

DIGITALISATION OF PUBLIC ORGANISATIONS AS A TOOL FOR A RESPONSIVE REACTION TO A CRISIS SITUATION

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Purpose: This study aimed to determine the impact of digitalisation tools on the results of the work in public administration and the quality of the services provided.

Design/methodology/approach: A diagnostic survey method was used. 357 local government units were surveyed. Highly competent individuals with long years of work experience, in the public sector participated in the study. The findings are embedded in the field of public crisis management.

Findings: The research indicates that respondents generally hold a favorable perception regarding the influence of digitalisation tools and working methods on the quality of public services and the outcomes attained at work. Across all surveyed areas, opinions are divided between respondents who strongly highlight the positive role of digitalisation tools and those who acknowledge a positive impact, but have not firmly established their opinions.

Originality/value: The results of the research can be addressed to those involved in public crisis management, both local authorities and public bodies, as well as units responsible for practical actions in crisis situations.

Keywords: digitalisation, crisis management, crisis situations.

Category of the paper: research paper.

1. Introduction

Maintaining safety and order is one of the priority public services. According to the classification of contemporary public services, it belongs to the category of social services (Kozuch, Kozuch, 2011, p. 41). There is a regularity in management science that practice significantly precedes the emergence of scientific output. As Kozuch and Kozuch (2011, p. 32) point out, this lag is particularly large when it comes to public services, in Polish literature, this issue is almost unrecognised.

A state that respects its territory and citizens strives to maintain a high level of security (Maślanka, 2021). This is possible by preventing and mitigating threats. In view of this, one of the priority functions of a modern state is to guarantee its citizens basic conditions of protection against possible and real dangers related to the occurrence of natural disasters and other similar events caused by forces of nature, technical failures or armed actions. A properly organised society is prepared to function in a variety of situations, while it is the duty of public administration to have systemic solutions compatible with each situation, i.e. appropriate laws and forces and resources to enable effective crisis management (Sobolewski, 2021).

Ensuring the efficiency of operations at each stage of crisis management cycle (delivery time, quality and cost) requires crisis management actors to properly coordinate, integrate and effectively manage operations. Digitalisation tools are useful in this context. Digitalisation tools can be defined as programmes, websites, applications and other online and computerised resources that facilitate, improve and implement digital processes and general digitisation activities (Dash, 2022). Digitalisation of the public sector is a complex process and can be defined as the adaptation and increased use of digital or computer technologies (Pieriegud, 2016, p. 12). Digitalisation supports the responsiveness of the public sector. More broadly, a responsive public administration is one that is responsive to the diverse needs of the of the community for which it carries out its functions (Encyclopedia of Public Administration).

In order to respond quickly to hazards, governments have begun to implement early warning systems. In India, for example, early warning systems are in place so that those involved in rescue operations can monitor the information provided by the system and communicate with each other. Communication must take place at regular intervals in order to have access to the most up-to-date information on the onset and progress of a disaster (eGyanKosh, 2007).

It is also important to inform communities at risk immediately. The Federal Emergency Management Agency (FEMA), in collaboration with the Federal Communications Commission (FCC) and various wireless service providers in the United States, uses the Integrated Public Alert and Warning System (IPAWS) to disseminate warning messages (Bennett Gayle, 2019). The Wireless Emergency Alerts (WEA) system allows geo-targeted dissemination of messages to mobile phones in the area of direct threat (Federal Communications Commission). Such systems are also beginning to be implemented in Poland. Early Warning Systems (EWS) allow to warn residents of threats to life, health and property or about immediate evacuation and enable cooperation with police, municipal police, fire brigade, ambulance and other security services (Walek, 2013).

It is assumed that the digitalisation of the public administration is an important aspect in improving the functioning of local government. Therefore, the aim of this article is to determine the impact of digitalisation tools on the results of the work performed in public administration and the quality of the services provided. This objective will be achieved by seeking answers to the following research questions:

1. What is the impact of digitalisation tools on the results of work in local government units?
2. Do digitalisation tools improve the quality of public services?
3. Do digitalisation tools affect the level of inter-organisational cooperation?
4. Do public administration employees have the knowledge and skills to use digitalisation tools at work?

The answers to the research questions above are based on a study conducted in 2022 within local government units in Poland. The diagnostic survey method was used. The theoretical background and reference context of the conducted research is public crisis management. According to Krzeszowski (2023, p. 102), crisis management is listed as one of many scientific sub-disciplines of management and is systematically developing, gradually forming its own doctrine. Following the example of crisis management institutions organised in Europe, appropriate organisational and legal foundations have also been created in Poland, which protect the system of the state and citizens against crisis situations (Krzeszowski, 2023, p. 102).

