Reorganization of Information Technology Service Development Processes in the Healthcare Sector

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ABSTRACT

With globalization and technological advances, organizations in the healthcare sector must consider the new opportunities provided by technology and redesign the processes for developing new information technology services. According to the existing legal framework in Lithuania governing the development program for improving the quality and efficiency of healthcare services, organizations in the healthcare sector must consider the new requirements and needs arising from technological advancement. Therefore, following the analysis of the information technology service development processes in healthcare organizations, it was found that there is a need to expand the catalog of information services within healthcare organizations and to create a new spectrum of information technology services. Thus, the aim of this study is to provide suggestions on how to restructure the processes of setting up new information technology services in healthcare sector organizations. The following research methods were used to achieve the objectives of the study: analysis of scientific literature, expert evaluation, and in-depth interviews. The findings of the study indicated that to significantly improve the activities of healthcare sector organizations, it is important to analyze the internal processes of the organization, which would help to restructure them purposefully, supplement them with new processes, or abandon outdated ones. A thorough expert survey revealed the necessary changes related to the processes of developing new information technology services within healthcare sector organizations.

Keywords: reorganization, information technology, processes reorganization, healthcare sector.

1. Introduction

According to the 2022–2030 development program managed by the Ministry of Health of the Republic of Lithuania, related to the improvement of healthcare quality and accessibility, organizations in the healthcare sector must consider the aspects of implementing the service for developing and deploying a unified healthcare management and cost accounting information system.

An analysis of the processes for developing and implementing healthcare information technology services revealed a need to enhance the information technology development services of healthcare organizations and to offer a new range of information technology service development. When creating information technology services, it is important to follow the identified, un-updated IT service development process map. Therefore, to renew the process of creating new information technology services, it is essential to restructure this process by considering expert evaluations appropriately.

The problem of this study is that the process map for information technology services in some healthcare sector organizations does not align with correspond to the names of the actors involved in the process and the distribution of functions. However, it should be noted that restructuring processes enhance the performance of organizations (Ozcelik, 2010; Forliano et al., 2020; Fetais et al., 2022/04; Pasaribu et al., 2021; Sincora et al., 2023). Therefore, this change in the information technology services process is necessary to meet the current demands of healthcare sector organizations and operate at optimal speed

(Dursun et al., 2022). Thus, the object of this study is the process of creating new information technology services in healthcare sector organizations.

The aim of this research is to provide suggestions on how to restructure the process of developing information technology services in healthcare sector organizations. The objectives of the study would be to examine the tasks of organizational process restructuring (Fasna et al., 2019), investigate the current need for the restructuring of the new information technology service development process in healthcare sector organizations through expert evaluation, and propose a restructured map of the new information technology service development process for healthcare sector organizations. Various research methods were applied in the study, including analysis of scientific literature, expert evaluation, and in-depth interviews.

2. Peculiarities of the Process Reorganization

The internal processes of an organization are defined as a set of logically related tasks performed to achieve a desired outcome (Davenport et al., 2003; Global Standards, 2023). These may include various activities such as communication among employees, decision-making, planning and executing work tasks, as well as other processes taking place within the organization. These processes are crucial for the organization's operations and efficiency.

In scientific literature, process reengineering is commonly defined as a rethinking and radical redesign of processes (Fetais et al., 2022/07), helping to eliminate tasks that do not enhance performance or create added value (Tucci, 2023; Wang et al., 2024). It is an interdisciplinary challenge that encourages a broader perspective on processes involving strategies, metrics, risks, data, and business architecture (Beerepoot et al., 2023).

Process reengineering significantly improves organizational performance (Forliano et al., 2020; Fetais et al., 2022/04; Sincora et al., 2023). When examining process reengineering (Vera et al., 2022), it is important to consider the human aspect and reduce employee resistance to change (Marjanovic, 2000; Fetais et al., 2022/04), as well as consider the organizational culture of public sector institutions (Schmiedel et al., 2020).

Process reengineering is the review, analysis, and rethinking of an organization's business processes to improve efficiency and flexibility. In a contemporary organization characterized by dynamic changes, it is crucial to clearly understand internal processes to facilitate their targeted reengineering, introducing new ones, or eliminating outdated processes. A 5-step method is applied for targeted process reengineering to change workflows (Figure 1) radically (Davenport et al., 1990; Tucci, 2023): create a business vision and process objectives; identify the processes that need to be redesigned; comprehension and assessment of the existing processes; use of information technology as an opportunity for change; design and make prototype a new process.

