

AI ADOPTION AND CAPABILITY GAPS IN SWISS PUBLIC ADMINISTRATION

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Artificial intelligence (AI) is widely regarded as an important technology in public administration, yet empirical evidence on the conditions that shape broader AI adoption remains limited. This paper examines digitalization, AI adoption, and implementation barriers across Swiss municipalities with populations of at least 10,000 and cantonal administrations in German-speaking Switzerland. The analysis is based on a 2025 anonymous survey, with one respondent per organization responsible for digitalization and/or AI-related initiatives. The study covers internal administrative processes and externally oriented administrative services, distinguishing between non-AI digital systems and AI-related applications. The findings suggest that digitalization is often comparatively advanced, while AI adoption remains concentrated in assistive applications and is still limited in analytical and decision-adjacent forms. Reported barriers include legal uncertainty, limited expertise, resource constraints, and fragmented responsibilities. The results indicate that broader AI adoption is driven not only by the availability of technology, but also by organizational and governance-related conditions.

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1 Introduction: AI Ambition Meets Institutional Reality

Driven by the broader digital transformation of the public sector, artificial intelligence (AI) is increasingly regarded as a key technology for improving administrative efficiency and service delivery (European Commission, 2020; 2024; Mergel et al., 2019; Vial, 2019). At the same time, public administrations operate under specific institutional conditions. Accountability, transparency requirements, and democratic legitimacy make the use of AI – especially in decision-relevant contexts – particularly sensitive with regard to explainability, legal compliance, and governance design (Bannister & Connolly, 2014; Janssen & van den Hoven, 2023; Wirtz et al., 2019; Zuiderwijk et al., 2021). AI adoption in public administration should therefore be understood not as a purely technical matter, but as an organizational and institutional process.

Although many public administrations have made substantial progress in digitalization, more advanced forms of AI use often remain limited and selectively integrated. Existing research has explored AI adoption and capabilities within public organizations, yet there remains a limited understanding of how widespread AI deployment aligns with existing levels of digitalization across administrative processes and which barriers constrain its further implementation in public administration (Mikalef et al., 2023). Against this background, this paper examines Swiss municipalities and cantonal administrations in German-speaking Switzerland¹ and focuses on two empirical dimensions: first, the degree of digitalization and AI adoption in externally oriented administrative services and internal administrative processes; second, the organizational, technical, legal, and cultural barriers constraining further implementation. AI adoption is understood as the reported organizational use and intended near-term implementation of AI-related applications. For the purpose of this study, AI encompasses applications such as text generation, chatbot-based interaction, classification, analysis, prediction, and decision-related support. By contrast, online forms, payment systems, appointment-booking systems, document management, enterprise resource planning systems, and cloud solutions are treated as elements of digitalization rather than AI applications.

¹ Switzerland's federal structure allocates administrative responsibilities across municipalities and cantons, creating heterogeneous resource capacities, legal interpretations, and coordination mechanisms that condition AI capability development.

The paper addresses the following research questions:

- RQ1: How developed are externally oriented administrative services and internal administrative processes in terms of digitalization and AI adoption in the surveyed administrations?
- RQ2: What organizational, technical, legal, and cultural barriers constrain the implementation of AI?

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature and introduces the analytical perspective. Section 3 outlines the research design and methodology. Section 4 presents the empirical results. Section 5 discusses the findings in relation to the literature. Section 6 discusses implications, limitations, and conclusions.

2 Literature Review and Theoretical Background

This paper does not treat AI adoption as the mere introduction of a new technology. Instead, it understands AI adoption in public administration as an organizational process shaped by institutional conditions and governance requirements (Janssen & van den Hoven, 2023; Mikalef et al., 2023). Established adoption frameworks such as the Technology-Organization-Environment perspective provide important reference points for studying technology adoption at the organizational level (Tornatzky & Fleischer, 1990). However, the present study does not seek to test a formal adoption model. Instead, the following review is organized around three analytical perspectives that guide the interpretation of the empirical findings. First, research on digital development in the public sector highlights the importance of established infrastructures, process integration, and the availability and quality of data (Mergel, 2019; Vial, 2019). Second, research on AI adoption points to additional requirements, including analytical expertise, coordination across units, and risk and governance management (Mikalef et al., 2023). Third, dynamic capabilities and organizational learning provide a perspective for understanding how organizations adapt structures and routines when moving from digitalization to more advanced forms of AI adoption (Argyris & Schön, 1978; Teece, 2007). Taken together, these perspectives help explain differences in digitalization, AI adoption, and implementation barriers across administrative contexts.