2. Crisis situations - basic definitions

When acquainting oneself with the subject of crisis situations, it is valuable to highlight the distinctions between several terms that may seem similar but hold distinct meanings. Catastrophe (gr. *katastrophé*) is a term that has not always had a negative connotation, as it is one of the words that have found their way into the general language from literature - until the mid-19th century, 'catastrophe' in Polish functioned only as a theoretical and literary term (National Cultural Centre, 26.08.2023). The Cambridge Dictionary (26.08.2023), on the other hand, defines disaster as an event that causes very great trouble or destruction. There is no definition of disaster in Polish legislation, but a similar concept of natural disaster is explained as: "a natural disaster or technical failure, the consequences of which endanger the life or health of a large number of people, property on a large scale or the environment on a significant area, and the assistance and protection of which can be effectively provided only by means of extraordinary measures, in cooperation with various bodies and institutions and specialised services and formations acting under unified leadership" (Dz.U. 2002, nr 62, poz. 558).

Research by Roy (2010) shows that natural disasters lead to an increase in crime, especially property crime. However, some studies have found a decrease or stagnation in crime following natural disasters (Hombrados, 2019). For example, qualitative data collected one month after Hurricane Andrew in Florida shows that while the hurricane increased the number of criminals, it also increased the informal security force made up of civilians, leading to a sharp decrease in crime rates in the weeks following the hurricane (Hombrados, 2019).

Currently, the discussion on the climate crisis and related changes is intensifying. Empirical data and analyses eloquently demonstrate that anthropogenic climate change is real and that its consequences - such as coastal flooding or fires resulting from heat waves and droughts - threaten the livelihoods of people mainly in southern countries, but are also increasingly felt in northern countries (Krywult Albanski, 2018). Anthropogenic catastrophes, natural disasters and many other hazards result in human casualties, destruction of private and public property and environmental pollution. Marcinkowski (2019) defines a hazard as a potential situation characterised by randomness and intentionality, but with a negative impact on the level of safety.

Threats can lead to crisis situations. In order to better understand the definition of a crisis situation, it is first necessary to familiarise oneself with the word crisis (Gr. *krisis* - I make a distinction, I resolve) *sensu largo*, which means a turning point, a turning point that causes a change in the existing system (Wilińska, 2015). According to the Polish dictionary definition, a crisis is "a situation that is unfavourable for someone or something", mentioning housing, worldview and government crises. A crisis is 'a disruption that physically affects the system as a whole and threatens its basic assumptions and existential core' (Al.-Dahash, Thayaparan, Kulatunga, 2016). According to the Trans Adriatic Pipeline Organisation (2017), a crisis is any event that leads or may lead to an unstable and dangerous situation affecting individuals, groups, communities or whole countries, resulting in negative economic, political, social or environmental changes, especially when it occurs suddenly with little or no warning.

Some people understand the crisis in the same way as a crisis situation. Such an understanding is wrong. A crisis situation is a superior concept and its meaning is superior to a crisis. A crisis situation occurs both before and after a crisis. A crisis is a component of a crisis situation (Wilińska, 2015). According to Fajczak-Kowalska (2014), a crisis situation is a state of increasing destabilisation resulting in an intensive, permanent and long-term deterioration in the functioning of society and the state. It is characterised by the escalation of the threat, the loss of control to limit the impact of the event (crisis situation) by specific services, inspections or guards.

A crisis situation causes a lot of damage by limiting development and hampering the economic processes of the region in which it occurs. The residents experience enduring impacts from such events. A crisis situation is associated with uncertainty, inevitability, high dynamics and rapidity of events. When disaster strikes, time is of the essence. The first step is to send a team to assess the needs of the affected community, the extent of the damage and the resources required. Typically, this response should be very rapid, within 12 to 36 hours of a disaster (Agostinho, 2013). This involves mobilising resources, setting up an emergency response team and a logistics team. Next, it is necessary to ensure the delivery of: food, medicines, vaccines, tents, etc. These resources can come from pre-established stocks, local and international suppliers, as well as donations (Agostinho, 2013). Donations are even more challenging because they often involve large quantities of products that are shipped without any planning, causing bottlenecks at ports. In addition, there are times when donated resources do not match the actual needs of those affected (Agostinho, 2013).

3. Digitalisation of public administration

Digitalisation of public administration is a very broad term that covers a variety of issues (Drgas, 2019, p. 194): e-government, electronic government, electronic public services. E-government, as defined by Szyszka and Śliwczyński (2004), is an electronic information and communication relationship externally: office-citizen, office-entrepreneur, office-service provider, and internally: office-office, office-employee. Electronic government helps to "develop new relationships between public sector institutions, citizens and businesses through the use of information and communication technologies that enable the dissemination and collection of information and services within the public sector and for service delivery, decision-making and increased accountability" (Drgas, 2019, p. 195). The electronic public services are delivered in a partially or fully automated manner using information technology (Kapler, Piersiala, 2014). Examples of e-services are epuap.pl, sekap.pl, e-deklaracje.gov.pl.

When it comes to protecting citizens from threats, what is the right balance between keeping citizens safe and respecting privacy standards? Digital solutions must simultaneously keep citizens safe and respect their fundamental rights (Larsson, Teigland, 2020, p. 183). Researchers wonder what level of data encryption can be considered responsible, respecting citizens' legal rights to privacy while monitoring the activities of potentially dangerous actors. On the other hand, to what extent should citizens be privy to military plans, crises, operations and spending information (the prevalence of digital data leaks) (Larsson, Teigland, 2020, p. 183).