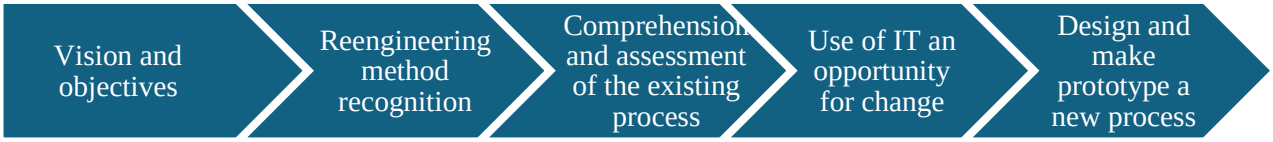

Figure 1: Five-Step Method (compiled according to Davenport et al., 1990; Tucci, 2023)

3. Analysis of the Process Reorganization in the Healthcare Sector

Methods such as expert evaluation and in-depth interviews were chosen for the research. Expert evaluation is the process whereby qualified specialists or experts analyze and assess specific information, products, or services based on their knowledge and experience in a particular field. Considering this, high-quality and professional evaluation results can be expected (Macijauskienė et al., 2023).

One of the most critical stages of any research is data collection, which can be divided into three types of data collection methods: observation, interviews, and document collection. An interview is a structured conversation or discussion between two or more individuals, typically conducted to gather information. Individual in-depth interviews aim to obtain detailed information that is significant to the research (Rupšienė, 2007; Rutledge et al., 2020). The primary advantages of in-depth interviews include detailed information obtained, direct contact with the respondent, the ability to thoroughly explore issues, and the emergence of new insights. The main disadvantages include the need for researcher experience, the bias toward the research question, and the time-consuming nature of conducting interviews.

To evaluate the process change, an expert assessment of its key participants was conducted using the in-depth interview method. The study involved 11 experts with a master's degree, at least 10 years of experience in the field of information technology, and a minimum of 5 years of experience working in healthcare sector organizations.

The experts working in the healthcare sector were asked ten questions (Lucidchart, 2024/11; Proctor, J., 2024):

- Is the current information technology development process in healthcare sector organizations efficient?
- What is the primary goal of the information technology development process in healthcare sector organizations?
- Is there a need to redesign the IT development process in health sector organizations?
- Will we begin changing the information technology development process in healthcare sector organizations as soon as possible?
- Will you personally contribute to the reengineering of the information technology development process in healthcare sector organizations?
- Who should be the owner of this information technology development process in healthcare sector organizations?
- Who should participate in the information technology development process in healthcare sector organizations, i.e., be a participant in the process?
- Who should be the sponsor (at the management level (Musonda et al., 2022) of this information technology development process in healthcare sector organizations?
- Is the information technology development process in healthcare sector organizations suitable for developing the organizational culture?
- Will you mention the success of the changes implemented in the information technology development process in healthcare sector organizations?

By examining the internal documents and process descriptions of the information technology development process in healthcare sector organizations and conducting in-depth interviews, potentially problematic parts of the information technology service development process, participant roles, and process stages were analyzed. Based on the experts' evaluation results, the information technology service development process was reengineered.

4. Research Results

After analyzing the internal documents of healthcare sector organizations and reviewing the current process maps of these organizations, a process was identified that possibly does not meet the needs of healthcare

sector organizations — the process of developing new information technology services within the organization (Figure 2).

A comprehensive expert evaluation was conducted using the in-depth interview method, involving 11 information technology experts working in the healthcare sector. Their summarized opinions are presented in the evaluation tables of the restructured process (Tables 1 and 2).

Table 1. Expert evaluation of the restructured process: from the first to the fifth question (compiled by the author)

Evaluative aspects	**Results of the expert evaluation**
Process efficiency evaluation	90.9% of the experts who participated in the interviews stated that the current information technology service development process is inefficient (taking 2-3 working days), and only 9.1% of experts described the current process as partially effective.
Process goal	All experts identified that the main goals of this process are to quickly and efficiently create a new service and to manage the service development process.
The necessity of process reengineering	All experts stated that the change is necessary. The experts pointed out several reasons that they believe are the most important: the age of the process (established in 2016) and the mismatch of participants' roles with the current organizational structure.
The possibility of starting the reengineering in 2024	In this regard, the opinions of the experts were divided. 54.5% of experts stated that due to the high workload of the organization's employees, it would not be possible to restructure the process and start using it in 2024. However, 45.5% of experts stated that the process could be restructured and put into use in 2024.
Personal contribution	90.9% of experts stated that they would undoubtedly contribute to the process reengineering, and only 9.1% of experts indicated that they might contribute to the change ("If my position is needed").

