Introducing AI and Automation in Local Governance: Findings from Slovak Municipalities

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Abstract

Artificial intelligence (AI) is currently undergoing rapid development. On the one hand, it offers significant potential for local governments to increase efficiency, improve data-driven decision-making, and provide better services to residents; on the other hand, it brings ethical challenges and concerns. The topic is relatively new in the CEE region, yet several studies have already examined AI implementation in municipal governance. For example, research in 47 municipalities in Poland explored the use of AI in flood-risk crisis management (Wrzalik, 2021). Wolniak and Stecuła (2024) studied the application of AI within the smart-city concept and identified three core challenges for responsible and equitable deployment of AI in local government: ethical issues, the digital divide, and security and compliance concerns. A survey of officials in 414 Polish cities and public-sector managers highlighted major barriers to AI adoption, including the lack of strategy and planning, insufficient safeguards to ensure alignment with human values, limited employee knowledge, inadequate policies and regulations, and differing stakeholder expectations (Mohyjurek, 2023). Furthermore, Yigitcanlar et al. (2021) emphasize the growing need for local governments to make informed, responsible decisions when developing and deploying AI systems, as these systems directly affect residents' lives. An additional study analyzing strategic documents from local governments worldwide (e.g., Scandinavian cities) found that even the most advanced municipalities are only

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gradually integrating responsible-AI principles, emphasizing participation and awareness more often than adaptability or sustainability (David et al., 2024).

This paper focuses on the implementation of new technologies - automation, robotization, and AI - into local government processes in Slovakia. It draws on results from a 2025 nationwide survey conducted in cooperation with ZMOS among 535 municipalities, examining the state of AI, automation, and robotization in Slovak local governments. The aim is to present key findings on municipal awareness of these technologies, their current use, and the main barriers and perceptions of local decision-makers. The quantitative analysis also examines differences between municipalities of various sizes.

The study reveals an urgent need for capacity-building, training, and the sharing of good practice to support responsible, equitable, and context-sensitive AI adoption in Slovak local government, contributing empirical evidence to the CEE digital-government discourse.

Points for practitioners

The findings generate several key policy implications for the adoption of AI and related technologies in local government. First, capacity building is essential. The limited knowledge and experience among municipal representatives indicate a need for targeted training programs focused on practical AI use, data literacy, and ethical considerations. Second, there is a need for a clear strategic framework. Policymakers should develop national guidelines and implementation roadmaps for AI in local government, tailored to municipalities of different sizes. Third, targeted financial and technical support is necessary, particularly for smaller municipalities that face greater resource and expertise constraints. Mechanisms such as dedicated funding schemes or shared service models could help reduce disparities. Fourth, promoting knowledge sharing and best practices is crucial. Platforms for exchanging experiences, pilot projects, and case studies can accelerate adoption and reduce fragmentation. Fifth, regulatory and ethical frameworks should be strengthened. Municipalities favor the establishment of rules, suggesting a need for policies that ensure transparency, accountability, and data protection while maintaining flexibility for innovation. Sixth, policies must address digital inclusion. Concerns about reduced accessibility for older populations highlight the importance of maintaining alternative service channels and supporting digital skills development. Seventh, policymakers should focus on priority application areas, particularly energy, public lighting, security, administration, and transport, where municipalities see the greatest potential for automation. Finally, strengthening human resource capacities in public administration is critical, as successful technology adoption depends on the availability of skilled personnel. Overall, a coordinated policy approach that combines training, strategic guidance, funding, regulation, and measures to promote inclusivity is necessary to ensure effective and responsible AI adoption by local governments.

Keywords: local governance, municipality, artificial intelligence, automation, Slovakia

1. Introduction

At present, there is a rapid development of artificial intelligence (AI), which also holds significant potential for local governments to streamline processes, improve data-driven decision-making, and deliver higher-quality services to residents. However, the advantages and disadvantages of AI are evident; AI governance still poses a challenge for policymakers (Djeffal, Siewert & Wurster, 2022) and requires collaboration with other actors, such as research institutions and technology companies (Sepasspour, 2023).

In the public sector, Alshahrani et al. (2024) examine the growing role of AI in government decision-making processes and discuss both its opportunities and associated challenges. The authors argue that AI can significantly improve public-sector efficiency, policy analysis, and service delivery by enabling faster, data-driven decision-making across government functions. At the same time, the study highlights important concerns related to transparency, accountability, ethical governance, data privacy, and public trust, emphasizing the need for responsible AI frameworks and further research into the long-term implications of AI adoption in public administration.

In the local public sector landscape, Yigitcanlar et al. (2024a) provide a comprehensive overview of how AI has evolved within local government over the past fifty years. The authors examine major research trends, technological developments, and evolving municipal priorities regarding AI adoption in public administration. The study is particularly valuable because it identifies existing research gaps and highlights future directions for AI-driven governance at the municipal level. Yigitcanlar et al. (2024b) investigate 262 AI implementation cases across 170 local governments worldwide to identify successful adoption strategies. The authors emphasize that organizational readiness, leadership support, and data governance are critical factors influencing effective AI deployment in municipalities. The article also presents practical recommendations that can help local governments improve public services and operational efficiency through AI technologies. Earlier, Yigitcanlar, Agdas, and Degirmenci (2023) examined the human and managerial dimensions of AI adoption in municipalities. They explored how city managers perceive the opportunities and challenges associated with AI in local administration. The findings show that local government leaders recognize AI's potential to improve decision-making, citizen services, and administrative efficiency, but they also express concerns regarding ethics, privacy, and transparency. The development and implementation of responsible AI strategies within municipal administration is investigated by David et al. (2024). The authors analyze policy documents and governance frameworks to evaluate how cities address transparency, accountability, fairness, and ethical concerns related to AI use. The article demonstrates that responsible AI governance is becoming an essential component of modern local public administration and digital transformation initiatives. In line with the topic of Yigitcanlar, Agdas, and Degirmenci (2023), and David et al. (2024), organizational and ethical dilemmas that local governments face when implementing AI systems are a focal point of the paper by Heinisuo, Kuoppakangas, and Stenvall (2025), too. They discuss issues such as accountability, public trust, employee resistance, and the complexity of integrating AI into existing administrative processes. The study highlights the importance of responsible governance frameworks and strategic planning to ensure the successful and ethical adoption of AI in the public sector. Lartey and Law (2025) focus on the use of AI in urban planning and local governance processes. They explain how AI technologies support data-driven decision-making, infrastructure management, and smart city development initiatives. On the same vein as previous authors (e.g., Djeffal, Siewert & Wurster, 2022; Yigitcanlar, Agdas & Degirmenci, 2023; Alshahrani et al., 2024; David et

al., 2024; Yigitcanlar et al. (2024b); Heinisuo, Kuoppakangas & Stenvall, 2025), authors conclude that AI has significant potential to improve urban planning efficiency, although challenges related to data quality, governance, and public accountability remain important concerns.

In Slovakia, the topic of AI use in the public sector at all levels of the government remains relatively new. The European Commission's AI Watch report on Slovakia describes national initiatives supporting the deployment of AI in public administration, including ethical AI governance, open data systems, and AI innovation ecosystems connected to public institutions. The report also discusses the role of Slovak governmental bodies and municipalities in digital transformation and AI adoption (European Commission, 2021). Hardy (2021) provides a comparative analysis of AI strategies and policy development within the Visegrad Four countries. The policy paper highlights that AI adoption in public administration across the V4 remains at an early stage, although governments increasingly recognize AI's potential to improve public services, reduce bureaucracy, and enhance administrative efficiency. The author also emphasizes the lack of regional coordination in AI governance and argues that future AI development in the V4 should focus on ethical standards, transparency, security, and stronger cross-border collaboration. In the Slovak landscape, Drahošová and Čajková (2024) analyze the positioning of AI within public sector projects in Slovakia, including applications relevant to local and regional government institutions. The study highlights that Slovakia's digital transformation strategies and AI action plans support the gradual implementation of AI technologies in public administration, particularly in service delivery and administrative efficiency. The authors also identify important challenges related to regulation, organizational readiness, employee competencies, and ethical governance, emphasizing the need for stronger institutional support and practical implementation frameworks in Slovak municipalities.

However, the topic of AI use by Slovak local governments is underexplored. On the contrary, examples of insights from international research addressing the effective and ethical implementation of AI in European local governments are available. For instance, a study conducted across 47 municipalities in Poland examined the potential use of AI in flood risk crisis management (Wrzalik, 2021). Another domain in which AI implementation is integral is the transformation of municipal governments into so-called smart cities. Wolniak and Stecuła (2024) investigated the application of AI across six key domains of the smart city concept: smart mobility, smart environment, smart governance, smart living, smart economy, and smart people. The authors identified three major challenges related to the responsible and equitable deployment of AI in local governance: addressing ethical issues, the digital divide, and security and regulatory compliance concerns (Wolniak & Stecuła, 2024). Based on a survey conducted among officials in 414 Polish cities and managers of public institutions in Poland, the following main barriers to AI adoption were identified: the absence of strategies and plans; insufficient safeguards to ensure that AI is used in alignment with human values; inadequate employee knowledge on how to use AI; insufficient policies, laws, and regulations concerning AI; and differing expectations among stakeholders and partners regarding AI (Mohyjurek, 2023). Moreover, according to Yigitcanlar et al. (2021), it is increasingly urgent for local governments to make informed and responsible decisions in the development and deployment of AI systems, ensuring a deep understanding of how these systems make decisions, as their outcomes directly affect residents' lives. Another study employing text analysis examined strategic documents of municipal governments worldwide (e.g., Scandinavian cities) available in English and found that even the most advanced cities are only gradually integrating principles of responsible AI, most frequently emphasizing participation and awareness, while placing less emphasis on adaptability and sustainability (David et al., 2024).

International experience thus provides a foundational basis for addressing the broad issue of implementing new technologies - automation, robotization, and AI - into local government processes in Slovakia.

To obtain information on the current state of technology use in Slovak municipalities, the Association of Towns and Communities of Slovakia (ZMOS) conducted a unique questionnaire survey of its member municipalities in May 2025. The following study summarizes the main findings of this survey.

2. Methods and Data

The primary objective of the questionnaire survey was to examine the current state of AI, automation, and robotization use in Slovak municipalities, identify barriers to their implementation, and assess the attitudes of municipal employees and elected representatives toward these technologies.

The questionnaire was designed to be comprehensible even for respondents without prior experience with AI and automation. At the outset, three key concepts addressed in the survey - AI, automation, and robotization - were clearly defined. The questionnaire consisted of 24 questions, predominantly closed-ended, allowing respondents to indicate areas of AI, robotization, and automation use, modes of implementation, perceived advantages and disadvantages, as well as their experiences, knowledge, and attitudes.

A total of 535[4] municipalities participated in the survey, representing 18.5% of all municipalities in Slovakia. All size categories of municipalities were represented in the sample (Table 1). The largest shares were municipalities with 500-999 inhabitants (28.8%) and those with 200-499 inhabitants (23.2%). Overall, nearly two-thirds of the sample consisted of small municipalities with up to 1,000 inhabitants, reflecting the overall structure of Slovak local government (Table 1). In contrast, municipalities with more than 20,000 inhabitants accounted for only 2.2% of the sample.

In terms of regional distribution, the highest participation was recorded from the Banská Bystrica Region (23.6%), followed by the Prešov Region (20%) and the Košice Region (15.5%). The sample structure adequately reflects the size distribution of municipalities across regions in Slovakia (Table 2).