Despite doubts about the use of digitalisation tools, it is the way forward for both private and public organisations. Digitalisation leads to significant improvements: merging of data sources, optimisation of business processes, real-time processing (Bartkiewicz, Czerwonka, Pamuła, 2020). The management of modern organisations, including public sector organisations responding to crisis situations, requires complex decisions to be made in a short period of time. It is basically impossible to make them without integrated IT support and operational and analytical information resources (Bartkiewicz, Czerwonka, Pamuła, 2020). Digitalisation is implemented through the introduction of digitalisation tools.

Digitalisation tools make it possible to share information with citizens. In terms of citizen safety, this is for example RCB Alert. RCB Alert is an emergency alert system. The messages are distributed via short SMS messages. RCB Alerts are generated on the basis of information about potential threats received from ministries, services (e.g. police, fire brigade), central bodies and institutions (e.g. IMGW and provincial offices). The Government Security Centre, as the national crisis management centre, monitors the situation 24 hours a day, 7 days a week for the occurrence of various types of threats (gov.pl).

Digitalisation tools also improve the flow of information between agencies and institutions. This is crucial when responding to an emergency. The Supreme Audit Office report (NIK, 2017) describes the tempest that hit several provinces on the 11th and 12th of August 2017.

The Wielkopolska Crisis Management Centre did not have the IT tools to provide immediate notification of threats. The Gniezno County Crisis Management Centre of the Gniezno Starost did not use all means of transmitting messages to municipalities, which resulted in the city and commune of Gniezno not receiving a meteorological warning. Due to the lack of information about the impending threat, the municipal crisis management structures did not take any action to warn the population before the tempest hit. It should also be noted that the crisis management centres of the audited counties did not receive any information about the actual threat and its consequences from other crisis management centres through whose area the tempest had already passed, nor did they send such information themselves (Supreme Audit Office, 2017).

In its report, the Supreme Audit Office (2017) identifies a number of other problems in addition to the ineffective threat information system, including the disregard of crisis management plans, the lack of substantive qualifications of staff, the downplaying of recommendations and incomplete reports, and the lack of analyses and forecasts of the development of the situation. Therefore, on the initiative of the Minister of Interior and Administration, a draft law has been prepared to eliminate or reduce the identified problems in the field of civil protection in the broad sense, including crisis management. The main objective of the project is to create a legal act that comprehensively regulates the issue of civil protection; previously, such a task was assigned to the Crisis Management Act (Ministry of the Interior and Administration, 2023). The draft of the Ministry of the Interior and Administration identifies specific solutions to increase the safety of citizens by providing means, methods and resources to bodies providing direct and indirect assistance to the affected. Planned investments include the technical upgrade of the analogue civil alarm and notification system to digital (PLN 1,406,300,000) and the expansion, modernisation and integration of existing IT and communication systems (PLN 1,311,640,000).

Typically, emergency situations are characterised by a high degree of uncertainty, volatility and dynamics in the development of events, and the use of technology greatly improves emergency response (Frąckiewicz, 2023). Preparedness for emergency response includes establishing authorities and responsibilities for action and gathering adequate resources to support them: personnel (existing and/or additionally recruited), designating or purchasing facilities, equipment, and equipping with digitalisation tools.

4. Research methodology

The aim of the research is to determine the impact of digitalisation tools on the results of work in public administration and to embed these results in the field of public crisis management. The study started on 6.12.2022 and was completed on 21.12.2022. The study was carried out using the LimeSurvey software, in which the survey tool was entered. The sample

was created using data from the Public Information Bulletin, which contains a list of local government units in Poland. In order to ensure that the sample was representative and that all types of units were represented, stratified random sampling was used. The distinguishing feature of local self-government units (JSTs) was their membership of the NUST macro-region (Table 1).

Table 1.*List of NUST units in Poland*

Macroregions	%	n
MR Centralny	12.6%	45
MR Południowo-zachodni	13.2%	47
MR Południowy	13.7%	49
MR Północno-zachodni	16.8%	60
MR Północny	14.8%	53
MR Wschodni	16.5%	59
MR Województwa mazowieckiego	12.3%	44
total	100.0%	357

Source: gov.pl.

Each stratum had a structure corresponding to the differentiation of institutions according to their type (urban municipal office, urban-rural municipal office, rural municipal office) (Table 2).

Table 2.*Type of municipality*

Typ of municipality	%	n
urban municipal office	21%	76
rural municipal office	50%	177
urban-rural municipal office	29%	104
total	100%	357

Source: own elaboration.

To select units for the study, a non-repeating random number algorithm created in an Excel spreadsheet was used. The dataset of local government units was transferred to the CATI studio and totaled 1500 records. The response rate was around 25%, which means that approximately one in four or one in five questionnaire interviews was successful. In the end, 357 local government units were interviewed. The average completion time per questionnaire interview was 57 minutes. The distribution of units surveyed by province is shown below (Table 3).