All experts unanimously agreed that the information technology service development process is inefficient and needs to be restructured. In their insights, the experts emphasized what should be restructured regarding the participants in the information technology service development process and what actions they should take.

The experts indicated who should be the new owner of the information technology service development process. The results of the expert evaluation showed that the majority of expert opinions were consistent across all questions.

Table 2. Expert evaluation of the restructured process: from the fifth to the tenth question (compiled by the author)

Evaluative aspects	**Results of the expert evaluation**
Process owner	All experts stated that it is recommended that the process owner should be the Information System Service Manager of the Information Systems Maintenance Unit's User Service Desk.
Process participants	All experts identified the process owner, the project manager who is responsible for the development of the new information system, and the director, who will need to sign the order for the updated service catalog, appoint the system administrator, and designate a responsible employee from the operations department. 72.7% of experts stated that it is necessary to include a data protection advisor and an information security officer in the list of process participants, as it is essential to assess the compliance of the new service with data protection and cybersecurity regulations (27.3% of experts did not mention these process participants).
Process sponsor (at the management level)	All experts indicated that the director of the Information Technology Department supports all information technology changes initiated by the employees of this department.
Organizational culture	All experts stated that the organizational culture is suitable; however, despite this, all inefficient and outdated processes should be restructured.
Mention the success aspects of the process of reengineering	72.7% of experts stated that the reengineering of the process could be mentioned, even though such traditions do not exist in the organization. According to 27.3% of experts, there is no necessity to mention the process within the team.

However, one question related to the timeline for implementing the information technology service development process revealed differing opinions among the experts. More experts (6 out of 11) stated that the changes in the organization would not be implemented by the end of 2024, while others (5 out of 11) indicated that it would be successfully accomplished in the upcoming year. This was the only question where the experts' opinions varied significantly.

5. Recommendations for the Process Reorganization in the Healthcare Sector

Based on the results of scientific studies and the responses obtained from expert evaluation (in-depth interviews) in healthcare sector organizations, as well as the experts' recommendations regarding the information technology development process in healthcare sector organizations, two restructuring alternatives were proposed.

The first restructuring alternative would involve modifying the current process to fit new job positions. The second alternative would entail radically restructuring the process, considering the actions performed by the organization's employees, their sequence, and the assignment of roles to the process participants.

The second alternative, which aligns with the needs of healthcare sector organizations, was selected, and a proposed roadmap for the reengineering of the new information technology service development process was presented (Figure 2).

