

## AN ANALYSIS OF THE PERSONAL AND PROFESSIONAL EXPERIENCES OF THE EMPLOYEES OF A SOFTWARE DEVELOPMENT COMPANY REGARDING THE DIGITIZATION OF PUBLIC SERVICES

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**Abstract:** *This research explores the impact of digitization on employees in a software development company, focusing on their personal and professional experiences. The study aims to identify their perspectives on digitising public services and offers suggestions for improvement. Qualitative research, including a focus group, was used to gather insights. The results highlight the advantages and challenges of digitizing public services. Positive aspects include fast online payments and improved administrative efficiency. However, technical issues and communication problems pose challenges. To enhance digitization, the study recommends investing in infrastructure, cybersecurity, and digital education. Additionally, fostering partnerships and implementing agile approaches can drive continuous innovation and improvement. The findings contribute to understanding successful digital public service development and offer insights for future research on technology adoption within public institutions.*

**Keywords:** *digitalization, public services, digital public services, software developers' perspective, personal and professional experiences*

### INTRODUCTION

Rapid technological advancement has changed how we engage with the world around us and, more crucially, how public services are provided and used in recent decades. One of the fundamental pillars of contemporary

civilization is the digitization of public services, which guarantees increased effectiveness, openness, and accessibility [1].

The mix represented by the technological development that is taking place quite quickly, and the political decision-makers aiming towards digitalization, highlight the need for researchers to analyze how digitalization influences the interaction between citizens and public authorities in the context of the provision of public services, so as to support initiatives in this sector [2]. Thus, it is important to understand the technology and digital solutions existing on the market to be able to make future contributions in the fields.

Recent papers in this field analyze aspects such as the impact of the digitization of public services on citizens (aiming at information related to user satisfaction [3] [4], the degree of accessibility and ease of use of digital services [5], as well as the level of trust in the security of personal data[6] [7]), administrative efficiency (reducing bureaucracy [8], decreasing costs [9]), technology integration (interoperability between digital and traditional systems [10], ensuring cyber security [11]), implementation and challenges learned from various projects [11] [12], as well as case studies and international comparisons (presentation of specific projects of digitization of public services from different countries or regions, results and lessons learned). However, there is a poorly developed area in terms of the creation of scientific articles that present the experience that developers of digital solutions have in terms of public services. Those who are experts in the technological field and have a deep understanding of the digital solutions used for the digitization of public services are the software developers. Through their professional experience, they can provide a comprehensive perspective on how to implement and integrate technologies to improve public services [13].

Thus, this research aims to make a significant contribution to the understanding of the impact of the digitization of public services on the employees of a software development company. To capture the holistic perspective of digital transformation, the focus is on the personal and professional experiences of these employees who work for a company that creates customized software solutions. This company offers everything that means system administration, mobile payment integration, information systems audit, but also consultancy. Thus, the two particular goals that this study aimed to achieve are:

- O1 - Identification of the personal and professional experiences of the employees of the analyzed company regarding the digitalization of public services;
- O2 - Determining some suggestions for improving the digitalization of public services.

The focus group technique will be used as part of the study's qualitative research methodology. Even though the goal of this study is to examine how the digitization of public services has affected the personal and professional lives of employees of a software development company, the results obtained can be used as a starting point for ongoing process improvement and the creation of a more positive and productive work environment for both employees and customers and end users of digitized public services.

## EXPERIMENTAL

The main objective of this research is to analyze the personal and professional experiences of a software development company's employees in terms of interaction with digitized public services. In order to achieve this objective, qualitative research was carried out, while the technique used is the "focus-group" type. Through this technique, representative data can be quickly collected from a relatively small number of participants, but with experience in a specific field [14] [15], their points of view being analyzed in depth [16]. In order to organize the focus group, 2 guides and methodologies were consulted [17] [18]. For this analysis, a software developer company with experience in the digitalization of public services was chosen, where one of the authors carried out an internship of 10 hours per month, for approximately 1 year. The company had 5 employees, of which only 4 had experience in digitization projects of public services. Thus, only the 4 employees with experience in the digitalization of public services were invited to participate in the organized focus group. Apart from the 4 participants, 2 other people participated in the meeting (the moderator and the other employee who took care of recording the answers).

In this focus-group meeting, there were discussed several aspects regarding the digitalization of public services, but in this paper, only one aspect will be presented. Thus, in order to achieve the main objective, two specific objectives were set, for which a series of questions were formulated (Table 1).

*Table 1. Objectives and questions used in the focus group research*

| <b>Objectives</b>                                                                                                                                                      | <b>Questions</b>                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| O <sub>1</sub> - Identification of the personal and professional experiences of the employees of the analyzed company regarding the digitalization of public services; | <ul style="list-style-type: none"> <li>➤ What have been your personal interactions with digitized public services? What do you think about these?</li> <li>➤ How do you think the digitization of public services has influenced your work and software development projects?</li> </ul> |
| O <sub>2</sub> - Determining some suggestions for improving the digitalization of public services.                                                                     | <ul style="list-style-type: none"> <li>➤ What improvements or innovations do you think could be made in the area of software development for digital public services?</li> </ul>                                                                                                         |

|  |                                                                                              |
|--|----------------------------------------------------------------------------------------------|
|  | ➤ How can you contribute to improving the company's digitization process of public services? |
|--|----------------------------------------------------------------------------------------------|

The focus group was organized right at the headquarters of the company where the participants from this research are employed. All 6 people involved in this research participated in an open discussion in the meeting room of the company, the participants sitting at a round table, to encourage a free discussion.