Table 3.*Surveyed units by province*

Province	%	n
dolnośląskie	9.52%	34
kujawsko-pomorskie	5.60%	20
lubelskie	7.28%	26
lubuskie	3.08%	11
łódzkie	7.84%	28
małopolskie	7.28%	26
mazowieckie	12.32%	44

Cont. table 3.

opolskie	3.64%	13
podkarpackie	5.32%	19
podlaskie	3.92%	14
pomorskie	4.76%	17
śląskie	6.44%	23
świętokrzyskie	4.76%	17
warmińsko-mazurskie	4.48%	16
wielkopolskie	8.12%	29
zachodniopomorskie	5.60%	20
total	100.00%	357

Source: own elaboration.

The questionnaire was addressed to mayors, presidents and heads of municipalities. The respondent could also be a person designated by the above-mentioned persons as being competent for answering the questionnaire (Table 4).

Table 4.*Positions of respondents*

Current positions	%	n
Mayor	22%	79
President	0%	0
Mayor of a rural municipality	26%	93
Other	52%	185
total	100%	357

Source: own elaboration.

In the questionnaire's header, questions regarding the respondent's years of work experience, years of experience in the public sector, and the number of mandates in the current position were also included (tables 5-7).

Table 5.*Length of service of respondents*

Length of service in year	%	n
up to 5 years	24.09%	86
from 6 to 10	20.45%	73
from 11 to 15	12.89%	46
from 16 to 20	8.96%	32
from 21 to 25	8.40%	30
more than 26 years	25.21%	90
total	100.00%	357

Source: own elaboration.

Table 6.*Length of service in the public sector*

Length of service in the public sector	%	n
up to 5 years	3.36%	12
from 6 to 10	13.45%	48
from 11 to 15	14.29%	51
from 16 to 20	21.57%	77
from 21 to 25	16.81%	60
more than 26 years	30.53%	109
total	100.00%	357

Source: own elaboration.

Table 7.*Number of mandates in current position*

Number of mandates in current position	%	n
1	29%	103
2	27%	97
3	13%	48
4	10%	34
Other	21%	75
total	100%	357

Source: own elaboration.

5. Results

The questionnaire included the following statements:

1. The digitalisation of work has an impact on improving the results of your work.
2. The digitalisation of work has an impact on the quality of services provided by the public sector.
3. The digitalisation of work has an impact on improving working conditions in the public sector.
4. The implementation of digitalisation tools and methods has enhanced your ability to serve citizens, allowing you to better meet their needs.
5. The introduction of digitalisation tools and working methods has helped you to cooperate better with other public services/businesses and third sector organisations.
6. The implementation of digitalisation tools and working methods has enhanced performance monitoring within your organisation.
7. Utilizing digitalisation tools at work accelerates task completion for you.
8. You have had the opportunity to gain knowledge and skills in using digitalisation tools in your office.
9. You have the necessary resources (software and hardware) to use digitalisation tools.
10. The new skills required by digitalisation enrich your personal abilities.

The response scale was 5, with 5 being strongly agree and 1 being strongly disagree.

Figures 1-10 show the percentage breakdown of the survey results.

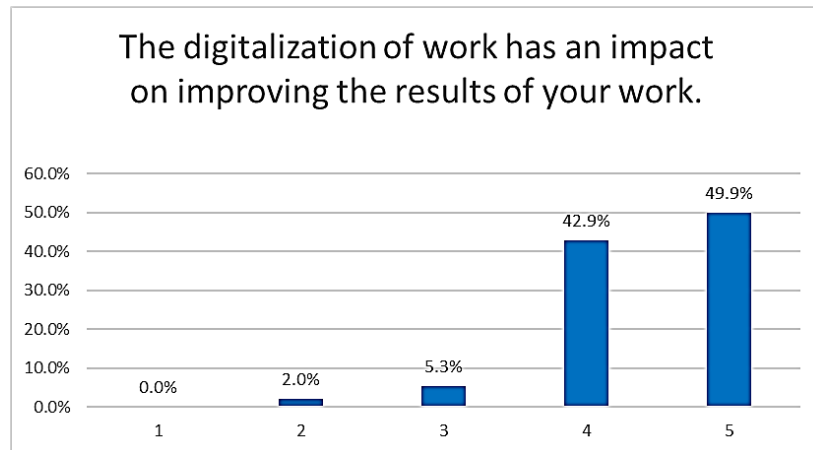


Figure 1. The impact of digitalisation on public sector work outcomes.

Respondents believe that digitalisation has had a positive impact on improving the results of their work. Half of respondents strongly agreed with this statement. The percentage of those who were uncertain about their opinion was also high at 42.9% ('rather yes'). One in twenty respondents had no opinion in this area and one in fifty felt that digitalisation was unlikely to have an impact on improving work performance (fig. 1).