Tab. 1. Comparison of size categories in the sample and in SR

Size category	No. of municipalities in the sample	%	No. of municipalities total*	%
Up to 199	70	13,1	415	14,4
200 - 499	124	23,2	703	24,3
500 - 999	154	28,8	732	25,3
1000 - 1999	110	20,6	597	20,7
2000 - 4999	47	8,8	306	10,6
5000 - 9999	11	2,1	69	2,4
10000 - 19999	7	1,3	34	1,2
20000 - 49999	12	2,2	34	1,2
Total	535	100	2896	100

Note: *Data source: Size categories of municipalities – Slovak Republic, regions, and districts (Statistical Office of the Slovak Republic, 2025)

[4] out of a total of 2,896 municipalities (Statistical Office of the Slovak Republic, 2025)

Tab 2. Sample structure according to the SR regions

Region	No. of municipalities in the sample	%	No. of municipalities total*	%
Banská Bystrica	126	23,6	515	17,8
Bratislava	18	3,4	72	2,5
Košice	83	15,5	441	15,2
Nitra	63	11,8	356	12,3
Prešov	107	20,0	666	23,0
Trenčín	41	7,7	276	9,5
Trnava	44	8,2	251	8,7
Žilina	53	9,9	319	11,0
Total	535	100	2896	100

Note: *Data source: Size categories of municipalities – Slovak Republic, regions, and districts (Statistical Office of the Slovak Republic, 2025)

The representation of different types of respondents who completed the questionnaire on behalf of the participating municipalities is presented in Table 3. The dominant group consisted of mayors (nearly 70%), indicating a high level of engagement from senior local government officials. The second largest group comprised professional administrative staff (15.5%). The smallest representation was observed among chief municipal officers (3.4%). The category "other" (11.4%) primarily included administrative personnel and staff.

Tab 3. Positions of respondents in the sample

	No. of municipalities in the sample	%
Mayor	373	69,7
Referee	83	15,5
Other	61	11,4
Chief municipal officer	18	3,4
Total	535	100

3. Results on Knowledge and Experience with AI and Automation in Local Government in Slovakia

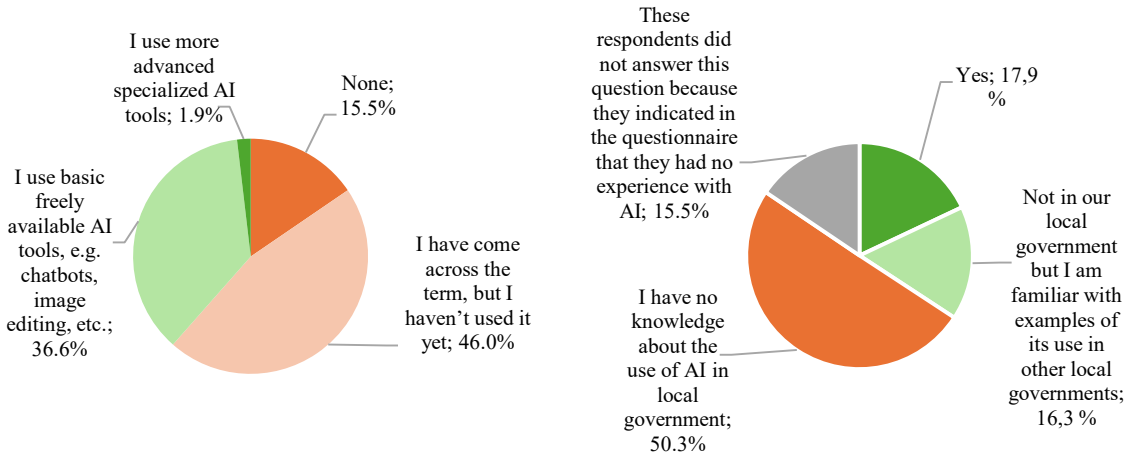
3.1 Artificial Intelligence in Local Government in Slovakia

The survey conceptualized the AI as "technologies and algorithms that enable computer systems to perform tasks requiring intelligence, such as pattern recognition, data analysis, trend prediction, and automated communication. In local government, it can be used to process large volumes of data in budget planning, predict traffic flows, or provide responses to citizens through chatbots."

Respondents' experience with AI was assessed through the question: "What are your experiences with AI?" Nearly half of the respondents (46%) indicated that they were familiar with the concept of AI but do not currently use it. More than one-third (36.6%) reported using basic, readily available AI tools, such as chatbots. Only a very small proportion (1.9%) reported using more advanced solutions (Figure 1, left side).

Another question - "Have you already come into contact with AI within your municipality?"- examined the extent of practical exposure of municipalities to AI applications (Figure 1, right side). Only 18% of respondents confirmed the use of AI in their municipality, while an additional 16% reported experiencing AI in another municipality. In contrast, half of the respondents indicated no awareness of such activities. This suggests that, in practice, AI is not yet widely used across the majority of municipalities.

Figure 1 Respondents' Experience with AI and Experience with the Use of AI in Local Government

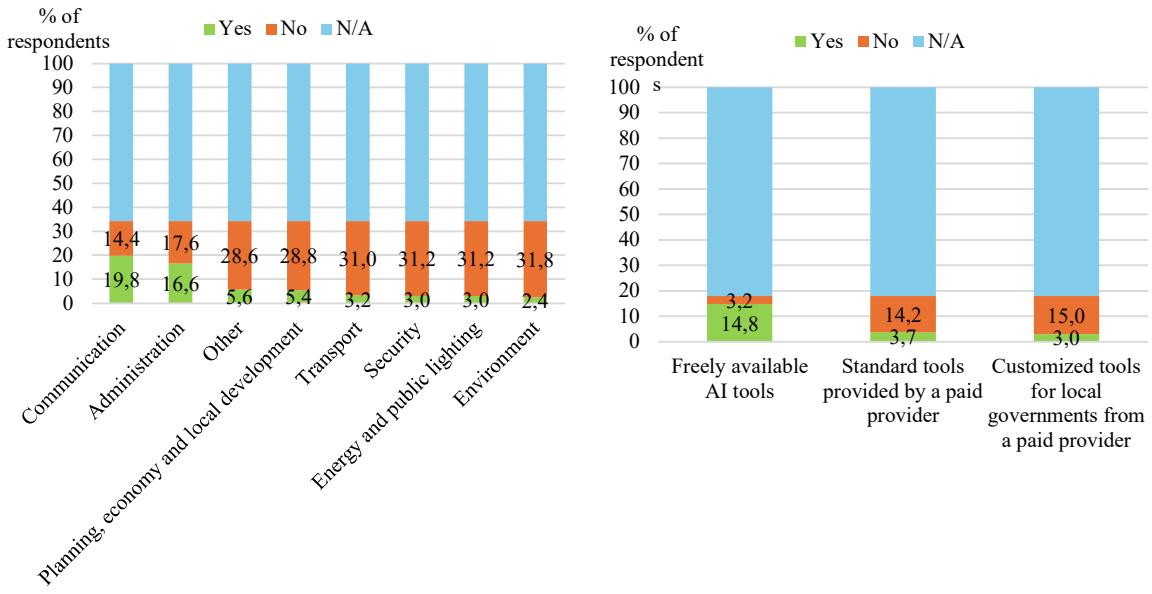


Respondents who answered "Yes" or "Not in our municipality, but I am aware of examples of AI use in other municipalities" in the previous question (together representing 34.2% of all respondents) were given the opportunity to specify the areas in which AI is being applied in local government (Figure 2, left side). In this question, respondents could select all relevant areas. Figure 2 (left side) shows, for each listed area, the proportion of respondents who selected it. AI is most frequently used in administration (16.6%) and communication (19.8%). A substantially smaller proportion of respondents (5.4%) identified planning, economic management, and local development. In other areas - such as security, transport, energy, and the environment - current usage remains very low (reported by approximately 3% of respondents).

Among respondents who had encountered AI in their municipality, further inquiry examined how AI services are procured or implemented (Figure 2, right side). The responses indicate that municipalities primarily rely on freely available AI tools (14.8%). Only a smaller proportion of municipalities use paid services, whether standard (3.7%) or customized solutions (3.0%). The question was posed only to respondents who had encountered AI in their municipality (17.9% of respondents). The remaining 82.1% are shown as "N/A" (response not available) in the figure.

In response to the question "What are the annual costs of AI services in your municipality?", only 23 respondents (4% of the sample) reported incurring expenditures on AI, with costs ranging from €99 to €3,875. The average reported expenditure was €731, while the median value was €282.

Figure 2 Response to the Questions: "Which Areas of AI Use in Local Government Were Involved?" and "How Are AI Services Provided in Your Municipality?"



Respondents were also given the opportunity to describe their experience with AI in an open-ended question, which was completed by 134 respondents.

The most frequently reported AI tools and use cases included:

- The use of ChatGPT and other AI-based search tools for drafting texts, speeches, articles, announcements, administrative documents, emails, and for translation in communication with international partners.
- Content creation for websites and social media, including the preparation and editing of posts, announcements, posters, invitations, graphics, images, and route designs.
- Preparation of materials for municipal broadcasting (e.g., the ROZANA AI system), including the generation of announcements, broadcast preparation (such as moderator scripts), publishing notices on official boards, and text-to-speech conversion for local radio announcements; as well as speech-to-text transcription in tools such as Microsoft Word.
- Legal and administrative agenda, including searching for legislation, navigating legal frameworks, assisting with legal interpretation, drafting responses based on legislation, proposing administrative procedures, translating documents, extracting text from images, transcribing contracts for publication, designing forms and templates, producing minutes, preparing questionnaires, supporting public procurement processes, and counting voters during elections.
- Data analysis and processing, including document summarization, calculations (e.g., preparation of materials for energy market decisions, spatial monitoring, and security incident analysis).
- Project-related activities, including support in project preparation, drafting project proposals, and preparing grant applications (e.g., applications for non-repayable financial contributions).

A small number of respondents reported more advanced applications of AI, such as the use of VBA scripts for automating repetitive processes, spatial monitoring (e.g., detecting the emergence of potholes), lighting regulation, monitoring and management of security incidents, prevention of misdemeanors and criminal activities through camera systems, public parking management, park maintenance, waste collection optimization, and the analysis of large datasets.

Respondents more frequently emphasized perceived benefits and advantages, describing AI as a "significant aid," a "useful tool," a means of "facilitating work," "reducing the time required to complete various tasks," and improving "time efficiency, accuracy of information, and speed of retrieving relevant data." At the same time, they expressed a degree of caution, as reflected in statements such as "a good servant but a bad master," and pointed to limitations related to the impersonal nature of AI-generated communication. For example, one respondent noted: "We used AI approximately twice for funeral announcements, but the message was terse, impersonal, and lacked expressions of sympathy and emotion."

These responses also reflect a lack of experience, with many respondents reporting minimal or no practical use of AI, and several indicating that they use AI only for private purposes. At the same time, several respondents expressed interest in more extensive use of AI but identified institutional barriers, particularly financial constraints. As one respondent stated, "AI is more of a benefit, but the available tools are not sufficient for municipal needs. There are areas where I can envision its use significantly facilitating work; however, these are paid tools that the municipality cannot currently afford."