2.1 Digital Development in the Public Sector

Research on digital development in public administration commonly describes a shift from basic information provision to more transactional and integrated digital services (Mergel, 2019). More recent work also emphasizes interoperability, process integration, and data-driven management. In this paper, digital development refers to the degree to which administrative services and processes are digitally supported and integrated. Established systems such as enterprise resource planning or document management can improve efficiency and coordination, but they do not automatically imply more advanced forms of AI adoption or governance-related integration (Vial, 2019). Accordingly, this study treats digital development as an important empirical dimension and examines how it relates to reported patterns of AI adoption across administrative processes.

2.2 AI Adoption in Public Administration

AI adoption research highlights that the implementation of AI depends not only on technological availability, but also on organizational conditions and capabilities (Mikalef et al., 2023). AI requires high-quality data, analytical expertise, cross-departmental coordination, and institutionalized risk governance. In the public sector, AI is additionally shaped by requirements for legitimacy, transparency, and accountability (Janssen & van den Hoven, 2023). As a result, the implementation of AI in public administration is influenced not only by technical capacity, but also by legal, organizational, and governance-related conditions.

2.3 Dynamic Capabilities and Organizational Learning

Dynamic capabilities explain structural adaptation as the ability to recognize opportunities, seize them, and reconfigure organizational routines (Teece, 2007). Integrating AI into governance-relevant processes precisely requires such reconfiguring capabilities. Organizational learning approaches complement this perspective by distinguishing between incremental optimization (single-loop) and the fundamental transformation of decision-making logics (double-loop) (Argyris & Schön, 1978). Institutional frameworks can limit these profound transformations. In this paper, these approaches are used as interpretive perspectives for discussing

differences in AI adoption and implementation barriers across administrative contexts.

3 Method

This study employed a cross-sectional online survey to deliver a descriptive assessment of digitalization, AI adoption, and implementation barriers within public administration. The survey focused on both internal administrative processes and externally oriented administrative services and was conducted between September and October 2025.

3.1 Sample

The sample comprised Swiss municipalities with populations of at least 10,000 and cantonal administrations in German-speaking Switzerland. Invitations to participate in an anonymous online survey were distributed to 145 municipalities and 35 cantonal administrations. The survey was designed to elicit responses from a single representative per organization, specifically individuals responsible for digitalization and/or AI-related initiatives. In total, responses were obtained from 21 municipalities and 13 cantonal administrations. All results are reported in aggregated form to ensure anonymity. This design aimed to capture organization-level assessments from respondents with relevant knowledge of digitalization and AI-related activities. The moderate response rate, particularly at the municipal level, limits the generalizability of the findings. Accordingly, the results should be interpreted as indicative rather than representative.

3.2 Measurement and Analysis

The questionnaire consisted of four parts: general organizational information; digitalization and AI use in internal administrative processes; digitalization and AI use in externally oriented services for citizens, companies, and organizations; and perceived barriers to digitalization and AI projects. In both internal administrative processes and externally oriented services, respondents assessed the overall level of digitalization and AI use using five-point Likert scales. They also indicated the current and planned use of predefined non-AI digital systems, digital services, and AI-related applications through predefined categorical multiple-response items. For internal administrative processes, the questionnaire additionally assessed the current

level and perceived potential of digitalization across specific process categories. Implementation barriers were likewise recorded through predefined categorical multiple-response items covering organizational, technical, legal, cultural, personnel-related, and legitimacy-related constraints. The data were analyzed descriptively using frequency distributions and comparisons across administrative levels. Given the exploratory purpose of the study, no inferential statistical tests were performed. Appendix A provides a structured overview of the survey instrument, the measurement approach, and selected survey questions.

4 Digitalization, AI Adoption, and Implementation Barriers

This section presents the empirical results with respect to the two research questions. It begins by analyzing the extent of digitalization and AI adoption in externally oriented administrative services and internal administrative processes (RQ1) and subsequently examines the key barriers that constrain further implementation (RQ2).

4.1 Digitalization in Externally Oriented Administrative Services and Internal Administrative Processes (RQ1)

The reported degree of digitalization in externally oriented administrative services is predominantly medium to high at both administrative levels. Thirteen of 21 municipalities and 9 of 13 cantonal administrations place these services in the medium-to-high range, whereas lower levels are reported by 8 municipalities and 3 cantonal administrations. This pattern is consistent with the broad availability of core digital administrative services such as online forms, digital transactions, and payment functions. At the same time, more specialized or user-oriented functions are less consistently developed.