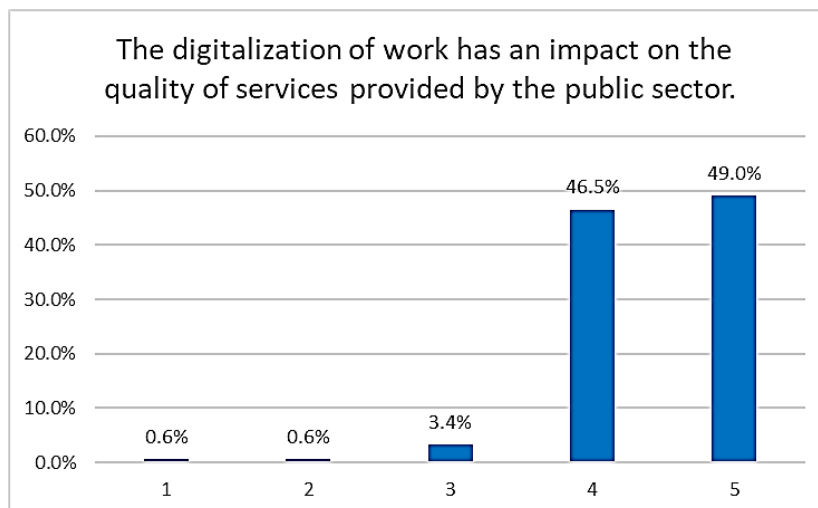


Figure 2. Impact of digitalisation on the quality of public service delivery.

The majority of respondents say that the digitalisation of work has an impact on the quality of public services. Almost half of the respondents expressed their opinion with conviction. A significant proportion of respondents (46.5%) agree with this statement, but express it with uncertainty. A small proportion of respondents (3.4%) have no opinion in this area (fig. 2).

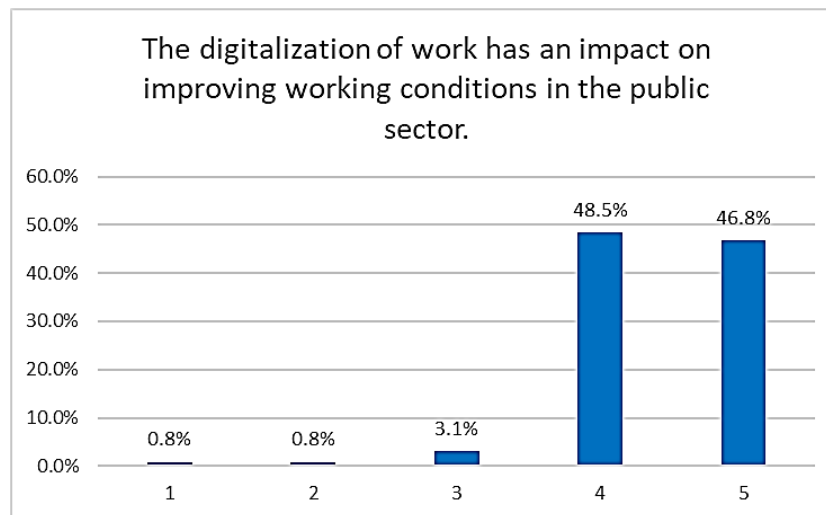


Figure 3. Impact of digitalisation on improving working conditions in the public sector.

It appears that the digitalisation of work improves working conditions in the public sector according to respondents. However, the majority of those who agree with this statement are unsure of their opinion. The difference between 'definitely yes' and 'rather yes' is small at 1.7%. Almost two per cent of respondents said that digitalisation had not improved working conditions (fig. 3).

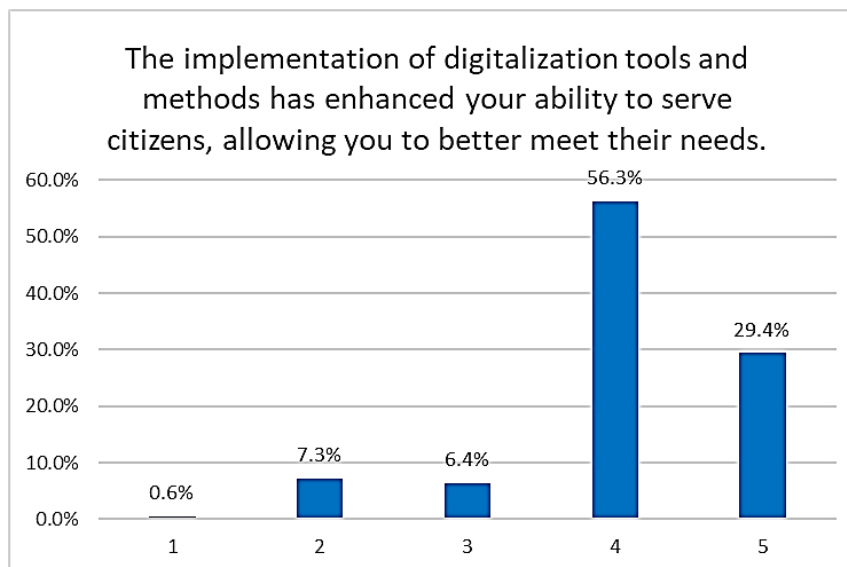


Figure 4. Impact of digitalisation tools and working methods in response to residents' needs.

The given statement that digitalisation makes it possible to better identify the needs of citizens was supported by 85.7% of respondents. The majority of these opinions are those that express uncertainty about the issue under study (56.3%). There is a percentage of 7.9% of respondents think that citizens' needs will be not better identified following the introduction of digitalisation tools and working methods (7.3% "rather not" and 0.6% "definitely not"). 6.4% of respondents have no opinion on this statement (fig. 4).