Respondents also provided recommendations, including developing shared service centers, a more systematic deployment of technologies, using AI to reduce personnel costs and increase process efficiency, and establishing standards for AI use in local government. As one respondent summarized: "Due to a certain degree of caution toward new technologies, AI is not yet used systematically. However, AI could simplify, automate, and optimize processes, thereby reducing municipal expenditure without negatively affecting the quality of services provided to citizens. I consider the concept of shared service centers, where AI and automation tools could be purposefully implemented, to be a particularly promising approach."

3.2 Automation and Robotization in Local Government

Similarly to AI, the questionnaire survey examined the extent of municipalities' practical exposure to automation and robotization separately.

To ensure conceptual clarity, the questionnaire provided definitions of both terms. Automation was defined as "the use of software and technical solutions to streamline and accelerate administrative and operational processes. For example, in local government, automation can support the digital processing of applications and submissions, automatic approval of documents, management of public finances, and more efficient maintenance of public spaces."

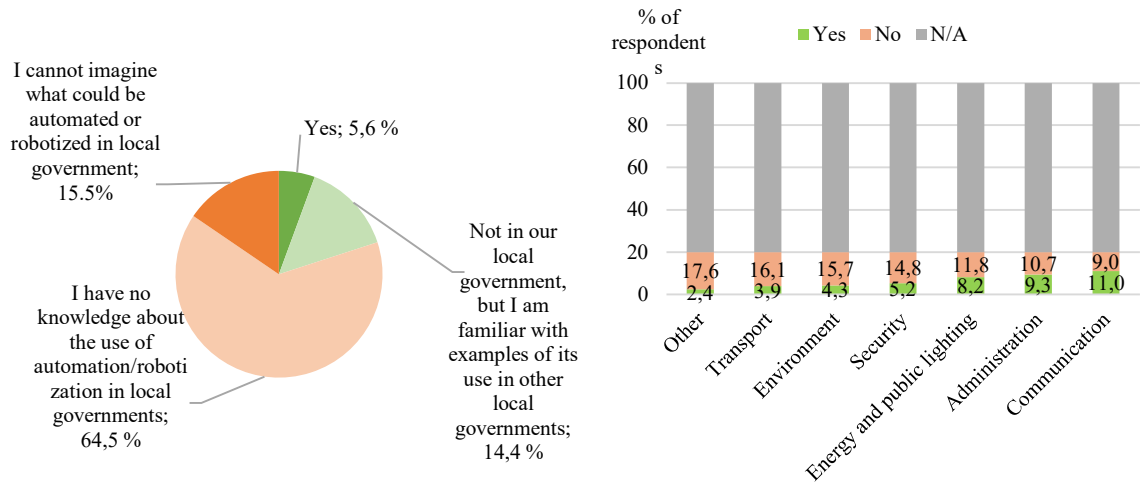
Robotization was defined as "the introduction of physical or virtual robots to perform repetitive or demanding tasks. In local governments, this may include autonomous cleaning machines in cities, robotic transport systems, security monitoring through intelligent sensors, or the deployment of voice assistants to facilitate communication with citizens."

The results presented in Figure 3 (left side) indicate that only 5.6% of municipalities report actual use of these technologies, while approximately two-thirds have no knowledge of the issue, and as many as 15.5% report being unable to identify any processes that could be automated or robotized within local government. This confirms that, compared to AI, these technologies are even less widespread in municipal practice.

Respondents who answered "Yes" or "Not in our municipality, but I am aware of examples of use in other municipalities" in the previous question (together representing 20.0% of all respondents) were given the opportunity to specify the areas in which automation or robotization is applied in local government (Figure 3, right side).

The survey indicates that municipalities most commonly apply automation/robotization in communication (11.0%), administration (9.3%), and in energy and public lighting (8.2%), while their use in areas such as security, transport, and the environment remains less frequent. The question was posed only to respondents who answered "Yes" or "Not in our municipality, but I am aware of examples of use in other municipalities" in the previous question, representing 20.0% of all respondents. The remaining 80.0% are displayed in the figure as "N/A" (response not available).

Figure 3 Proportion of Responses to the Questions: "Do You Use Automation/Robotization of Repetitive Activities in Your Municipality?" and "Which Areas of Use of Automation/Robotization Are Involved?"



The final question in this section captures respondents' subjective assessment of their level of knowledge regarding robotization and automation. Nearly half of the respondents (48.4%) reported no knowledge in this area, while only a very small proportion (0.6%) considered themselves highly knowledgeable.

Respondents were also asked to elaborate on their experiences with automation and robotization through an open-ended question. A total of 103 respondents provided answers, although many indicated that they had no direct experience. Based on the responses that included specific examples, the use of automation and robotization in local governments can be summarized as follows:

- Public lighting: analysis, automated switching on and off, remote management, fault reporting, and lighting systems activated based on light intensity.
- Green space management: robotic lawn mowers.

- Heating systems: remote management of central heating.
- Transport: automated traffic light control, traffic counters, license plate recognition, and smart traffic signals.
- Communication: automated sending of SMS and emails, repeated broadcasting of announcements via local radio, use of VBA scripts for automating repetitive processes, and automated social media and email communication with citizens (e.g., messages triggered by website registration).
- Administration and management: automatic publication of invoices and orders, automated payment matching, mail processing and sorting, and automated envelope-processing machines.
- Waste management: smart waste management solutions.
- Security and public cleanliness: intelligent sensors for security monitoring, camera systems with facial recognition, and robotic machines for cleaning public spaces.
- Sensor-based monitoring: use of sensors to monitor various parameters, such as indoor air quality in buildings and automated ventilation control.

3.3 Advantages and Disadvantages of the Use of AI and Automation/Robotization in Local Government

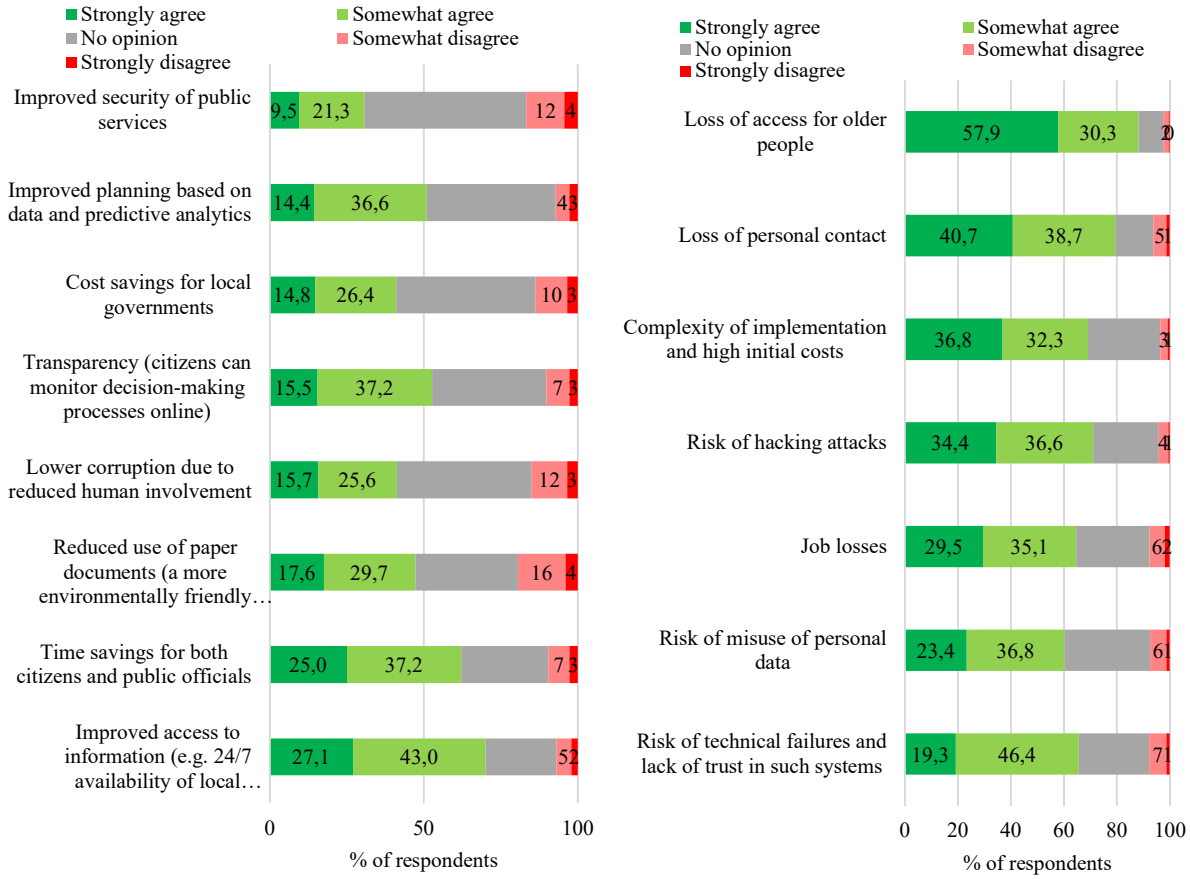
In the questionnaire, municipalities were asked how they perceive the advantages and disadvantages of new technologies (Figures 4, left side-advantages, right side - disadvantages). For clarity, affirmative responses are marked in green and negative responses in red. Overall, municipalities expressed greater agreement with the listed disadvantages than with the advantages.

Among the perceived benefits, the most prominent were improved access to information and online public services (70.1%), time savings for both citizens and municipal staff (62.2%), and increased transparency. The least agreement was observed for the benefit “improved security of public services” (30.8%), which is consistent with responses regarding disadvantages, where concerns about security risks - such as technical failures and data misuse - were evident.

The most frequently cited concerns included reduced accessibility for older populations (88.2%), likely due to lower levels of digital literacy, loss of personal contact (79.4%), and the risk of hacking attacks. At the same time, a notable degree of uncertainty or limited knowledge among respondents is reflected in the relatively high proportion of “don’t know” (no opinion) responses (40–50%) across several items, particularly when assessing potential benefits.

In open-ended responses, participants most commonly identified traditional advantages such as time savings, increased productivity, and efficiency. Reported disadvantages included the loss of personal interaction, risks of misuse, and the need for staff training.

Figure 4 Advantages and Disadvantages of Implementing AI and Automation in Local Government



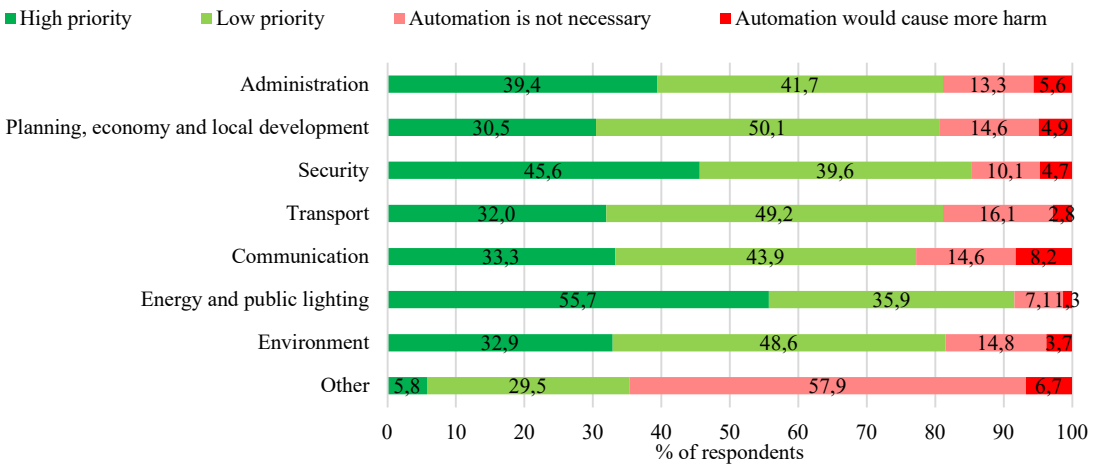
3.4 Priority Areas for the Use of Automation in Local Government

In the questionnaire, respondents were asked to identify the areas they consider most important for the implementation of new technologies through the question: "Which areas should, in your opinion, be prioritized for automation?"

