

The Development of digital competences of public officials through the use of Administrative Consultation Platform in the conduct of administrative procedures in public administration in Slovenia

Špela Mar¹, Faculty of Public Administration, University of Ljubljana, Slovenia, spela.mar@fu-uni-lj.si

Nina Kristl², Faculty of Public Administration, University of Ljubljana, Slovenia, nina.kristl@fu-uni-lj.si

Jernej Buzeti³, Faculty of Public Administration, University of Ljubljana, Slovenia, jerne.j.buzeti@fu.uni-lj.si

Abstract

Public administration is an important part of modern society, as it is constantly exposed to various challenges and changes. To conduct administrative procedures, public officials must possess the appropriate competences, including digital competences. Public officials acquire and develop digital competences during their education and work, where they can also use the Administrative Consultation Platform (hereinafter referred to as ACP). This paper examines the digital competences of public officials who conduct administrative procedures in Slovenian public administration, and how these competences have developed through to the use of ACP. The research question is: Which digital competences public officials who conduct administrative procedures in public administration in Slovenia possess, and how have they evolved through the use of the ACP? The theoretical part employs the descriptive, synthetic, and comparative methods, while the empirical part uses the quantitative method. In March 2025, a survey on the digital competences of 66 Slovenian public officials who used ACP to conduct administrative procedures in 2024 was carried out. The results showed that the public officials had adequately developed the digital competences according to DigComp 2.2 before using the ACP: Information and data literacy (browsing, searching and filtering data, information and digital content, evaluating data, information and digital content, managing data, information and digital content), Communication and collaboration (interacting through digital technologies, engaging citizenship through digital technologies, netiquette), Safety (protecting devices, protecting personal data and privacy, protecting health and well-being) and Problem solving (solving technical problems, creatively using digital technology, identifying digital competence gap), while their Digital content creation (developing digital content, integrating and revising digital content, copyright and licences) was slightly less developed. The statistical analysis of the data shows that the public officials further developed and improved the above-mentioned digital competences through the use of the ACP.

Keywords: Administrative Consultation Platform, Digital competences, DigComp, Public officials, Public Administration in Slovenia

¹ Teaching assistant, Faculty of Public Administration, University of Ljubljana, Ljubljana, Slovenia

² Teaching assistant, Faculty of Public Administration, University of Ljubljana, Ljubljana, Slovenia

³ Associate professor, Faculty of Public Administration, University of Ljubljana, Ljubljana, Slovenia

1 Introduction

Public administration as a scientific discipline and professional field represents a multi- and interdisciplinary field that combines various sciences (e.g. law, political science, organisation, sociology, psychology, management, economics, informatics, ...) (Kovač & Stare, 2014) and is evolving and becoming increasingly complex due to societal changes and the implementation of reforms such as Good Governance (Guerin et al. 2021). Public officials employed in public administration institutions in Slovenia, whose work is based on the conduct of administrative procedures, must constantly adapt to changes in public administration and therefore have a wide range of knowledge, skills and personal qualities, as this is the only way they can fulfil their work tasks effectively and successfully.

Public officials handle several million administrative cases every year, which are subject to the General Administrative Procedure Act (GAPA; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 80/99 of 1 October 1999) and Decree on administrative operations. Public officials must be professionally qualified to conduct administrative procedures. They must not only fulfil the requirements of Article 31 of the GAPA, such as being employed by a competent authority, but also have adequate education, have passed a professional examination in administrative procedures, authority and impartiality (Kovač & Jerovšek, 2024) and have sufficiently developed legal competences, such as knowledge in the field of administrative law, personal data protection, etc. (Carrel, 2019), which public officials acquire and develop as part of their education in relevant accredited study programmes (Kovač & Stare, 2014) and through continuing professional development. However, with the digitalisation of administrative services and the increasing use of information and communication technology (ICT) and artificial intelligence (AI) tools, the importance of digital competences for public officials is coming to the fore (Seckelmann & Catakli, 2025, in Sommerman et al. 2025; Bilan et al. 2023; Cedefop, 2023; Rizza, 2023; INAP, 2022; van Laar et al. 2019).