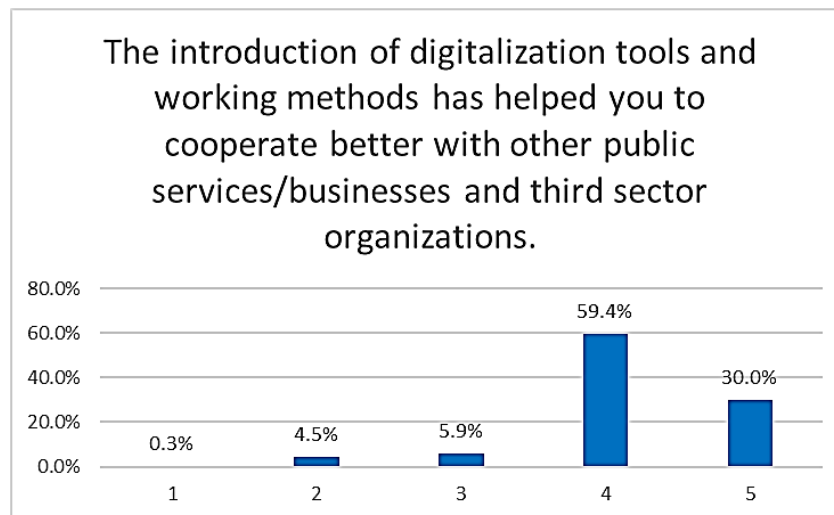


Figure 5. Impact of digitalisation tools and working methods on cooperation with other entities.

The data in Figure 5 show that respondents believe that digitalisation tools and working methods improve collaboration between organisations. However, among the positive opinions, most are expressed with uncertainty (59.4% 'rather yes' and 30% 'definitely yes'). There were also negative responses, with a total of 4.8%, as well as responses indicating a lack of opinion in the area surveyed (5.9% "I have no opinion").

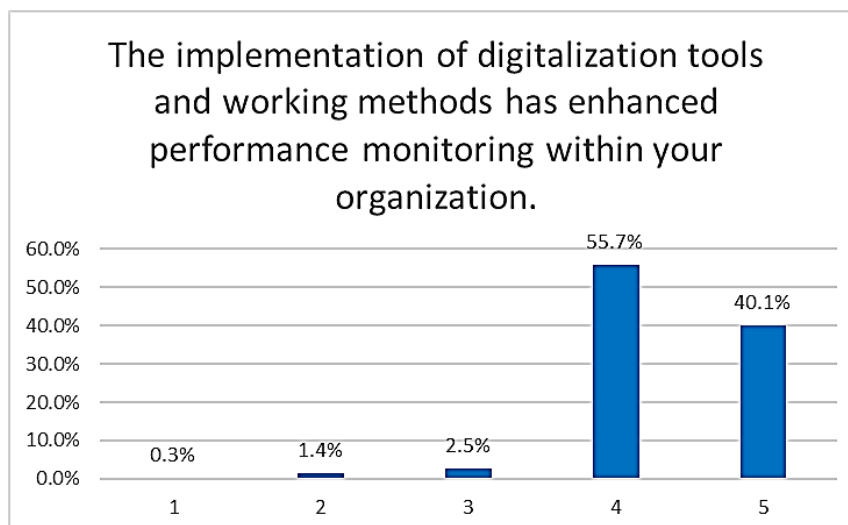


Figure 6. Impact of digitalisation tools and working methods on performance monitoring in the office.

It appears that digitalisation tools and working methods have increased the scope of performance monitoring in the public sector. The majority of respondents (55.7%) agreed with this statement with some uncertainty, while 40.1% strongly agreed that work monitoring had increased. A small percentage of respondents had not noticed any change in the level of monitoring following the introduction of digitalisation tools (fig. 6).

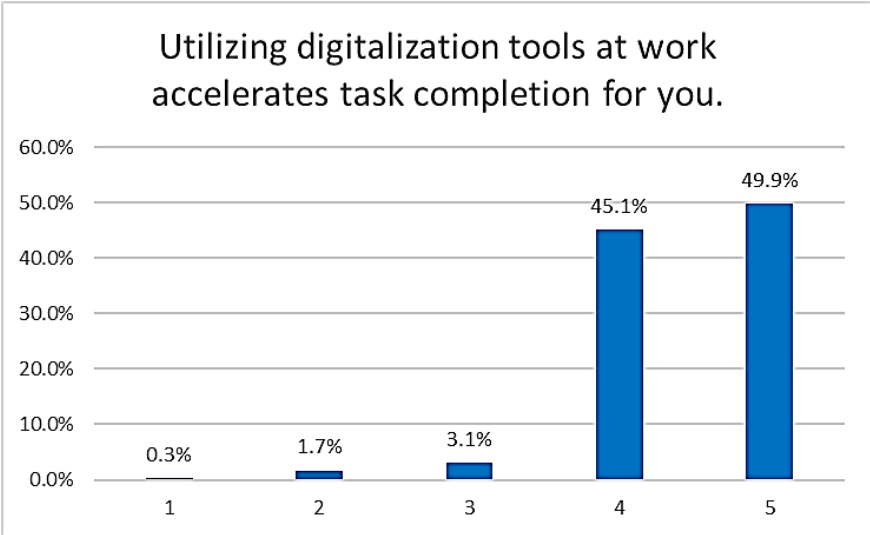


Figure 7. Impact of digitalisation tools on task completion times.