A similar but more differentiated pattern appears in internal administrative processes. Among municipalities, 12 of 21 respondents assess the degree of digitalization of internal processes as medium and 7 as high, while 3 rate it as low. Among cantonal administrations, 8 of 13 respondents report medium levels and 4 high levels, while 2 rate the degree of digitalization as low. Differences become more visible when individual process domains are considered. Infrastructure-oriented support areas such as IT and internal communication or financial management show comparatively high levels of digitalization. By contrast, leadership support, steering,

and quality-related processes remain less digitally developed. For example, 19 of 21 municipalities and 11 of 13 cantonal administrations rate leadership support and steering as low to medium, while the perceived digitalization potential of this area is high to very high in 20 of 21 municipalities and 8 of 13 cantonal administrations. A similar discrepancy is visible in quality management. Overall, the findings indicate that operational and support-oriented digitalization is more advanced than the digitalization of leadership- and governance-related internal processes.

4.2 AI Adoption in Externally Oriented Administrative Services and Internal Administrative Processes (RQ1)

Compared with digitalization, AI adoption is considerably less advanced across both externally oriented administrative services and internal administrative processes. In internal administrative processes, 16 of 21 municipalities and 12 of 13 cantonal administrations rate current AI use as very low to low, while only 1 municipality reports a high level of current use.

At the same time, the data show important differences between AI application types. Current use is concentrated in assistive forms of AI adoption. Generative AI systems are currently used by 11 of 21 municipalities and 9 of 13 cantonal administrations, while broader AI-assisted support systems are reported by 8 municipalities and 6 cantonal administrations. More advanced analytical and decision-related applications remain much less common. For example, document and information analysis is currently used by only 3 municipalities and 3 cantonal administrations, pattern or anomaly detection by 2 municipalities and 4 cantonal administrations, and decision-support tools by only 1 municipality and no cantonal administration. Process automation is not currently reported by any municipality or canton in the sample. At the same time, intended near-term implementation is substantially higher in many of these categories. Document and information analysis is planned by 12 municipalities and 8 cantonal administrations, process automation by 9 municipalities and 8 cantonal administrations, and decision support by 8 municipalities and 9 cantonal administrations. This points to a clear gap between current organizational use and expected expansion. Figure 1 illustrates that the gap between current use and planned implementation is particularly pronounced for analytical and decision-support AI applications, whereas assistive AI is already more widely used.

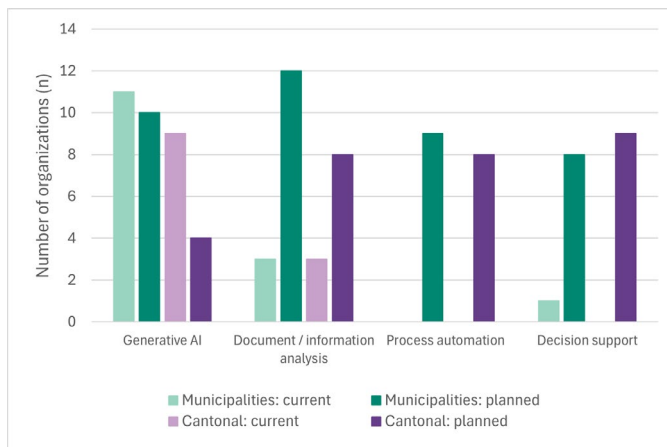


Figure 1: Current and planned AI adoption across application types in internal administrative processes by administrative level

Source: Own

A similar pattern can be observed in externally oriented administrative services. Here too, AI adoption remains limited overall: 16 of 21 municipalities and 10 of 13 cantonal administrations rate current AI use as very low to low. At the same time, selected assistive AI-related functions are already in use in a relevant minority of organizations. Chatbots or virtual assistants are reported by 10 municipalities and 8 cantonal administrations, and AI-supported form assistance or pre-checking by 10 municipalities and 5 cantonal administrations. More advanced analytical applications remain less common, for example forecasting of processing times (5 municipalities; 2 cantonal administrations), anomaly detection in entries (7 municipalities; 3 cantonal administrations), or feedback and sentiment analysis (5 municipalities; 1 cantonal administration).