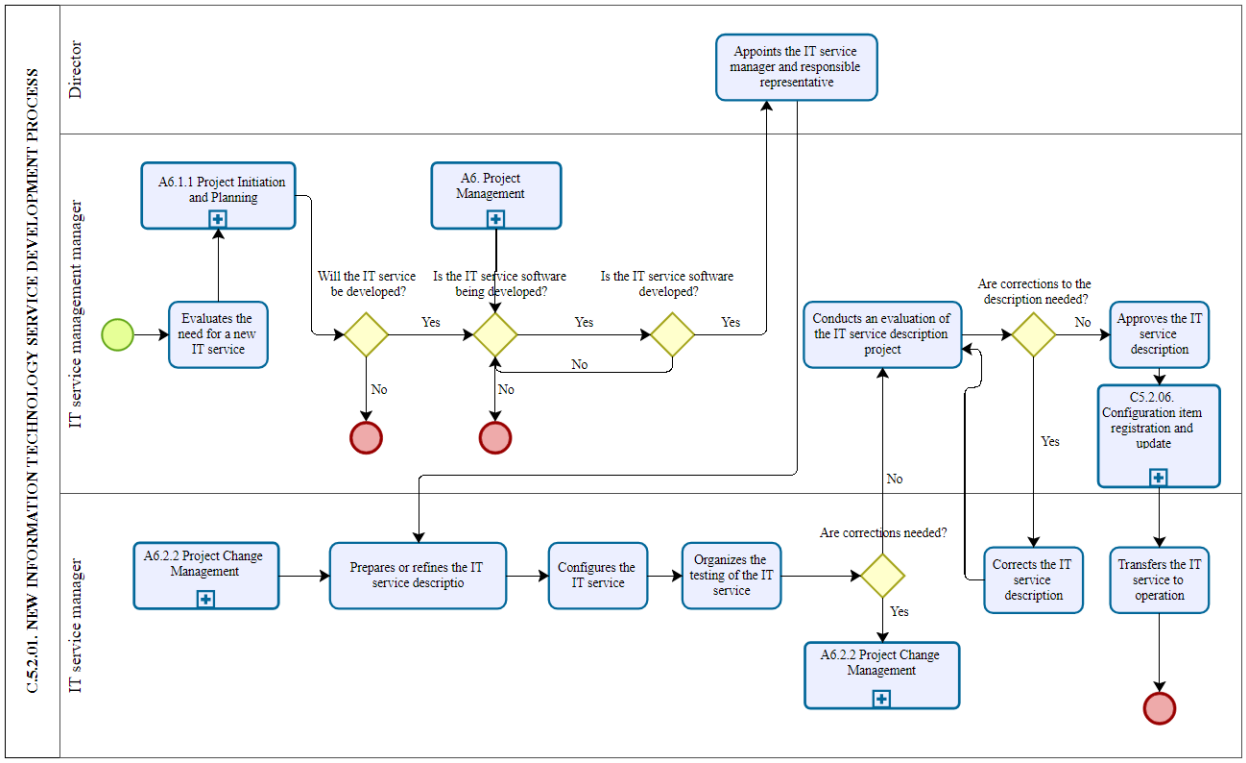

Figure 2. New information technology service development process in healthcare sector organizations (compiled by the author based on internal documents of healthcare organizations).

Experts identified five main participants in the process: the service manager of the information technology development process in healthcare sector organizations, referred to by experts as the process owner; the IT project manager; the data protection officer; the head of the Information Systems Development Department; and the director.

This roadmap will enable the organization to plan and execute the development process of new information technology services more efficiently, helping to understand better (Ito et al., 2021) how this process works and how the different participants need to collaborate to achieve a successful outcome (Figure 3). Flowchart with swimlanes helps teams see how processes are constrained (Lucidchart, 2024/08).