## RESULTS

Regarding the answers to the first question: *What have been your personal interactions with digitized public services?*, the participants covered both positive and negative aspects related to the digitization of the public sector, the answers referring to both their personal and professional experiences (Table 2).

*Table 2. Positive and negative aspects reported by focus group participants in relation to their personal experience with digitized public services*

| Positive aspects                                                                                                                                                                                                                                                                                                                                                                                 | Negative aspects                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• fast online payments</li> <li>• the convenience of making transactions from the workplace or personal home</li> <li>• lower costs with the transfer of documents</li> <li>• information related to various topics available online at any time</li> <li>• exemption from physical travel</li> <li>• access to databases and online resources</li> </ul> | <ul style="list-style-type: none"> <li>• technical problems with the website or with payment on the website</li> <li>• site is difficult to navigate</li> <li>• limited functionalities</li> <li>• delayed or incomplete responses from the institution</li> <li>• poor communication and support</li> <li>• unfriendly and unintuitive application interface</li> <li>• lack of necessary instructions for carrying out online processes</li> </ul> |

Regarding their personal experience with the digitization of public services, all 4 participants in the focus group mentioned the fact that they paid taxes online through the dedicated portal. They highlighted the speed and simplicity of the process, but also the convenience of making these transactions from the workplace or personal home, without having to stand in queues or fill out physical forms. Also, all 4 filled out forms and sent digital documents to various institutions, these actions being much faster and more efficient than sending them by mail or travelling personally to the institution's headquarters. One of the four participants mentioned that they used the online portals to apply for a driver's license renewal and to schedule a passport appointment. Another participant presented the fact that he uses online assistance services to obtain information and answers to various questions related to certain public services, appreciating the fact that access to these resources can be achieved at any time.

Regarding the way in which the participants used the digitization of public services in their professional activity, they mentioned the fact that, in order to be able to implement the digital solutions they promised to certain public institutions, they participated in online meetings and conferences organized by public institutions, which saved them from physical travel. In addition, to more easily solve situations they faced at work, they accessed databases and online resources to search for legal or fiscal information, filled in online forms to obtain grants or project financing and used online services to submit complaints and notifications to public institutions. Thus, the participants appreciated the fact that they were able to avoid the trips to the institutions' headquarters and were able to submit the applications from the comfort of the headquarters of the company where they work.

However, the participants in the focus group also highlighted some negative aspects that they faced when using digitized public services. One of the 4 participants reported experiencing technical issues while trying to pay a traffic fine online, with the transaction not being completed successfully on the first attempt. Two of the other participants presented some disappointing experiences with an online registration system for public services. The website was difficult to navigate and appointments were limited or already booked. In addition, they mentioned that at some point they needed an online certificate that they requested, but received delayed or incomplete answers from the institution. They considered that the part of communication and support was deficient in the case of that digitized institution. The other participant in the focus group also mentioned that he encountered various difficulties in filling out some online forms. The interface of the application was not very suggestive and did not receive enough instructions to understand the process.

After these discussions, which highlighted the varied experiences that the employees had with the digitalization of public services, the moderator launched the second question for debate: *How do you think the digitization of public services has influenced your work and software development projects?* (Table 3).

Table 3. Positive and negative aspects reported by focus group participants in relation to how the digitalization of public services influenced their professional activity

| Positive aspects                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Negative aspects                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• generating an increased demand for the development of software solutions</li> <li>• the opportunity to work on diverse and interesting projects.</li> <li>• process automation</li> <li>• reducing the time and effort required for custom software development.</li> <li>• opportunities for innovation and continuous improvement of the solutions offered by the company</li> <li>• access to more resources and data</li> </ul> | <ul style="list-style-type: none"> <li>• difficulties in integrating software solutions with existing systems.</li> <li>• significant investments in updating infrastructure and security standards</li> <li>• challenges in software development due to frequent changes in the requirements and regulations of digital public services</li> </ul> |

One of the 4 participants highlighted the fact that the digitization of public services generated an increased demand for the development of software solutions so that employees had the opportunity to work on diverse and interesting projects. The digitization of public services has allowed them to automate processes and reduce the time and effort needed to develop custom software. This aspect was also supported by two other participants, who added that the digitization of public services opened new opportunities for innovation and continuous improvement of the solutions offered by the company. They had access to more resources and data, which helped them create more advanced and efficient software solutions.