When conducting administrative procedures under the GAPA and the Decree on administrative operations and other legal regulations, it can be observed that public officials also use the Administrative Consultation Platform (ACP), which is currently used by 148 public officials. ACP is a joint project of the Faculty of Public Administration (FPA UL) and the Ministry of Public administration of Slovenia (MPA), which aims to standardise the functioning of public authorities in administrative procedures and administrative operations, as set out in the GAPA and the Decree on administrative operations. Originally, the ACP was launched as a research project to solve complex problems in the practise of real administrative procedures (Kovač & Stare, 2014), but now it is an educational, research and professional project in which 1st and 2nd cycle students of the FPA UL degree programmes also participate under the guidance of mentors from the FPA UL and administrative authorities. The ACP is free of charge and is aimed at public officials who conduct administrative procedures. It enables them to share professional experiences and receive guidance in solving short, specific administrative procedure issues to understand GAPA and the Decree on administrative operations, which can be generalised and lead to a corresponding amendment of GAPA. However, in order for public officials to use ACP to conduct administrative procedures, they must have acquired and developed appropriate digital competences. Which digital competences do public officials have and to what extent have they developed or improved them in 2024 through the use of

ACP? This is the content we are investigating as part of the FPA UL project and some of the results of the research are presented in this paper.

The purpose of the paper is to examine what digital competences of public officials who conduct administrative procedures in public administration in Slovenia have and how they have developed them through the use of ACP. The aim of the paper is to present the results of a research project on how the digital competences of public officials were developed before the use of ACP and how they developed due to the use of ACP. The research question is: Which digital competences do public officials who conduct administrative procedures in public administration in Slovenia have and how have they developed these competences through the use of the ACP?

In the theoretical part of the paper, the competences (Mikhridinova et al. 2024; Schaffar, 2021; Vitello & Greatorrex, 2021; Kruyen & Van Genugten, 2020; Legault, 2020; Arzenšek et al. 2019; Schneider, 2019; Stare & Klun, 2018; Von Treur & Reynolds, 2017; Skorkova, 2016) and digital competences (Seckelmann & Catakli, 2025, v Sommerman et al. 2025; Bilan et al. 2023; Cedefop, 2023; Edelman et al. 2023; INAP, 2023; Rizza, 2023; van Laar et al. 2020; European Commision, 2019) of public officials, who conduct administrative procedures are presented. In addition, various competency models (EPSO's Competency Framework in Competency Model in Public Administration in Slovenia⁴) are briefly presented, on the basis of which the key competences of public officials are determined. The Digital Competence Framework for Citizens (DigComp 2.2) and some other digital competency models are then described⁵. In our research, we have adapted the Model DigComp 2.2 accordingly in order to analyse and determine the development of digital competences of those public officials in public administration in Slovenia who use ACP.

The empirical part of the paper presents the results of a quantitative survey of our project on digital competences, which we conducted in March 2025 with 66 public officials from the public administration in Slovenia who used ACP in 2024 to conduct of administrative procedures. The last part of the paper contains a discussion of the research results and a conclusion.

2 Digital competences of public officials in public administration

Public officials must have developed various competences in order to be able to conduct administrative procedures effectively. These include legal competences in particular, but digital competences are also becoming increasingly important. Public officials acquire digital competences during their education, and expand them during their work and also through the use of ACP.

⁴ Slov. Model kompetenc v državni upravi.

⁵ The Global Skills and Competency Framework for a Digital World (SFIA), the Digital, Data and Technology (DDaT) Capability Framework, The Model of Digital Skills by the Government Digital Academy in Denmark, Syllabus Framework in Italy, the European framework for interoperability skills and competences in the public sector (EIFISC) (OECD, 2024), The INAP digital competences framework (INAP, 2022) and the Digital Competence Framework (DCF) (UNESCO, 2022).

2.1 Competences and competency models in public administration

The literature analysed (Mikhridinova et al. 2024; Schaffar, 2021; Vitello & Greateorex, 2021; Kruiyen & Van Genugten, 2020; Legault, 2020; Arzenšek et al. 2019; Schneider, 2019; Stare & Klun, 2018; Von Treur & Reynolds, 2017; Skorkova, 2016) shows that there are numerous but similar definitions of the concept of competence. According to Skorkova (2016), the concept of competence derives from the Latin word “competentia”, which means “the right to judge” or “the right to speak”. Schaffar (2021) adds that the concept of competence is understood differently depending on the language area. In German, French and Dutch⁶, competence is used in a broader sense, while in English it is understood in a narrower sense, usually as the ability of employees. The lack of a standardised definition in Europe and English makes it difficult to study employee competences. Although, according to Schaffar (2021), even the introduction of a standardised concept could lead to problems in understanding and studying employee competences.

Competence means the ability of a person to successfully fulfil individual or social requirements or activities or tasks (OECD, 2022, v Schneider, 2019). Kruiyen in Van Genugten (2020) believe that competence is related to work and can be attributed to those skills, abilities and attitudes of workers that are essential for the successful performance of work tasks. Competence is a measurable human ability that is necessary for successful work and consists of the knowledge, skills, abilities and personal characteristics of employees (Marrelli et al. 2005, v Arzenšek et al. 2019). This means that it represents a measurable pattern of knowledge, skills, abilities, behaviours and other characteristics of employees that they need to successfully perform work tasks in the workplace (Von Treur & Reynolds, 2017). Employees improve their competences and enable them to grow personally and professionally (Legault, 2020).