The majority of respondents (95%) agree that digitalisation tools make it possible to complete tasks faster. Half of respondents strongly agreed and 45.1% were uncertain. Two per cent of respondents did not see any impact of digitalisation on the speed of their tasks and 3.1% did not know how to respond to the statement (fig. 7).

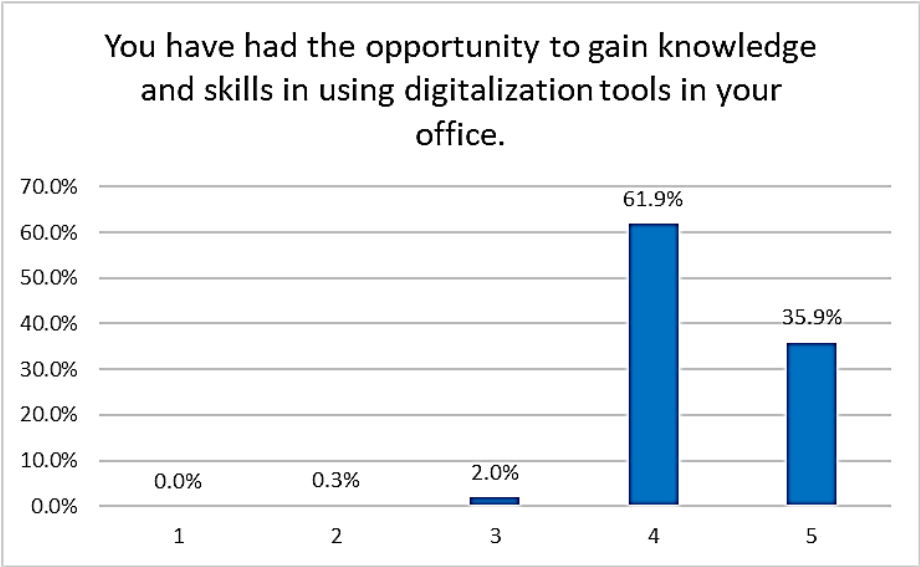


Figure 8. Opportunities to acquire knowledge and skills in the use of digitalisation tools.

The data in Figure 8 show that local government units representatives are not fully convinced that they have been enabled to acquire knowledge and skills in the use of digitalisation tools in they work. The majority of respondents (61.9%) were uncertain about this. It is worth noting that there are hardly any negative opinions in this area (0.3% "rather not").

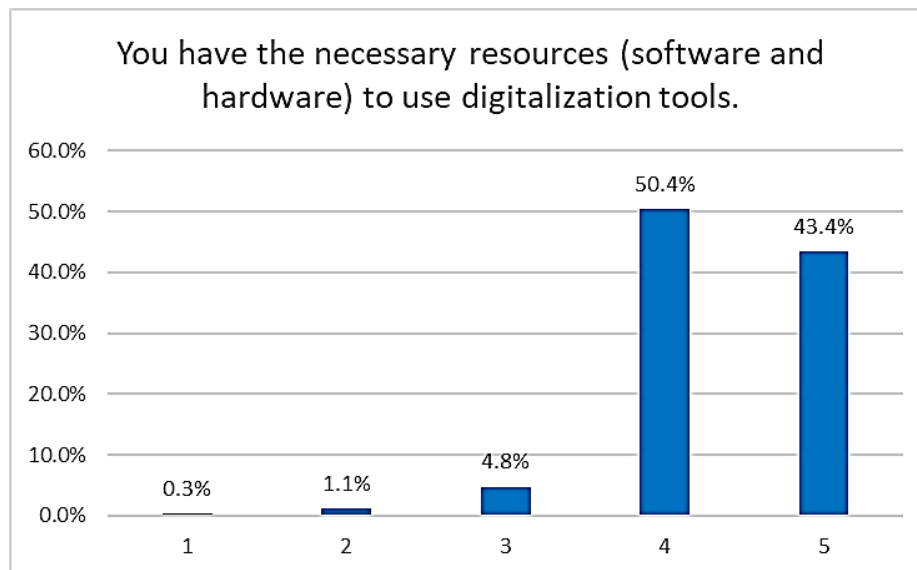


Figure 9. Equipping an employee with the necessary resources to use digitalisation tools.

In the context of having the necessary resources for using digitalisation tools, half of the respondents answered affirmatively, albeit without conviction, indicating that these resources (software and hardware) have been provided, but not entirely recognized by the employees. Although 43.4% of the local government units surveyed strongly agreed with this statement. One in twenty respondents had no opinion in this area and 1.4% felt that they had not been provided with the necessary resources to use digital facilities (fig. 9).