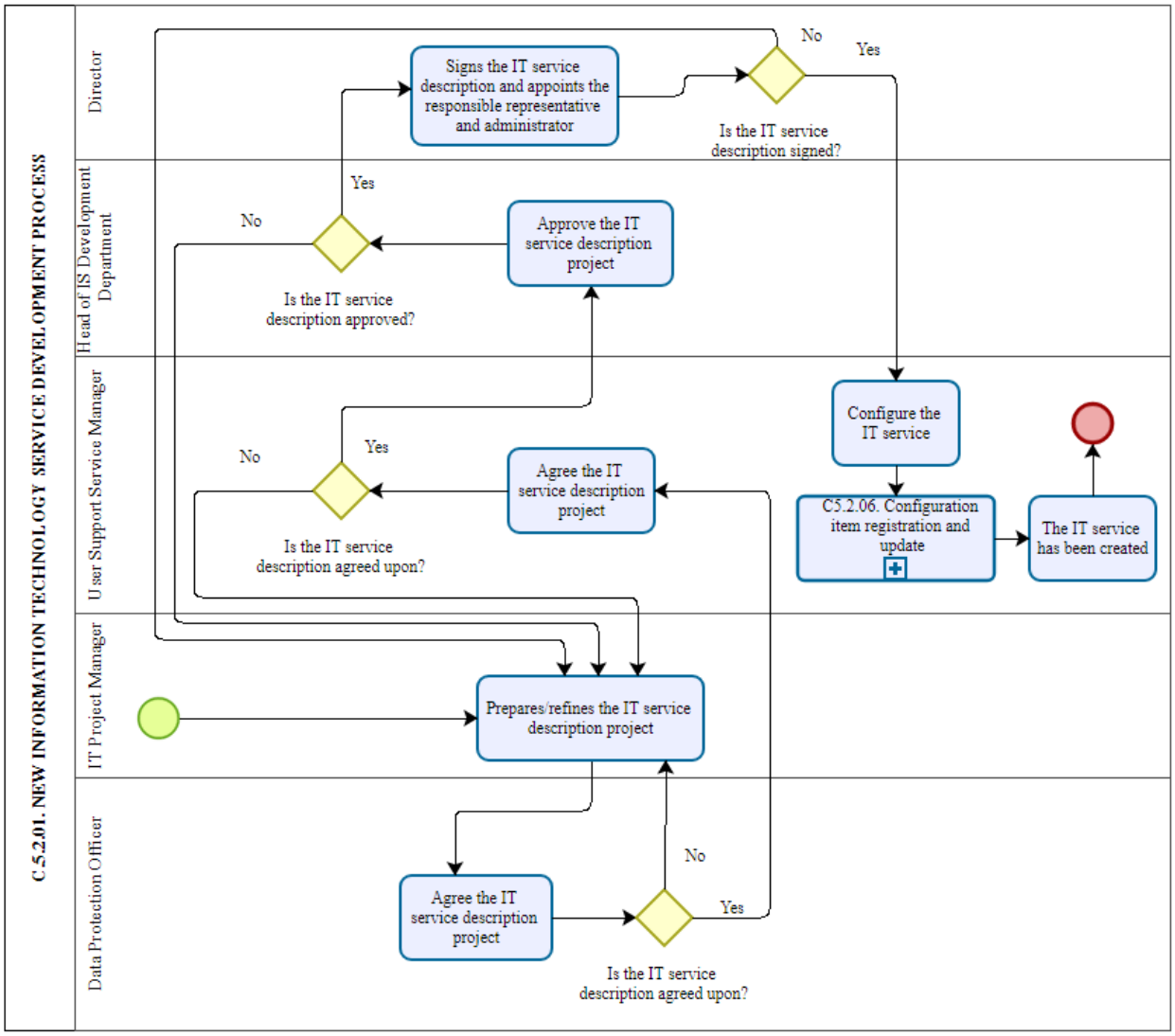

Figure 3. Reengineering of the new information technology service development process in healthcare sector organizations (compiled by the author)

6. Conclusions

After analyzing the process reengineering tasks of healthcare sector organizations, it was determined that to significantly improve the performance of healthcare sector organizations, it is essential to analyze their internal processes. This analysis would help to purposefully reengineer, supplement with new processes, or eliminate outdated ones.

A comprehensive evaluation of experts working in healthcare sector organizations established the need to restructure the new information technology service development process, which does not meet the needs of healthcare sector organizations. It is proposed that healthcare sector organizations initiate changes to this process and adapt it to the current structure of healthcare sector organizations.

A proposed roadmap for the reengineering of the new information technology service development process is intended for healthcare sector organizations. Based on expert evaluations, it is anticipated that by restructuring this process, the creation of new information technology services in healthcare sector organizations will be quicker (1-2 working days instead of 2-3 working days) and of higher quality (monitored by three specialists instead of 1 specialist), taking into account the actions performed by

organizational employees, their sequence, and the distribution of functions among the participants in this process.

The main limitation of this study is that it was conducted solely using examples from healthcare sector organizations. Therefore, further research could be related to organizations in other sectors, their information technology service development processes, and their reengineering.

References

Beerepoot, I., et al (2023). The biggest business process management problems to solve before we die. *Computers in Industry* 146. https://doi.org/10.1016/j.compind.2022.103837

Centrinė viešųjų pirkimų informacinė sistema (2024). Retrieved from <https://pirkimai.eviesiejipirkimai.lt/app/rfq/edittransaction.asp?TID=718465>

Davenport, T. H. & Short, J. E. (1990). The new industrial engineering: Information technology and business process redesign. <https://dspace.mit.edu/bitstream/handle/1721.1/48613/newindustrialeng00dave.pdf>

Davenport, T. H. & Short, J. E. (2003). The new industrial engineering: Information technology and business process redesign. *Operations Management: Critical Perspectives on Business and Managemen*t, 97-123.

Dursun, M., Fındık, S.S. and Goker, N. (2022). Business process reengineering in healthcare sector: application for the central sterilization unit. *Kybernetes*, 51(2): 715-744. https://doi.org/10.1108/K-11-2020-0777

Fasna, M.F.F. and Gunatilake, S. (2019). A process for successfully implementing BPR projects. *International Journal of Productivity and Performance Management*, 68(6): 1102-1119. https://doi.org/10.1108/IJPPM-09-2018-0331

Fetais, A., Abdella, G. M., Al-Khalifa, K. N. & Hamouda, A. M. (2022/04). Business Process Reengineering: A Literature Review-Based Analysis of Implementation Measures. *Information*, 13(4), 185. https://doi.org/10.3390/info13040185

Fetais, A., Abdella, G. M., Al-Khalifa, K. N. & Hamouda, A. M. (2022/07). Modeling the Relationship between Business Process Reengineering and Organizational Culture. *Applied System Innovation*, 5(4), 66. https://doi.org/10.3390/asi5040066