Taken together, the results point to a consistent pattern across both administrative contexts. AI adoption is most visible where it supports relatively low-risk and assistive tasks, while analytically demanding or decision-adjacent applications remain rare. At the same time, the comparatively high level of intended near-term implementation in several categories indicates that many administrations see future relevance in broader AI deployment, even though current implementation remains selective.

4.3 Implementation Barriers (RQ2)

The main barriers to AI implementation are not primarily technological, but organizational, legal, and governance-related. The most frequently reported barriers include legal uncertainty regarding AI, lack of personnel and budget, fragmented responsibilities, and limited digital and AI-related skills among staff. Legal uncertainty regarding AI is reported by 18 of 21 municipalities and 6 of 13 cantonal administrations, while lack of personnel and budget is reported by 17 municipalities and 10 cantonal administrations. Fragmented responsibilities are mentioned by 14 municipalities and 8 cantonal administrations, and lack of digital skills by 16 municipalities and 8 cantonal administrations.

Some barriers show clear differences between administrative levels. Legal uncertainty and data protection requirements are especially pronounced among municipalities. Complex data protection requirements are reported by 17 of 21 municipalities, but only by 2 of 13 cantonal administrations. By contrast, legacy systems are more frequently emphasized by cantonal administrations (9 of 13) than by municipalities (8 of 21), suggesting that system integration and structural complexity are particularly relevant at the cantonal level. Other barriers, such as lack of model transparency or explainability, unclear user needs, or complex communication of AI, are present at both levels but less dominant than legal and organizational constraints.

5 Discussion: AI Adoption as a Governance-Mediated Capability Challenge

The empirical results reveal a clear discrepancy between the relatively advanced state of digitalization and the still selective use of AI in the surveyed administrations. This discussion interprets this discrepancy through the analytical perspectives introduced in Section 2. Rather than treating AI adoption as a linear extension of digitalization, it examines how existing digital infrastructures, organizational learning processes, and institutional constraints shape the development of AI-related capabilities in public administration.

5.1 An Asymmetrical Pattern of AI adoption

A first key finding is the uneven pattern of AI adoption across application types and process domains. Assistive AI applications are already used in several organizations, whereas analytical and decision-adjacent uses remain much less common despite considerable planned implementation. This pattern is reinforced by the lower level of digitalization in leadership support, steering, and quality-related processes, where AI use would require stronger data integration, governance capacity, and organizational coordination. The findings therefore point to an asymmetry between early assistive use and deeper AI integration.

5.2 Between Incremental Optimization and Broader Organizational change

A second key finding concerns the character of current AI adoption. Much of the observed use supports existing workflows rather than transforming administrative routines or decision-making structures. From the perspective of AI adoption research and organizational learning, the findings are therefore more consistent with selective, incremental adoption than with broader organizational transformation, especially where AI would need to be embedded in management, coordination, or governance-relevant processes.

5.3 Institutional Constraints on Broader AI Deployment

The reported barriers indicate that broader AI deployment is constrained less by the absence of digital tools than by legal, organizational, and governance-related conditions. Legal uncertainty, limited expertise, fragmented responsibilities, and resource constraints are more salient than purely technical obstacles. While the overall barrier profile is broadly similar across administrative levels, the relative weight of specific constraints differs. Municipalities report particularly strong legal and competence-related constraints, whereas cantonal administrations more often emphasize legacy systems and integration complexity. This suggests that the organizational adaptation required for broader AI adoption is shaped by institutional context and administrative structure.

5.4 Synthesis

Taken together, the findings suggest that the surveyed administrations have often moved beyond basic digitalization, but not yet toward structurally embedded AI adoption. The central challenge lies in translating digital infrastructures into organizational capabilities for more advanced and governance-relevant AI use. This points less to a linear stage model of AI development than to a capability gap shaped by organizational learning, institutional conditions, and governance requirements.

6 Implications, Limitations, and Conclusions

This section synthesizes the study's key findings by outlining their implications, acknowledging important limitations, and presenting the overall conclusions.

6.1 Implications and Contributions

The findings have implications for administrative practice, intergovernmental coordination, and research on AI adoption in public administration. For practice, they suggest that administrations should distinguish more clearly between digitalization and AI adoption. Established digital infrastructures may provide an important basis for AI use, but they do not automatically lead to analytically advanced or governance-relevant applications. Broader AI implementation therefore requires clearer responsibilities, stronger internal competencies, and governance arrangements that address legal certainty, data protection, transparency, and accountability.