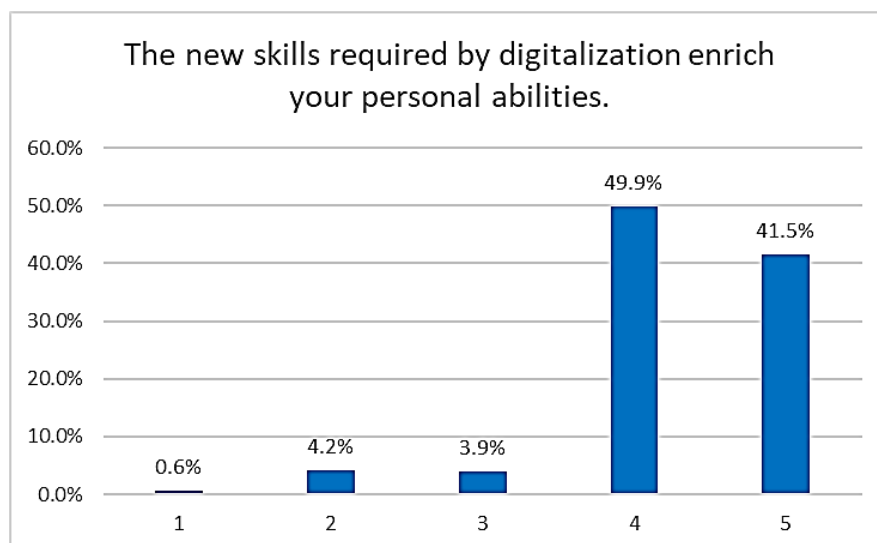


Figure 10. The impact of digitalisation on employee competence development.

The data in Figure 10 show that respondents believe that the new skills required by digitalisation enrich their personal competences. Although half of those who support this view are unsure, a similar proportion strongly support it (41.5%). Almost one in twenty respondents felt that the digitalisation of work had no impact on the development of their competences, and 3.9% were unable to answer this question.

6. Conclusions

The survey concludes that representatives of local government units generally perceive digitalisation tools as having a positive impact on their work outcomes and the quality of provided public services. Across all surveyed areas, opinions are divided between those seeing the positive effects of digitalisation tools and those who hold a more tentative positive stance. For the undecided respondents, it is plausible to posit that they may require additional time to acquaint themselves with the potential of digitalisation, or they might be hesitant to adopt new approaches. Investigating the barriers to digitalisation within public administrations could be a direction for future research.

The research also confirms that the adoption of digitalisation tools improves the scope of collaboration with public services, private companies and NGOs. The majority of respondents were uncertain about this, but almost one in three strongly agreed, indicating an increase in the level of cooperation. Collaboration in emergency management is the interaction of independent organisations and the search for common solutions to achieve the goal of saving lives and health of people in crisis situations. Kozuch and Sienkiewicz-Małyjurek (2015, p. 245) draw attention to the need for inter-organisational collaboration in crisis management, pointing out the importance of collaboration between the state administration and executive units, the civil sphere and NGOs. Many available studies focus precisely on improving the level of collaboration in crisis management (Witkowski, Marcinkowski, 2022; Frykmer, Tehler, Uhr, Wester, 2021; Supreme Audit Office, 2017; Sienkiewicz-Małyjurek, 2012; Silvia, McGuire, 2010; Blecken, Heidelberg, 2009).

Research demonstrates that digitalisation enables administrative employees to accomplish their tasks faster. This is particularly important in crisis management. When a disaster strikes, it is necessary to react immediately, as time is a key determinant of the effectiveness of actions during crisis situations (Marjanski, 2015). Research has shown that the new skills required by digitalisation enrich the personal competences of representatives of public administration. This is relevant in the context of public crisis management activities. The reports of the Supreme Audit Office (2017 and 2019) raise concerns about the organisational preparation for the implementation of tasks at the two main levels of crisis management, i.e. the county and the municipality, including the substantive qualifications of employees. In the opinion of the Supreme Audit Office (2017 and 2019), the scale of irregularities identified at the county and municipality levels poses a serious risk of inadequate implementation of crisis management tasks. Against this background, the tools of digitalisation can have a positive impact on increasing the competence of representatives of TSUs, including officials in crisis management structures.

The representatives of local government units are not entirely convinced that they have been provided with the opportunity to acquire knowledge and skills in using digitalisation tools. Although the majority believe that such conditions have been created, the highest percentage among them are those who are unsure of their opinion.

In summary, the digitalisation of public administration is viewed positively by respondents. Digitalisation tools have an impact on the speed with which tasks are carried out, and the respondents themselves believe that they are better able to identify and respond to the needs of citizens. In the field of public crisis management, as well as in public administration management as a whole, digitalisation tools, together with an increase in awareness and the development of staff's ability to use such digital means, can help to meet the needs of the citizens more effectively and ensure their safety to a greater extent. The level of security of the state and its citizens is increased through automation and improved access to information, as well as increased transparency of operations. Digitalisation tools also increase the responsiveness of crisis management, for example through the RCB's emergency alert system. Modern times are characterised by high dynamics and volatility, and the progress of civilisation is associated with an increased risk of disasters, both man-made and natural. In general, the increasing number and cost of crisis situations highlights the need for state-of-the-art technological tools, including digitalisation tools.

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