Forliano, C., De Bernardi, P., Bertello, A. & Temperini, V. (2020). Innovating business processes in public administrations: towards a systemic approach. *Business Process Management Journal*, 26(5), 1203–1224. https://doi.org/10.1108/BPMJ-12-2019-0498

Global standards (2023). How to determine the processes in your organization? Retrieved from: <https://www.globalstd.com/en/blog/how-to-determine-the-processes-in-your-organization-blog/>

Ito, S., Vymětal, D. and Šperka, R. (2021). Process mining approach to formal business process modelling and verification: a case study. *Journal of Modelling in Management*, 16(2): 602-622. https://doi.org/10.1108/JM2-03-2020-0077

Lucidchart (2024/08). 3 diagrams to make your processes more visual. Retrieved from: < https://www.lucidchart.com/blog/3-diagrams-to-make-your-processes-more-visual>

Lucidchart (2024/11). 40 questions to ask when creating new processes. Retrieved from: < https://www.lucidchart.com/blog/40-questions-to-ask-when-creating-new-processes>

Macijauskienė, E. & Jesevičiūtė-Ufartienė, L. (2023). Viešojo sektoriaus darbuotojų įsitraukimo į organizacijų veiklas skatinamųjų veiksnių vertinimas. Iš 26-osios Lietuvos jaunųjų mokslininkų konferencijos „Mokslas – Lietuvos ateitis" teminė konferencija. *Ekonomika ir Vadyba* (175-185). Vilnius.

Marjanovic, O. (2000). Supporting the soft side of business process reengineering. *Business Process Management Journal*, 6(1), 43-55. https://doi.org/10.1108/14637150010313339

Musonda, I. and Okoro, C.S. (2022). A hermeneutic research on project management approaches applied in a business process reengineering project. *Business Process Management Journal*, 28(8): 66-89. https://doi.org/10.1108/BPMJ-11-2021-0694

Ozcelik, Y. (2010). Do business process reengineering projects payoff? Evidence from the United States. *International Journal of Project Management*, 28(1), 7-13. https://doi.org/10.1016/j.ijproman.2009.03.004

Pasaribu, R.D., Anggadwita, G., Hendayani, R., Kotjoprayudi, R.B. and Apiani, D.I.N. (2021).Implementation of business process reengineering (BPR): case study of official trip procedures in higher education institutions. *Journal of Industrial Engineering and Management*, 14(3): 622-644, https://doi.org/10.3926/jiem.3403.

Proctor, J. (2024). The Five Essential Business Analysis Questions for BPR. Retrieved from: < https://www.inteqgroup.com/blog/business-analyst-best-practices-the-five-essential-business-analysis-questions>

Rupšienė, L. (2007). Kokybinių tyrimų duomenų rinkimo metodologija. Retrieved from: <https://www.researchgate.net/publication/323497804_Kokybiniu_tyrimu_duomenu_rinkimo_metodologija>

Rutledge, P.B. & Hogg, J.L.C. (2020). In-Depth Interviews. In The International Encyclopedia of Media Psychology, J. Bulck (Ed.). https://doi.org/10.1002/9781119011071.iemp0019

Schmiedel, T; Recker, J. & vom Brocke, J (2020). The relation between BPM culture, BPM methods, and process performance: Evidence from quantitative field studies. *Information & Management* 57 (2). https://doi.org/10.1016/j.im.2019.103175

Sincora, L.A., Oliveira, M.P.V.d., Zanquetto-Filho, H. & Alvarenga, M.Z. (2023). Developing organizational resilience from business process management maturity. *Innovation & Management Review*, Vol. 20 No. 2, pp. 147-161. https://doi.org/10.1108/INMR-11-2021-0219

Teisės aktų registras (2023). Retrieved from: <https://www.e-tar.lt/portal/lt/legalAct/20692ae053a011ee81b8b446907f594f>

Tucci, L. (2023). Business process reengineering. Techtarget. Retrieved from: <https://www.techtarget.com/searchcio/definition/business-process-reengineering>

Vera, A. and Zapata, C.M. (2022). Best practices of business process improvement: towards a representation on top of the Quintessence kernel. *Business Process Management Journal*, 28(3): 876-903, https://doi.org/10.1108/bpmj-10-2021-0687

Wang, C.N., Vo, T.T.B.C., Hsu, H.P., Chung, Y.C., Nguyen, N.T. and Nhieu, N.L. (2024). Improving processing efficiency through workflow process reengineering, simulation and value stream mapping: a case study of business process reengineering. *Business Process Management Journal*, 30(7): 2482-2515. https://doi.org/10.1108/BPMJ-11-2023-0869