For governance and policymaking, the results indicate that implementation strategies should be sensitive to administrative context. Municipalities appear particularly affected by legal uncertainty, resource constraints, and competence gaps, whereas cantonal administrations more often face legacy systems and integration complexity. This points to the value of shared guidance, exchange formats, and cooperative approaches to capability building across administrative levels.

This study contributes to the literature in three ways. First, it provides empirical evidence that relatively advanced digitalization does not necessarily translate into broader AI adoption in public administration. This highlights a gap between existing

digital infrastructures and the organizational conditions required for more advanced AI use. Second, it identifies a consistent adoption pattern in which AI use remains concentrated in assistive applications, while analytical and decision-adjacent applications remain limited, particularly where AI would require stronger integration into leadership, steering, and quality-related processes. Third, it shows that perspectives from AI adoption research, dynamic capabilities, and organizational learning are useful for interpreting this gap not primarily as a technological constraint, but as a capability and governance challenge shaped by organizational learning, institutional conditions, and administrative coordination.

6.2 Limitations

This study is subject to several limitations. First, it is based on a cross-sectional survey design and therefore captures digitalization, AI adoption, and implementation barriers only at a single point in time. Second, the results rely on self-reported assessments, meaning that perception bias cannot be excluded. Third, the moderate response rate and possible selection effects limit the generalizability of the findings. Fourth, the analysis is restricted to municipalities and cantonal administrations in German-speaking Switzerland. Finally, the study is descriptive in nature and does not allow causal conclusions.

6.3 Conclusions

Overall, the study shows that AI adoption in public administration cannot be understood as a simple extension of digitalization. While many surveyed administrations report comparatively advanced digitalization in operational and support-related processes, AI use remains selective and concentrated in assistive applications. More analytical and decision-adjacent forms of AI remain limited despite considerable planned implementation. The main challenge is therefore not the absence of digital infrastructure, but the capability gap between existing digital systems and the organizational, legal, and governance capacities required for broader AI deployment.

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Summary

This study examines AI capability gaps in Swiss municipalities and cantonal administrations in German-speaking Switzerland. Based on a 2025 survey of respondents responsible for digitalization and/or AI-related initiatives, it analyzes digitalization, AI adoption, and implementation barriers. The findings show comparatively advanced digitalization in several operational and support-related domains, while AI adoption remains concentrated in assistive applications and is still limited in analytical and decision-support uses despite considerable planned implementation. The main barriers are legal uncertainty, limited expertise, resource constraints, and fragmented responsibilities rather than technological availability alone. Interpreted through AI adoption research, dynamic capabilities, and organizational learning, the findings point to a capability gap between existing digital systems and the organizational, legal, and governance capacities required for broader AI adoption.

Appendix A: Survey Instrument and Measurement Approach

This appendix provides a structured overview of the survey instrument used in this study. Table A1 summarizes the main sections (A-D) of the questionnaire, the key topics covered, and the corresponding measurement approach. The following subsections describe how the main constructs were operationalized and provide selected survey questions to illustrate the items used in the analysis.

Appendix A1: Structure of the questionnaire

Table A1: Overview of survey sections and measurement approach

	Topic	Key question	Measurements
A	Organizational context	Administrative level, size, function of respondent	Predefined categorical items (single response)
B	Internal administrative processes	Overall digitalization level, AI use, process-specific digitalization, digital systems and AI applications (current and planned)	Five-point Likert scales and predefined categorical multiple-response items
C	Externally oriented administrative services	Overall digitalization level, AI use, and digital or AI-supported services for external users (current and planned)	Five-point Likert scales and predefined categorical multiple-response items
D	Implementation barriers	Organizational, technical, legal, cultural, personnel-related, and legitimacy-related barriers	Predefined categorical multiple-response items

Source: Own Elaboration

Appendix A2: Measurement of key constructs

Digitalization

Digitalization was measured as the reported degree to which administrative services and processes are digitally supported. Respondents assessed digitalization in two contexts: internal administrative processes and externally oriented administrative services.

For internal processes, respondents assessed both current digitalization and perceived digitalization potential in domains such as leadership support, quality management, process management, HR, IT and internal communication, financial management, document handling, and procurement.

Digitalization was measured using five-point Likert scales: Very low, low, medium, high, very high.