The highest proportion of municipalities identified energy and public lighting (91.6%) and security (85%) as priority areas for automation in local government (Figure 5). Other areas were also perceived as highly relevant, with approximately 80% of respondents rating them as important.

Communication was considered less of a priority, with 23% of respondents indicating that automation in this area is either unnecessary or could have negative effects. This is a noteworthy finding, as results from previous questions showed that communication is currently one of the few areas where municipalities already apply AI tools or automation approaches, albeit to a limited extent.

Figure 5 Priority Areas for Automation in Local Government



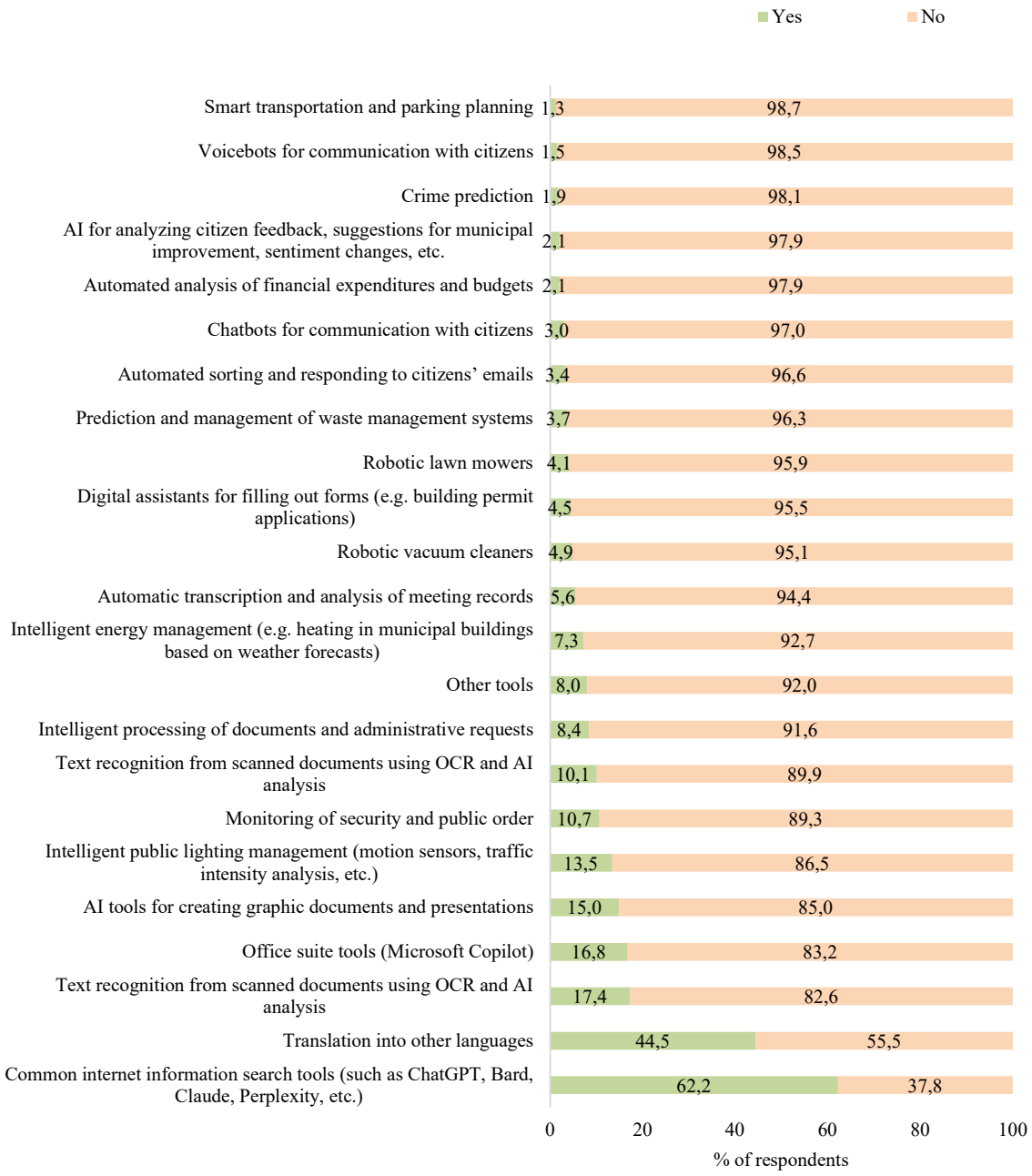
3.5 AI and Automation/Robotization Tools Used in Local Government

The survey results indicate that municipalities most frequently use simple and easily accessible AI applications designed for information retrieval, translation, OCR, and the creation of graphical documents and presentations, while more advanced tools for traffic management, citizen communication, and crime prediction are used only sporadically.

The most widely used tools are general-purpose online information retrieval systems (e.g., ChatGPT, Bard, Claude, Perplexity), utilized by 62.2% of municipalities (Figure 6). These are followed by translation tools (44.5%), OCR and AI-based text recognition from scanned documents (17.4%), and office suite tools (e.g., Microsoft Copilot) (16.8%). Intelligent public lighting management is used by 13.5% of municipalities, while security monitoring systems are employed by only 10.7%.

Conversely, the least commonly used solutions include smart transport and parking management (1.3%), voicebots for citizen communication (1.5%), crime prediction systems (1.9%), and AI tools for analyzing citizen feedback or municipal budgets (both 2.1%).

Figure 6 Proportion of "Yes" and "No" Responses for Individual Tools in the Question: "Which Automation, Artificial Intelligence, and Robotization Tools Do You Use in Your Municipality?"



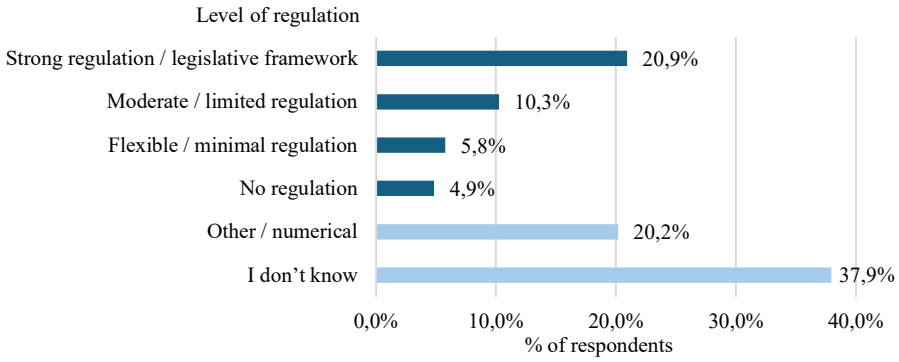
3.6 Level of Regulation of AI Use in Local Government

In the open-ended question "To what extent should the use of AI in local government be regulated, in your opinion?", respondents were given the opportunity to express their views on the current issue of AI regulation (Figure 7). The responses were coded and categorized into four groups, ranging from strong regulation to no regulation.

Some responses could not be classified (e.g., “other” or purely numerical answers), and as many as 38% of respondents were unable to express an opinion on the topic. Among those who provided a clear stance, the largest proportion of municipalities supported “strong regulation/a legislative framework” (20.9%), indicating that approximately one-fifth of municipalities consider strict rules and oversight essential for implementing AI. Moderate or limited regulation was supported by 10.3% of respondents. Flexible or minimal regulation was preferred by 5.8% of municipalities, while only 4.9% supported the view that AI should operate without any regulation.

Overall, the findings suggest that municipalities tend to favor a regulatory framework, while the complete absence of regulation receives only minimal support.

Figure 7 Perspectives on AI Regulation



4. Results on Analysis of Differences in the Adoption of AI and Automation/Robotization in Municipalities of Different Sizes

In the second part of the analysis, we examine differences in the adoption of AI and automation/robotization across municipalities of different sizes. For this purpose, municipalities were categorized into six size groups to ensure sufficient observations within each group for statistical analysis.

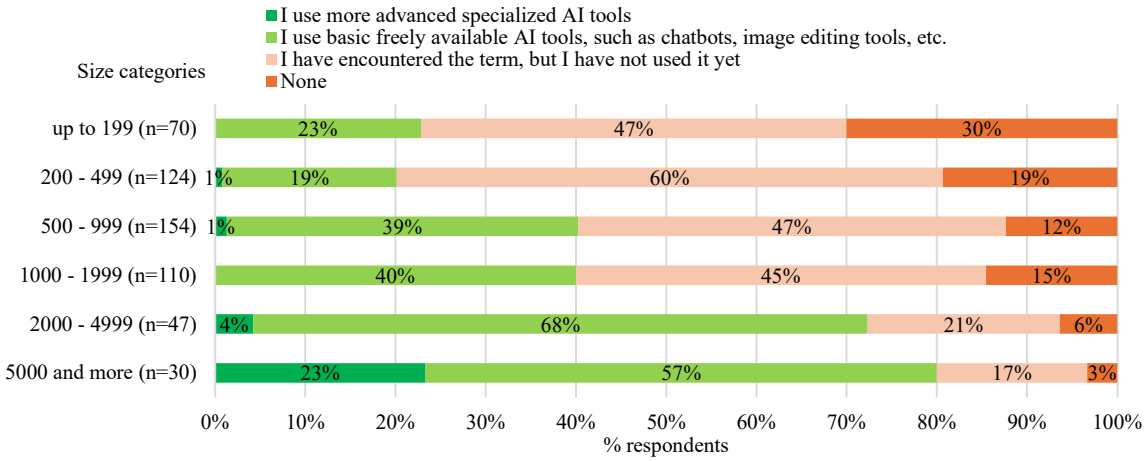
The analysis tested the relationship between municipal size and the intensity of adoption of new technologies. In addition, it explored whether the size of a municipality is associated with the specific areas in which these technologies are applied, as well as with the modes of their implementation.

4.1 Use of Artificial Intelligence According to Size Categories

When examining differences in the intensity of AI use across municipalities of varying sizes, it is evident that larger municipalities (cities) with more than 5,000 inhabitants are significantly more active than smaller municipalities (with fewer than 5,000 inhabitants). Nearly one-quarter of cities already use more advanced AI tools, and only 20% report not using AI at all.

A particularly pronounced gap is visible among municipalities with fewer than 2,000 inhabitants, where advanced AI tools are almost entirely absent, and the use of freely available AI applications remains relatively limited, ranging from 23% to 40% (Figure 8).

