (Figure 2). This proportion declined later on.

One of the reasons for such demand for assistance with the zVEM Patient Portal is certainly help from the Service Desk agents in obtaining the EU DCP, which was required by the strict rules on movement in Slovenia during the COVID-19 pandemic. A significant advantage is that on the part of the agents, a real human answered the calls and not an automated system. The agents could adapt to users, their knowledge, experience and level of digital literacy. In this way, users obtained assistance firstly in accessing the zVEM Patient Portal, and following this, the agents would walk users step by step to finally obtaining the EU DCP. User satisfaction can be seen in the numerous expressions of gratitude they offered.

In providing support, the agents encountered many challenges and difficulties. Without a doubt, the greatest difficulty was the unpredictability of the daily and monthly workload, for which it was hard to prepare. There was a major increase in the number of calls and requests during the COVID-19 pandemic, and the Service Desk workload increased radically with the introduction of new features (e.g. the zVEM Patient Portal and the COVID certificate).

Users needed help with a variety of digital solutions, including eAppointments for vaccination, aAppointments for examinations, obtaining referrals and prescriptions, access to results and discharge letters. All this was available to them on the zVEM Patient Portal, for which it was mandatory to obtain a qualified digital certificate, and later the SI-PASS. The Service Desk agents led users through what are at times the truly complex and time-consuming procedures of registration for various online services.

One of the difficulties encountered by the Service Desk is the large number of calls that are not related to the eHealth systems, but are principally related to the COVID-19 pandemic. Such calls cause a notable burden at the Service Desk and the unavailability of the phone lines, which in turn causes dissatisfaction among those users who really need help and who must frequently wait longer for assistance. During the pandemic the Service Desk received general questions about health, questions about COVID-19 treatment and medications, and about vaccinations, vaccines and side effects. Moreover, patients contacted the Service Desk with questions about the measures in place and restrictions on movement. All these questions, requests and claims undermined the activities and main purpose of the Service Desk, which is to support users of the eHealth system, and not to provide

the public with answers to general questions about COVID-19 and related epidemiological measures.

4 Conclusion

Since the completion of the project in 2015 the national eHealth system in Slovenia has undergone unimagined development. The whole national eHealth architecture underwent particularly accelerated development during the COVID-19 pandemic. In this period of such extensive development of new eHealth solutions and rapid growth in use (more than ten-fold), the Service Desk played a key role. Its proficient and unstinting assistance to users, be it citizens or health professionals, facilitated the effective use of the new and already existing eHealth solutions. The latter findings revealed the important role of the Service Desk in the field of healthcare digitalisation, especially in crisis situations and when introducing new digital solutions. On the other hand, the huge increase in requests received by the Service Desk during this period revealed that eHealth solutions were not well promoted and that a large number of citizens and health professionals do not have the skills to use digital solutions. These findings obligate managers of the national eHealth system to invest more in eHealth infrastructure, especially in such important components as the Service Desk. At the same time, the findings imply that the efforts and resources allocated to the promotion of eHealth solutions, education and training of citizens and professionals so far, have been decidedly insufficient and that the results of these activities have not yielded the desired results. It seems that the COVID-19 pandemic has done more to raise awareness and usage of eHealth solutions in a very short period of time than any other initiative before, be it of a political, legislative, administrative or financial character. Given this alarming fact, there should be a thorough examination and discussion of what activities are needed to address the exposed issues, otherwise we might largely undermine all efforts and achievements so far and significantly compromise the further development of healthcare digitalisation projects.

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