However, the fourth participant also wanted to highlight some negative aspects of the digitization of public services. He stated that the projects carried out by the company were affected by the outdated infrastructure of public services, which generated difficulties in the integration of software solutions with existing systems. The digitization of public services required significant investment in updating infrastructure and security standards, which involved additional resources and time. Moreover, some public institutions did not have the resources or capacity to effectively implement the developed software solutions, which delayed the digitization process. All of them also specified the fact that sometimes, frequent changes in the requirements and regulations of digital public services created challenges for them in software development, so they had to be more flexible and quickly adjust the solutions originally thought for customers.

The next section of questions sought to collect suggestions regarding the improvement of the digitalization of public services. The first question concerned *the type of improvements or innovations that could be brought to the field of software development for digital public services* (Table 4).

Table 4. Focus group participants' perceptions regarding the types of improvements or innovations that could be brought to the field of software development for digital public services

| Types of improvements                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• better integration and interoperability between different systems and platforms</li> <li>• the use of emerging technologies</li> <li>• creation of collaborative digital platforms and ecosystems</li> <li>• introduction of feedback mechanisms</li> <li>• monitoring the performance of digital public services</li> </ul> |

One of the participants in the focus group stated that better integration and interoperability between the different systems and platforms used within digital public services would be necessary, in order to allow users to access and manage information in a simple and efficient way. He mentioned that the use of emerging technologies, such as artificial intelligence or blockchain, could be used to ensure data security and optimize processes within digital public services. Another participant pointed out that collaborative digital platforms and ecosystems could be created, where public institutions could cooperate and share data and resources, for the benefit of end users. Moreover, he added that the introduction of feedback mechanisms and monitoring of the performance of digital public services should be a priority for public institutions, in this way, problems can be identified more quickly, which could also be remedied in an efficient way.

In addition to this question, another question followed: *How can you contribute to improving the company's digitization process of public services?* (Table 5).

*Table 5. Focus group participants' opinions regarding the type of contribution they could make in order to improve the digitalization process of public services*

| <b>Types of contributions</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• offering innovative software solutions adapted to the specifics of public services</li> <li>• collaboration with public institutions</li> <li>• collecting and analyzing user feedback and relevant data</li> <li>• implementing continuous improvements in the solutions offered by the company</li> <li>• promoting digital education</li> <li>• providing adequate training and technical support</li> </ul> |

One of the participants stated that both their company and the other software development companies can contribute to improving the digitization process of public services by offering innovative software solutions adapted to the specifics of public services, which provide a better final experience to users and simplify administrative processes. He mentioned that it is important to collaborate with public institutions to better understand their specific needs and challenges, to develop personalized and effective solutions. In addition, it is desirable to constantly collect and analyze user feedback and relevant data, in order to identify weak points and implement continuous improvements in the solutions offered by the company. These aspects were then completed by another participant, who added that in the future, it should also be taken into account the promotion of digital education and the provision of training and adequate technical support, to support public institutions in the adoption and effective use of digital services, to maximize their impact and benefits.

## **DISCUSSION**

The results obtained in this research highlight a series of relevant aspects for the successful development and implementation of digital public services in Romania. The digitization of public services brings both advantages and challenges, both for the employees of software development companies and for the end users and citizens who benefit from these services. The positive aspects, such as fast online payments, access to information at any time and improved efficiency of administrative processes, have contributed to better management of data and resources and a significant improvement in the quality of public services. On the other hand, negative aspects such as technical issues and lack of effective communication from institutions have created challenges in terms of integrating software solutions and adopting digital technologies. Thus, it is essential to overcome these challenges by investing in infrastructure and cyber security, as well as by promoting digital education and developing technological skills among citizens and public sector employees.

The results related to the second set of questions from this focus group emphasized the need for solid partnerships, common standards for interoperability, investments in human resources and the development of digital skills to improve the digitization of public services. Feedback from users and the implementation of agile approaches are also considered useful for continuous innovation and improvement.

The developers of digital public services could more easily identify technical challenges and their solutions, as they often face technical challenges during the digitalization process of public services [13], such as data security, application scalability or integration with existing systems. In addition, developers who have experience in developing solutions for digital public services can contribute to identifying the needs and expectations [19] of citizens regarding these services. Moreover, approaching the personal experience of developers can highlight both positive aspects and challenges from the perspective of professionals working in this field [20]. These personal stories can add a human touch and empathy to the discussion. Thus, including the perspective of software developers in an article about the digitization of public services can provide a more complete and detailed view of the process of digital transformation of public institutions.

## **CONCLUSIONS**

This paper emphasizes the importance of successfully implementing digital public services in Romania. These services offer benefits like convenient online payments and improved administrative efficiency, but challenges exist, such as technical issues and poor communication. To overcome these challenges, investment in infrastructure, cybersecurity, digital education, and technological skills is essential.

The results of this study, however, represent only a starting point for conducting future research aimed at determining the level of acceptance of digital public services. In this sense, as future directions, the analysis of

the specialized literature and the realization of a bibliometric study, the results of which will complement those found in this research, are pursued. Based on the conclusions drawn, a model will be proposed which will then be tested through quantitative research, to identify the main factors underlying the adoption of digital technologies within public institutions.

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