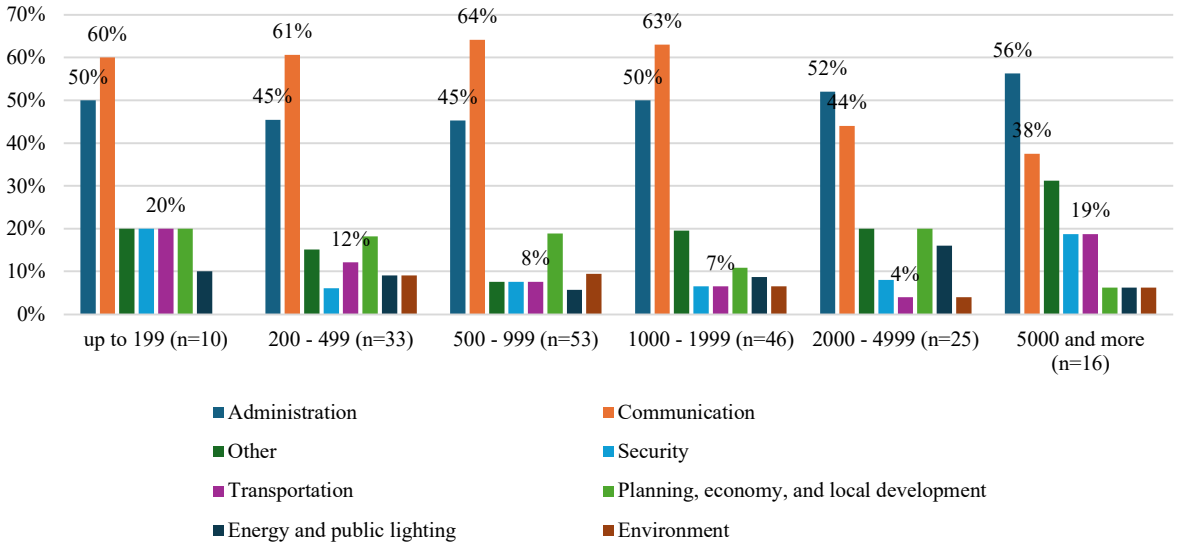
Figure 8 Experience with AI by Type of Use and Municipal Size Groups



To compare differences in AI applications across municipalities of varying sizes, we analyzed responses that included not only the actual use of AI in the surveyed municipalities but also respondents' awareness of AI use in other municipalities, covering 183 municipalities.

Across all size categories, municipalities reported using AI in all the areas listed in the questionnaire. In all categories, the primary domains of application are administration and communication. However, the relative importance of communication decreases in cities with more than 5,000 inhabitants, which tend to implement AI more extensively in other areas, such as transport (19%) and security (19%). In this category, there is also an increase in responses under "other," which likely reflects the broader range of services provided by larger municipalities and, consequently, greater opportunities for the application of new technologies (Figure 9).

Figure 9 Proportion of Municipalities That Have Encountered AI by Areas of Use and Municipal Size Groups



These results should be interpreted with caution, as the sample of 183 municipalities was not sufficiently large for robust statistical analysis, and the observed differences between municipal size categories did not reach statistical significance (see Table 4).

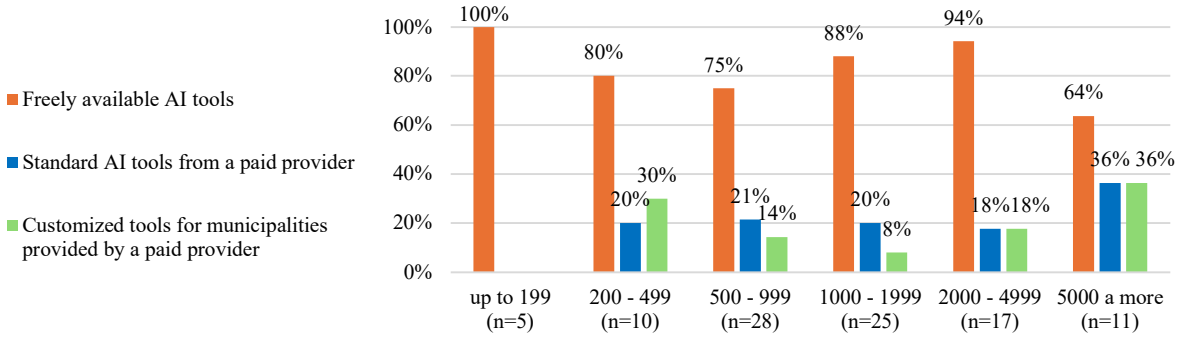
Tab. 4 Proportion of Municipalities Using AI by Areas of Application and Municipal Size Groups

	Administration	Planning, economy, and local development	Security	Transport	Communication	Energy and public lighting	Environment	Other
Up to 199 (n=10)	50,0%	20,0%	20,0%	20,0%	60,0%	10,0%	0,0%	20,0%
200 – 499 (n=33)	45,5%	18,2%	6,1%	12,1%	60,6%	9,1%	9,1%	15,2%
500 – 999 (n=53)	45,3%	18,9%	7,5%	7,5%	64,2%	5,7%	9,4%	7,5%
1000 – 1999 (n=46)	50,0%	10,9%	6,5%	6,5%	63,0%	8,7%	6,5%	19,6%
2000 – 4999 (n=25)	52,0%	20,0%	8,0%	4,0%	44,0%	16,0%	4,0%	20,0%
5000 and more (n=16)	56,3%	6,3%	18,8%	18,8%	37,5%	6,3%	6,3%	31,3%
Total (n=183)	48,6%	15,8%	8,7%	9,3%	57,9%	8,7%	7,1%	16,4%
Pearson chi-square test[1]	0,970	0,714?	0,508?	0,439?	0,289	0,787?	0,875?	0,277?

Note: * "≤ 0.05" indicates the result of a statistical test. It means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "?" denotes cases where the test result should be interpreted with caution, as indicative rather than definitive. This occurs when the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

When comparing differences in the provision of AI services across municipalities of varying sizes, the results suggest that the use of paid tools (whether standard or customized) increases with municipal size (Figure 10). It appears that the smallest municipalities rely almost exclusively on freely available solutions, whereas the largest municipalities tend to combine multiple tools, including paid ones. However, the differences between size categories are not statistically significant, which may be related to the small sample size (only 96 municipalities responded to this question).

Figure 10 Provision of AI Tools in Municipalities That Have Encountered AI, by Municipal Size Categories



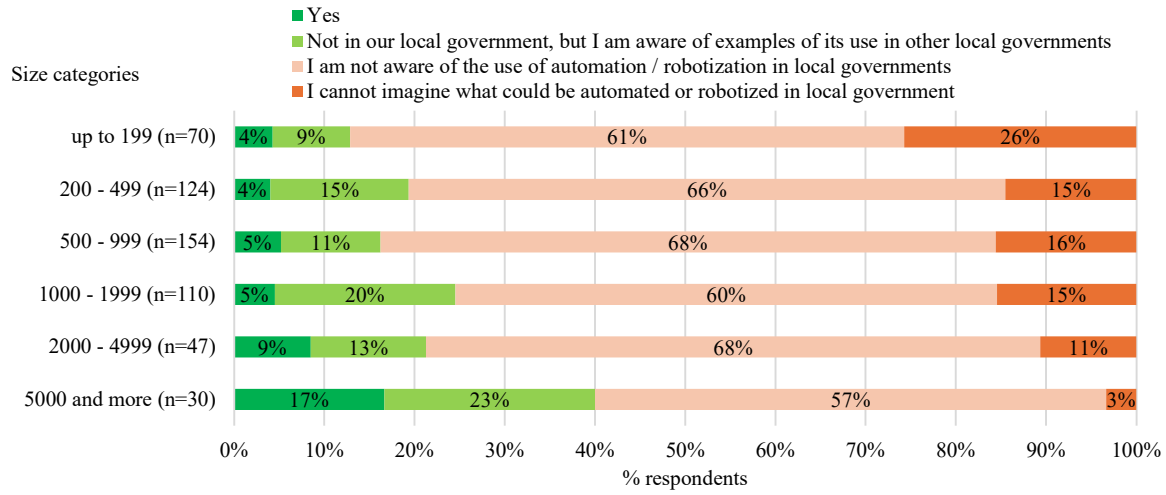
4.2 Use of Automation/Robotization According to Size Categories

When examining the use of automation/robotization processes across municipalities of different sizes, the results suggest that, similarly to AI, both awareness and the extent of implementation increase with municipal size. Among cities with more than 5,000 inhabitants, a proportion have already implemented such technologies (17%), while

others are familiar with their use in different municipalities (23.3%); however, 60% of cities have not yet encountered them.

In contrast, the situation in smaller municipalities (with fewer than 5,000 inhabitants) differs substantially. The level of adoption is significantly lower, and the majority of respondents - ranging from 76% to 87% - either cannot identify potential applications for automation/robotization or have no knowledge of these technologies (Figure 11). The statistical test result was at the threshold of statistical significance (p = 0.051) (see Table 5).

Figure 11 Use of Automation/Robotization of Repetitive Activities by Municipal Size Groups



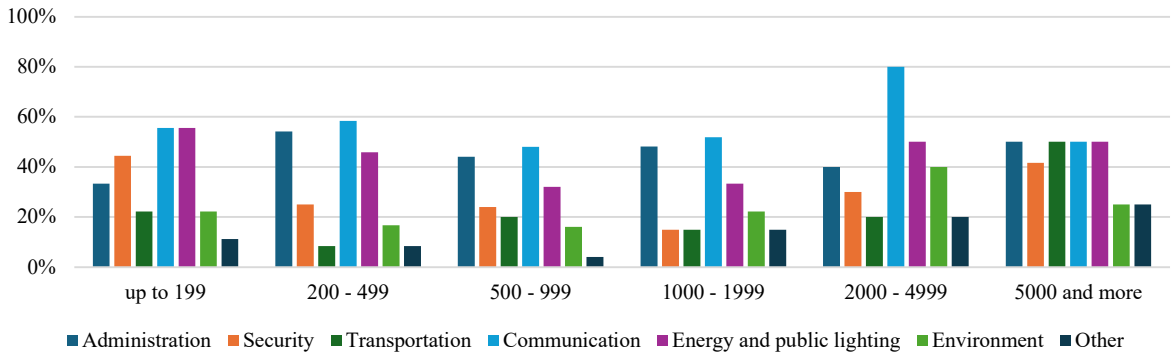
Tab. 5 Use of Automation/Robotization of Repetitive Activities by Municipal Size Groups

	Yes	Not in our local government, but I am familiar with examples of its use in other local governments	I have no knowledge about the use of automation/robotization in local governments	I cannot imagine what could be automated or robotized in local governments.
Up to 199 (n=70)	4,3%	8,6%	61,4%	25,7%
200 - 499 (n=124)	4,0%	15,3%	66,1%	14,5%
500 - 999 (n=154)	5,2%	11,0%	68,2%	15,6%
1000 - 1999 (n=110)	4,5%	20,0%	60,0%	15,5%
2000 - 4999 (n=47)	8,5%	12,8%	68,1%	10,6%
5000 and more (n=30)	16,7%	23,3%	56,7%	3,3%
Total (n=535)	5,6%	14,4%	64,5%	15,5%
Pearson chi-square test[1]	0,051[?]			

Note: [1] * "≤ 0.05" indicates the result of a statistical test. It means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "?" indicates a test result > 0.05 and ≤ 0.1. This means that the difference between groups is less conclusive (the result suggests a possible difference, but it is not definitively confirmed).

When comparing the areas of application of automation/robotization across municipalities of different sizes, the analysis included both respondents' direct experience (use within their municipality) and their awareness of such use in other municipalities. The results do not indicate substantial differences in the domains in which large and small municipalities implement automation. However, in larger municipalities, there is a higher proportion of responses categorized as "other," as well as increased use in more complex areas such as transport, security, and energy. Nevertheless, across all municipal size categories, automation is most commonly applied in administrative processes and communication (Figure 12). The differences observed are not statistically significant (see Tables 7 and 8).