In addition, the questionnaire captured the current and planned use of non-AI digital systems, including document management systems, ERP systems, workflow tools, cloud solutions, collaboration software, BI/data warehouse systems, e-learning platforms, knowledge management platforms, and IT ticketing systems.

AI adoption

AI adoption was operationalized as reported current organizational use and intended near-term implementation of AI-related applications. The questionnaire distinguished between internal administrative processes and externally oriented services.

For internal processes, respondents indicated whether selected AI applications were currently used, planned within the next 3–5 years, or not used/not planned. Application categories included generative AI, AI-assisted support systems, document and information analysis, pattern or anomaly detection, process analysis and automation, decision support, decision automation, and real-time AI applications.

For external services, the questionnaire captured digital and AI-supported services such as citizen apps, chatbots, online transactions, online forms, AI-supported form assistance, appointment booking, processing-time forecasting, automated plausibility checks, anomaly detection, feedback analysis, translation tools, and speech recognition.

Implementation barriers

Implementation barriers were measured through predefined items. Respondents could select multiple applicable barriers. The categories covered organizational and strategic barriers, technological and data-related barriers, legal and regulatory barriers, cultural and personnel-related barriers, and user- or legitimacy-related barriers.

Measurement note

Likert scales were used to assess the degree or intensity of digitalization and AI use. Predefined categorical multiple-response items were used to capture the presence, type, and planned implementation of digital systems, AI applications, external services, and implementation barriers.

Appendix A3: Selected survey questions

Organizational context

Respondents were asked to provide information on their role/function, administrative level, municipality/city or canton, and organization size.

Internal administrative processes

How do you assess the current level of digitalization of internal administrative processes in your organization?

☐ Very low ☐ Low ☐ Medium ☐ High ☐ Very high

How do you assess the current use of AI solutions for supporting internal administrative processes in your organization?

☐ Very low ☐ Low ☐ Medium ☐ High ☐ Very high

Respondents then assessed the level of digitalization and the potential for further digitalization in selected internal process domains.

Digital systems for internal processes

Which technologies are currently used or planned for supporting internal administrative processes in your organization?

Table A2a: Current and planned use of non-AI digital systems in internal administrative processes

	Current use	Planned within 3-5 years	Not used / Not planned
A	☐	☐	☐
B	☐	☐	☐
C	☐	☐	☐
D	☐	☐	☐
E	☐	☐	☐
F	☐	☐	☐
G	☐	☐	☐
H	☐	☐	☐

Source: Own Elaboration

Legend:

A: Document management / records management; B: Collaboration software; C: Cloud solutions; D: ERP systems; E: Workflow management tools; F: Robotic process automation; G: BI / data warehouse systems; H: Knowledge management / IT support systems;

AI applications for internal processes

Which AI-based applications are currently used or planned for supporting internal administrative processes?

Table A2b: Current and planned use of AI-based applications in internal administrative services

	Current use	Planned within 3-5 years	Not used / Not planned
A	☐	☐	☐
B	☐	☐	☐
C	☐	☐	☐
D	☐	☐	☐
E	☐	☐	☐
F	☐	☐	☐
G	☐	☐	☐
H	☐	☐	☐

Source: Own Elaboration

Legend:

A: AI-assisted support systems; B: Document and information analysis; C: Pattern/anomaly detection and prediction; D: Process analysis or automation; E: Decision support or automation; F: Real-time AI applications.

Externally oriented administrative services

How do you assess the current level of digitalization in the provision of services for citizens, companies, and organizations?

☐ Very low ☐ Low ☐ Medium ☐ High ☐ Very high

How do you assess the current use of AI solutions in the provision of services for citizens, companies, and organizations?

☐ Very low ☐ Low ☐ Medium ☐ High ☐ Very high

Which digital and/or AI-supported services does your organization currently provide or plan to provide?

Examples included online forms and applications, online transactions, online payments, digital document ordering, register access, appointment booking, citizen

apps, chatbots, AI-supported form assistance, processing-time forecasting, anomaly detection, feedback analysis, translation tools, and speech recognition.

Implementation barriers

Which challenges do you experience or expect in the implementation of digitalization and AI projects in your organization?

Multiple answers were possible.

Examples included lack of personnel or budget, fragmented responsibilities, lack of strategy, lack of competencies, legacy systems, interoperability problems, data protection requirements, legal uncertainty regarding AI, resistance to change, lack of digital or AI skills, unclear user needs, low societal acceptance, and lack of participation or transparency in AI use.