Figure 12 Areas of Use of Automation/Robotization of Repetitive Activities by Municipal Size Groups



Tab. 6 Experience with Artificial Intelligence by Municipal Size Groups

	I use more advanced specialized AI tools	I use basic freely available AI tools: chatbots, image editing tools, etc.	I have come across the term, but I haven't used it yet.	None
Up to 199 (n=70)	0,0%	22,9%	47,1%	30,0%
200 - 499 (n=124)	0,8%	19,4%	60,5%	19,4%
500 - 999 (n=154)	1,3%	39,0%	47,4%	12,3%
1000 - 1999 (n=110)	0,0%	40,0%	45,5%	14,5%
2000 - 4999 (n=47)	4,3%	68,1%	21,3%	6,4%
5000 and more (n=30)	23,3%	56,7%	16,7%	3,3%
Total (n=535)	1,9%	36,6%	46,0%	15,5%
Pearson chi-square test[1]	0,000***			

Note: [1] A result of the Pearson chi-square test of independence ≤ 0.05 indicates that the difference between groups is statistically significant, meaning that the findings can be generalized to the overall population.

Tab. 7 Provision of AI Tools in Municipalities That Have Encountered AI, by Municipal Size Groups

	Freely available AI tools	Standard tools from a paid provider	Customized tools for local governments from a paid provider
Up to 199 (n=5)	100,0%	0,0%	0,0%
200 - 499 (n=10)	80,0%	20,0%	30,0%
500 - 999 (n=28)	75,0%	21,4%	14,3%
1000 - 1999 (n=25)	88,0%	20,0%	8,0%
2000 - 4999 (n=17)	94,1%	17,6%	17,6%
5000 and more (n=11)	63,6%	36,4%	36,4%
Total (n=96)	82,3%	20,8%	16,7%
Pearson chi-square test[1]	0,224?	0,692?	0,234?

Note: "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

Tab. 8 Areas of Use of Automation/Robotization of Repetitive Activities by Municipal Size Groups

	Administration	Security	Transport	Communication	Energy and public lighting	Environment	Other
Up to 199	33,33%	44,44%	22,22%	55,56%	55,56%	22,22%	11,11%
200 - 499	54,17%	25,00%	8,33%	58,33%	45,83%	16,67%	8,33%
500 - 999	44,00%	24,00%	20,00%	48,00%	32,00%	16,00%	4,00%
1000 - 1999	48,15%	14,81%	14,81%	51,85%	33,33%	22,22%	14,81%
2000 - 4999	40,00%	30,00%	20,00%	80,00%	50,00%	40,00%	20,00%
5000 and more	50,00%	41,67%	50,00%	50,00%	50,00%	25,00%	25,00%
Total	46,73%	26,17%	19,63%	55,14%	41,12%	21,50%	12,15%
Pearson chi-square test[1]	0,912?	0,416?	0,094?	0,645?	0,662?	0,714?	0,479?

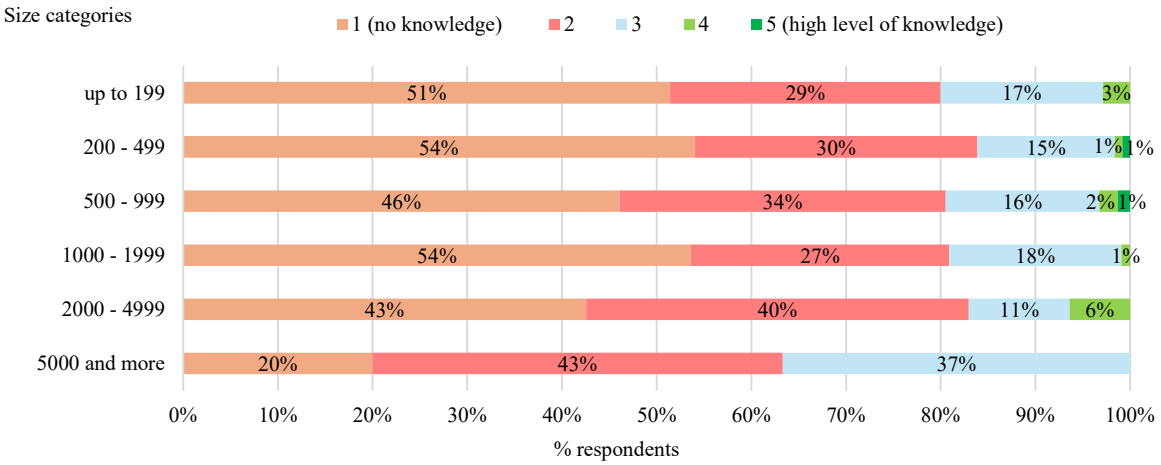
Note: [1] "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

The implementation of new technologies requires specific knowledge and leadership from senior local government officials. Therefore, we examined differences in the subjective assessment of knowledge regarding automation/robotization among respondents from municipalities of different sizes (Figure 13).

The results were not surprising, showing that respondents from municipalities with more than 5,000 inhabitants rated their level of knowledge higher than their counterparts in smaller municipalities. Notably, however, as many as 63% of them still reported very limited or had no knowledge of automation/robotization. Higher levels of knowledge (levels 4 and 5) appear in only a very small proportion of municipalities across all size categories, except for the group of municipalities with 2,000-4,999 inhabitants, where 6.4% of respondents reported level 4.

The results were not statistically significant (Pearson chi-square test of independence = 0.074, see Table 9).

Figure 13 Level of Knowledge of Respondents by Municipal Size Groups



Tab. 9 Subjective Level of Knowledge of Automation/Robotization in Local Government by Municipal Size Groups

	1 (no knowledge)	2	3	4	5 (high level of knowledge)
Up to 199	51,43%	28,57%	17,14%	2,86%	0,00%
200 - 499	54,03%	29,84%	14,52%	0,81%	0,81%
500 - 999	46,10%	34,42%	16,23%	1,95%	1,30%
1000 - 1999	53,64%	27,27%	18,18%	0,91%	0,00%
2000 - 4999	42,55%	40,43%	10,64%	6,38%	0,00%
5000 and more	20,00%	43,33%	36,67%	0,00%	0,00%
Total	48,41%	32,15%	17,01%	1,87%	0,56%
Pearson chi-square test[1]	0,074[?+]				

Note: [1] "+" indicates a test result > 0.05 and ≤ 0.1. This suggests that the difference between groups is less conclusive (the result points to a possible difference, but it is not definitively confirmed). "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

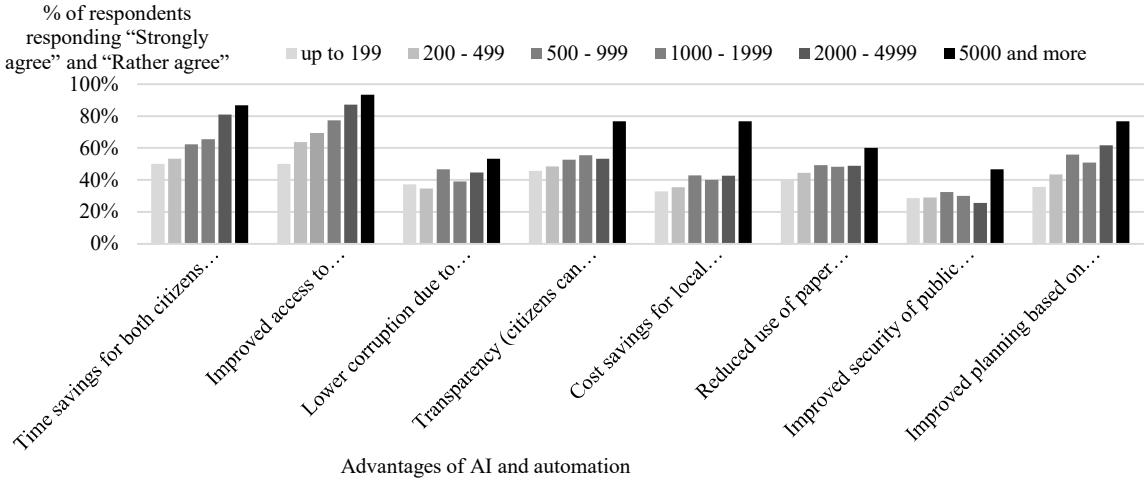
4.3 The Perception of Advantages and Disadvantages of the Use of AI and Automation/Robotization in Local Government According to Size Categories

The perception of the advantages and disadvantages of AI and automation across municipalities of different sizes (Figures 19 and 20) appears to vary across municipalities. Larger municipalities are more likely to agree with the positive effects, while smaller municipalities express greater concerns.

Municipalities with over 5,000 inhabitants particularly perceive benefits in improved access to information (e.g., 24/7 availability of public services online), with as many as 93.3% expressing agreement, and in time savings for both citizens and municipal staff (87%). In contrast, smaller municipalities do not consider these benefits as strongly (e.g., only 50% in municipalities with fewer than 200 inhabitants) (Figure 14).

Furthermore, larger municipalities place significantly greater emphasis on advantages such as improved data-driven planning and forecasting, enhanced security of public services, and cost savings. Differences in these areas were also confirmed by statistical testing, as the chi-square test of independence yielded statistically significant results (see Table 10).

Figure 14 Agreement with Statements* on the Advantages of Implementing AI and Automation in Local Government by Municipal Size Groups (*Responses "Strongly agree" and "Rather agree")



Tab. 10 Agreement with Statements[3] on the Advantages of Implementing AI and Automation in Local Government by Municipal Size Groups

	Time savings for both citizens and public officials	Improved access to information (e.g. 24/7 availability of local government services online)	Less corruption due to the reduced human factor	Transparency (citizens can monitor decision-making processes online)	Cost savings for local governments	Reduced use of paper documents (a more environmentally friendly approach, lower bureaucracy)	Improved security of public services	Improved planning based on data and predictions
Up to 199	50,0%	50,0%	37,1%	45,7%	32,9%	40,0%	28,6%	35,7%
200 - 499	53,2%	63,7%	34,7%	48,4%	35,5%	44,4%	29,0%	43,5%
500 - 999	62,3%	69,5%	46,8%	52,6%	42,9%	49,4%	32,5%	55,8%
1000 - 1999	65,5%	77,3%	39,1%	55,5%	40,0%	48,2%	30,0%	50,9%
2000 - 4999	80,9%	87,2%	44,7%	53,2%	42,6%	48,9%	25,5%	61,7%
5000 and more	86,7%	93,3%	53,3%	76,7%	76,7%	60,0%	46,7%	76,7%
Total	62,2%	70,1%	41,3%	52,7%	41,1%	47,3%	30,8%	51,0%
Pearson chi-square test[1,2]	0,001?*	0,000?*	0,080?+	0,477?	0,038?*	0,526	0,026?*	0,019?*

Note: [1] "*" indicates a test result ≤ 0.05. This means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "+" indicates a test result > 0.05 and ≤ 0.1. This suggests that the difference between groups is less conclusive (the result points to a possible difference, but it is not definitively confirmed). "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

Note: [2] The Pearson chi-square test assessed the full range of responses on the Likert scale (i.e., from "strongly agree" to "strongly disagree").

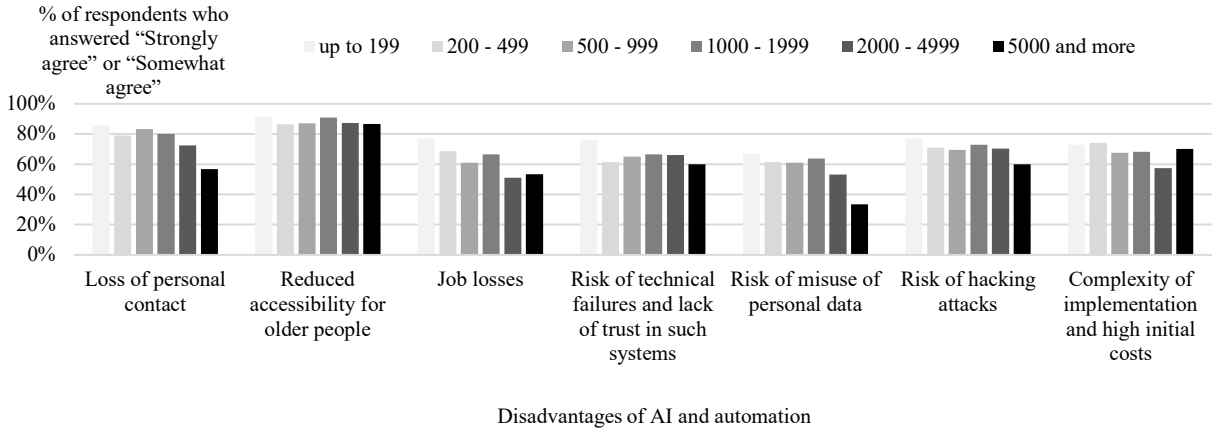
Note: [3] Responses "Strongly agree" and "Rather agree"

Smaller municipalities express significantly greater concern about the disadvantages, particularly the smallest ones with fewer than 200 inhabitants. Their main concerns include the loss of personal contact (most pronounced among municipalities with fewer than 200 inhabitants - up to 86%, compared to 57% among municipalities with more than 5,000 inhabitants). All categories of municipalities express concerns about reduced accessibility for older populations.

Smaller municipalities are also more concerned about job losses, while concerns about the misuse of personal data are reported by 33% of municipalities with more than 5,000 inhabitants, compared to 67% of municipalities with fewer than 200 inhabitants (Figure 15). This may indicate differing levels of awareness regarding information system security.

Differences were also observed in perceptions of the risks of cyberattacks, as well as the complexity and high costs of implementation. These differences were confirmed by statistical testing, as the chi-square test of independence yielded statistically significant results (see Table 11).

Figure 15 Agreement with Statements* on the Disadvantages of Implementing AI and Automation in Local Government by Municipal Size Groups (*Responses "Strongly agree" and "Somewhat agree")



Tab. 11 Agreement with Statements on the Disadvantages of Implementing AI and Automation in Local Government by Municipal Size Groups

	Loss of personal contact	Loss of access for older people	Job losses	Risk of technical failures and lack of trust in such systems	Risk of misuse of personal data	Risk of hacking attacks	Complexity of implementation and high initial costs
Up to 199	85,7%	91,4%	77,1%	75,7%	67,1%	77,1%	72,9%
200 - 499	79,0%	86,3%	68,5%	61,3%	61,3%	71,0%	74,2%
500 - 999	83,1%	87,0%	61,0%	64,9%	61,0%	69,5%	67,5%
1000 - 1999	80,0%	90,9%	66,4%	66,4%	63,6%	72,7%	68,2%
2000 - 4999	72,3%	87,2%	51,1%	66,0%	53,2%	70,2%	57,4%
5000 and more	56,7%	86,7%	53,3%	60,0%	33,3%	60,0%	70,0%
Total	79,4%	88,2%	64,7%	65,6%	60,2%	71,0%	69,2%
Pearson chi-square test[1]	0,007[?*]	0,009[?*]	0,000[?*]	0,504[?]	0,003[?*]	0,015[?*]	0,023[?*]

Note: [1] "*" indicates a test result ≤ 0.05. This means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "+" indicates a test result > 0.05 and ≤ 0.1. This suggests that the difference between groups is less conclusive (the result points to a possible difference, but it is not definitively confirmed). "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

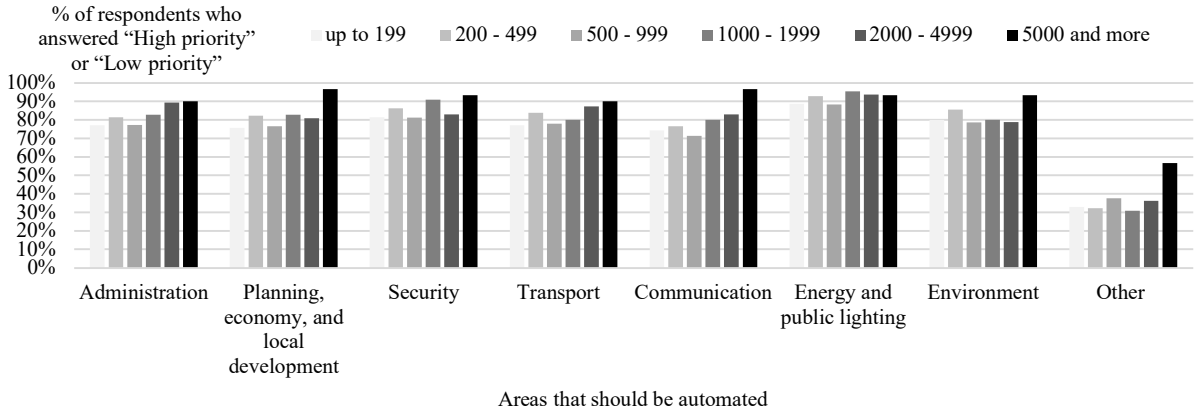
Note: [2] The Pearson chi-square test assessed the full range of responses on the Likert scale (i.e., from "strongly agree" to "strongly disagree").

4.4 Priority Areas for the Use of Automation in Local Government According to Size Categories

When comparing responses across municipalities of different sizes regarding which areas should be prioritized for automation (Figure 16), the results suggest that larger municipalities with more than 5,000 inhabitants have a greater need to automate processes across all listed areas.

The most pronounced differences were observed in two domains: "planning, economic management, and local development" and "communication," which are considered higher priorities in larger cities than in smaller municipalities. The differences between size groups in these areas are statistically significant, allowing the findings to be generalized to the overall population of municipalities in Slovakia (see Table 12).

Figure 16 Areas That Should Be Prioritized* for Automation According to Municipalities, by Sector and Municipal Size Groups (*Combined response: "high priority" and "low priority")



Tab. 12 Areas That Should Be Prioritized for Automation[3] According to Municipalities, by Municipal Size Categories

	Administration	Planning, economy, and local development	Security	Transport	Communication	Energy and public lighting	Environment	Other
Up to 199	77,1%	75,7%	81,4%	77,1%	74,3%	88,6%	80,0%	32,9%
200 - 499	81,5%	82,3%	86,3%	83,9%	76,6%	92,7%	85,5%	32,3%
500 - 999	77,3%	76,6%	81,2%	77,9%	71,4%	88,3%	78,6%	37,7%
1000 - 1999	82,7%	82,7%	90,9%	80,0%	80,0%	95,5%	80,0%	30,9%
2000 - 4999	89,4%	80,9%	83,0%	87,2%	83,0%	93,6%	78,7%	36,2%
5000 and more	90,0%	96,7%	93,3%	90,0%	96,7%	93,3%	93,3%	56,7%
Pearson chi-square test[1]	0,325	0,026*	0,344?	0,217?	0,011*	0,058?+	0,226?	0,398?

Note: [1] "*" indicates a test result ≤ 0.05. This means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "+" indicates a test result > 0.05 and ≤ 0.1. This suggests that the difference between groups is less conclusive (the result points to a possible difference, but it is not definitively confirmed). "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

Note: [2] The Pearson chi-square test assessed the full range of responses (i.e., from "High priority" to "Automation would cause more harm than benefit").

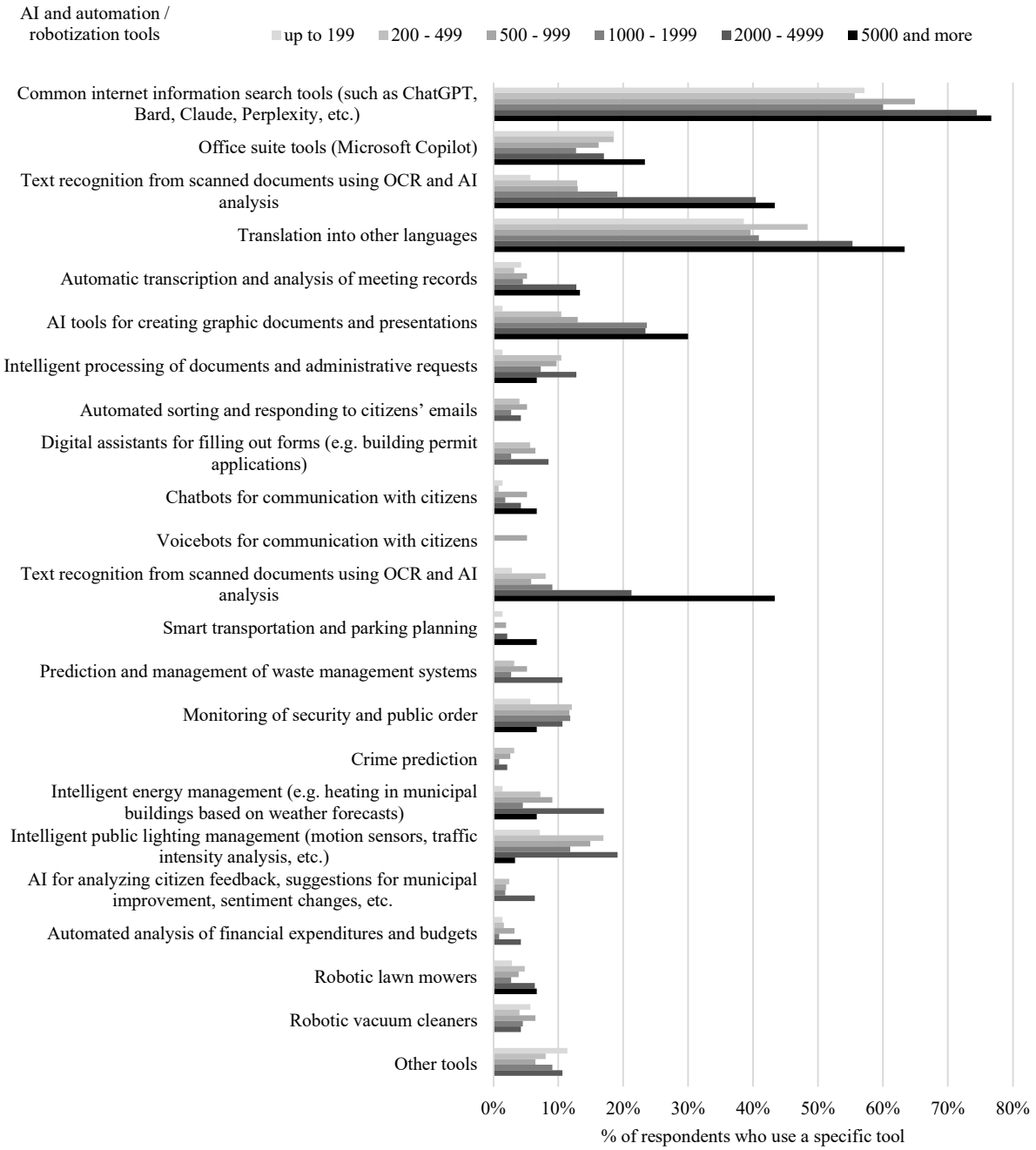
Note: [3] The question captures priority, combining the responses "high priority" and "low priority."

4.5 AI and Automation/Robotization Tools Used in Local Government According to Size Category

We examined differences between municipalities by analyzing responses to the question "Which tools of AI, automation, and robotization do you use in your municipality?" across size categories (Figure 17).

The results suggest that municipalities of all sizes use a broad range of tools, with the frequency of use increasing with municipal size across several tool types. This applies, for example, to general-purpose online information retrieval tools, AI tools for creating graphical documents, and text recognition from scanned documents, all of which showed statistically significant differences. A similar trend is observed for "translation into other languages," where larger municipalities tend to use these tools more frequently; however, the test result is slightly above the threshold of statistical significance, and this trend should therefore be interpreted with caution (see Table 13). Overall, the findings indicate that the most used AI functionalities are those that facilitate text processing, as well as graphical and administrative tasks.

Figure 17 AI, Automation/Robotization Tools Used by Municipalities by Size Groups



Tab. 13 AI, Automation/Robotization Tools Used by Municipalities by Size Groups

	Up to 199	200 - 499	500 - 999	1000 - 1999	2000 - 4999	5000 and more	Total	Pearson chi-square test[1]
Common internet information search tools (such as ChatGPT, Bard, Claude, Perplexity, etc.)	57,1%	55,6%	64,9%	60,0%	74,5%	76,7%	62,2%	0,093^{+}
Office suite tools (Microsoft Copilot)	18,6%	18,5%	16,2%	12,7%	17,0%	23,3%	16,8%	0,749
Text recognition from scanned documents using OCR and AI analysis	5,7%	12,9%	13,0%	19,1%	40,4%	43,3%	17,4%	0,000*
Translations into other languages	38,6%	48,4%	39,6%	40,9%	55,3%	63,3%	44,5%	0,066^{+}
Automatic transcriptions of meetings and their summaries/research	4,3%	3,2%	5,2%	4,5%	12,8%	13,3%	5,6%	0,082$^{?+}$
AI tools for creating graphic documents and presentations	1,4%	10,5%	13,0%	23,6%	23,4%	30,0%	15,0%	0,000*
Intelligent processing of documents and official requests	1,4%	10,5%	9,7%	7,3%	12,8%	6,7%	8,4%	0,225
Automated sorting and responding to citizens' emails	0,0%	4,0%	5,2%	2,7%	4,3%	0,0%	3,4%	0,359$^{?}$
Digital assistants for filling in forms (e.g. an application for a building permit)	0,0%	5,6%	6,5%	2,7%	8,5%	0,0%	4,5%	0,105$^{?}$
Chatbots for communication with citizens	1,4%	0,8%	5,2%	1,8%	4,3%	6,7%	3,0%	0,194$^{?}$
Voicebots for communication with citizens	0,0%	0,0%	5,2%	0,0%	0,0%	0,0%	1,5%	0,001$^{?*}$
Text recognition from scanned documents using OCR and AI analysis	2,9%	8,1%	5,8%	9,1%	21,3%	43,3%	10,1%	0,000*
Smart transport and parking planning	1,4%	0,0%	1,9%	0,0%	2,1%	6,7%	1,3%	0,062$^{?+}$
Prediction and management of waste management systems	0,0%	3,2%	5,2%	2,7%	10,6%	0,0%	3,7%	0,044$^{?*}$
Monitoring of safety and public order	5,7%	12,1%	11,7%	11,8%	10,6%	6,7%	10,7%	0,716
Crime prediction	0,0%	3,2%	2,6%	0,9%	2,1%	0,0%	1,9%	0,526$^{?}$
Intelligent energy management (e.g. heating in municipal buildings based on weather forecasts)	1,4%	7,3%	9,1%	4,5%	17,0%	6,7%	7,3%	0,033*
Intelligent public lighting management (motion sensors, analysis of movement intensity, etc.)	7,1%	16,9%	14,9%	11,8%	19,1%	3,3%	13,5%	0,147
AI for analyzing feedback from citizens, suggestions for improving the municipality, sentiment changes, etc.	0,0%	2,4%	1,9%	1,8%	6,4%	0,0%	2,1%	0,253$^{?}$
Automated analysis of financial expenditures and budgets	1,4%	1,6%	3,2%	0,9%	4,3%	0,0%	2,1%	0,576$^{?}$
Robotic lawn mowers	2,9%	4,8%	3,9%	2,7%	6,4%	6,7%	4,1%	0,834$^{?}$
Robotic vacuum cleaners	5,7%	4,0%	6,5%	4,5%	4,3%	0,0%	4,9%	0,734$^{?}$
Other tools	11,4%	8,1%	6,5%	9,1%	10,6%	0,0%	8,0%	0,440

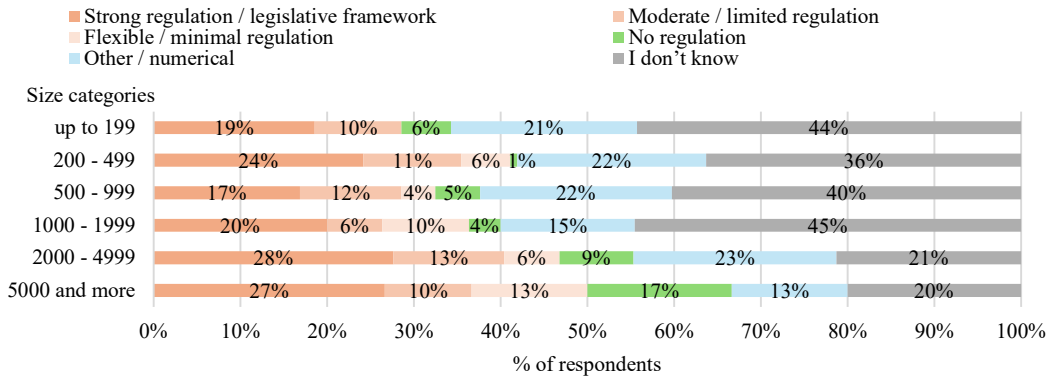
Note: [1] "*" indicates a test result ≤ 0.05. This means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "+" indicates a test result > 0.05 and ≤ 0.1. This suggests that the difference between groups is less conclusive (the result points to a possible difference, but it is not definitively confirmed). "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

4.6 Level of Regulation of AI Use in Local Government According to Size Category

We examined whether municipalities of different sizes hold differing views on the question: "To what extent should the use of AI in local government be regulated, in your opinion?" The responses indicate that larger cities are more open to flexible approaches or even the complete absence of regulation (Figure 19). Both textual and numerical responses to the question were analyzed using AI, which initially proposed four categories of AI regulation in local government, along with the categories "Don't know" and "Other/numerical." The authors of the study subsequently reviewed all responses and assigned them to categories based on human interpretation of their meaning. During this process, the original categories were partially refined into the following: strong regulation/legislative framework, moderate/limited regulation, flexible/minimal regulation, no regulation, don't know, and other/numerical. Although the chi-square test of independence indicated differences among municipal size groups, one of the test's assumptions was violated: the proportion of cells with expected counts less than 5 exceeded 20% (see Table 14). Therefore, from a strict scientific perspective, the test should be considered only indicative, and the observed differences cannot be generalized to the entire population of municipalities in Slovakia.

This finding is consistent with municipalities' perceptions of the advantages and disadvantages of new technologies, in which smaller municipalities show lower trust in the security of such technologies and, consequently, a stronger preference for stricter regulation.

Figure 18 Municipal Perspectives on the Regulation of AI Use in Local Government by Municipal Size Groups



Tab. 14 Municipal Perspectives on the Regulation of AI Use in Local Government by Municipal Size Groups

	Strong regulation / legislative framework	Moderate / limited regulation	Flexible / minimal regulation	No regulation	Other / numerical	I don't know
Up to 199	18,6%	10,0%	0,0%	5,7%	21,4%	44,3%
200 - 499	24,2%	11,3%	5,6%	0,8%	21,8%	36,3%
500 - 999	16,9%	11,7%	3,9%	5,2%	22,1%	40,3%
1000 - 1999	20,0%	6,4%	10,0%	3,6%	15,5%	44,5%
2000 - 4999	27,7%	12,8%	6,4%	8,5%	23,4%	21,3%
5000 and more	26,7%	10,0%	13,3%	16,7%	13,3%	20,0%
Total	20,9%	10,3%	5,8%	4,9%	20,2%	37,9%
Pearson chi-square test[1]	0,015?*					

Note: [1] "*" indicates a test result ≤ 0.05. This means that the difference between groups is statistically significant (i.e., the result is reliable and the difference is highly likely to exist). "?" denotes cases where the test result should be interpreted as indicative rather than definitive, as the proportion of cells with an expected value lower than 5 exceeds 20% (see, for example, Rabušic et al., 2019).

5 Conclusion

In recent years, AI development has become an important topic for the public sector, including local governments, due to its potential to improve efficiency, decision-making, and public service quality. International studies emphasize AI's role in areas such as crisis management and smart city development, while also highlighting risks related to ethics, security, and insufficient staff competencies. These findings provide context for interpreting the results of a 2025 survey conducted by the Association of Towns and Communities of Slovakia (ZMOS). The survey included 535 municipalities, representing approximately one-fifth of Slovak municipalities, predominantly small municipalities with up to 1,000 inhabitants. The questionnaires were completed mainly by mayors (70%).

The results show that municipalities' experience with AI remains limited. Nearly half of respondents reported familiarity with AI but no practical use, while 36.6% use only basic tools such as chatbots. Advanced AI solutions are used by only 1.9% of respondents, and direct AI implementation was reported by 17.9% of municipalities. Current applications are concentrated mainly in administration and communication, whereas transport, energy, and environmental management remain marginal. AI tools are primarily used for text generation and communication-related tasks, while analytical applications remain limited despite their potential. Existing practices are often experimental, with barriers including lack of knowledge, cautious attitudes, and financial constraints. The most frequently perceived benefits are improved access to information (70.1%) and time savings (62.2%), whereas the main concerns involve reduced accessibility for older populations (88.2%) and loss of personal contact (79.4%). Smaller municipalities express these concerns more frequently. The most commonly used AI tools are general-purpose information retrieval systems such as ChatGPT or Bard (62.2%) and translation tools (44.5%). More advanced applications, including intelligent transport planning, voicebots, crime prediction systems, and AI tools for analyzing citizen feedback or municipal budgets, are used only rarely. Municipalities generally support AI regulation, particularly legislative frameworks. Automation and robotization are even less widespread, with only 5.6% of municipalities reporting practical use. These technologies are associated mainly with administration, communication, and energy management. Priority areas for automation include energy and public lighting, security, administration, and transport.

The survey also reveals disparities between municipalities of different sizes. Larger municipalities demonstrate greater experience with AI tools, likely due to better access to qualified human resources and technical capacities. They also perceive the benefits of AI more positively, whereas smaller municipalities emphasize associated risks. Overall, the findings indicate the need for targeted education, training, and stronger sharing of best practices to support broader adoption of AI and automation technologies in local government practice.

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