In addition to the concept of competence, there is also the concept of competency⁷ (Mikhridinova et al. 2024; Schaffar, 2021; Vitello & Greateorex, 2021). Vitello in Greateorex (2021) defines competence as the ability to apply appropriate knowledge, skills and psychosocial factors (e.g. beliefs, attitudes, values and motivations) that enable employees to work successfully in a particular field and adds that in English the term »competency« is used for the concept of competence (Vitello & Greateorex, 2021). Competence refers to the broader characteristics of employees according to a certain standard, while competency in the narrower sense means a set of specific characteristics related to the task or activity of employees (Hyland, 1994, v Vitello & Greateorex, 2021). According to Stare and Klun (2018), competence encompasses the knowledge, procedures and relationships of individuals that are summarised in a goal. Competence therefore means the knowledge that a person can demonstrate, while their competency refers to the ability to perform certain tasks that enable them to be successful (Schneider, 2019; Indeed, 2025). Although both terms are used interchangeably, it is important to note the difference when using them, especially when it comes to determining the specificity of employees' competences (Vitello & Greateorex, 2021).

When defining the concept of competence, the authors (Schaffar, 2021; Vitello and Greateorex, 2021; Kruiyen and Van Genugten 2020; Arzenšek et al. 2019; Skorkova 2016) present various competency models. A competency

⁶ German: Kompetenz, French: compétence and Dutch Competentie.

⁷ Being competitive.

model is an organisational framework for defining the competences that employees need to function effectively in a particular job, within the work process and in the organisation (Mikhridinova et al. 2024). It enables the determination of competences that are attributes for job analysis and with which it is possible to determine future roles and employee performance according to the organisation's strategic plan (Stevens, 2013, in Mikhridinova et al. 2024).

In the European Union (EU), the EPSO's Competency Framework is used to analyse the key competences of EU staff. The competency model identifies eight key competences that EU staff must demonstrate throughout their careers: 1. Critical thinking, analysing & creative problem-solving, 2. Decision-making & getting results, 3. Information management (digital and data literacy), 4. Self-management, 5. Working together, 6. Learning as a skill, 7. Communication and 8. Intrapreneurship (EPSO, 2022). Each competence is composed of several detailed aspects that support the successful accomplishment of tasks in the EU institutions (EPSO, 2022).

In Slovenia, in 2019, the Public Sector Directorate created a competency model for public administration, which serves as a tool for identifying and developing competences of civil servants and helps managers and HR professionals in the implementation of HR processes such as recruitment, hiring, training and career development of employees, succession planning and the like (Arzenšek et al. 2019). The competency model for public administration consists of three central content groups: 1. core competences, 2. leadership competences and 3. job-specific competences, with competences and behavioural indicators defined and described in each group (Arzenšek et al. 2019).

Due to continuous societal change, and especially more recently due to the digitalisation and digital transformation of public administration, as well as the rapid development of ICT and the introduction of AI tools, public officials must constantly improve and develop appropriate competences (Carrel, 2019). In the provision of administrative services and the conduct of administrative procedures it is therefore essential that public officials have appropriately developed digital competences in addition to legal competences⁸ (Bedner et al. 2020; Carrel, 2019; Hamilton, 2014; Shultz & Zedeck, 2011). On this basis, we present below the digital competences of public officials and the results in this area.

2.2 Digital Competence

In general, digital competences can be understood as the abilities of individuals (i.e. citizens, employees, including students, etc.) to use ICT in a specific field of activity (Rizza, 2023). Rizza (2023) and Van Laar et al. (2020) mention some other terms besides the concept of digital competences, which are mostly used as synonyms. According to van Laar et al. (2020) there are seven key digital competences of employees: 1. Technical skills - enable employees to use and master ICT and manage digital devices, 2. Information skills - help employees to find, evaluate and organise data and information in the digital environment, 3. Communication skills - help employees to communicate and engage with colleagues, employers and society through email, social networks, forums, etc., 4. Collaboration skills - enable employees to share ideas, information and experiences and work more

⁸ Application of legal knowledge (e.g. knowledge of standards and legislation) in practise, critical thinking, communication in the official language, understanding of administrative procedures, preparation of legal documents, etc.

easily in teams through ICT and applications, 5. Critical thinking skills - help employees to evaluate and separate relevant information and present clear arguments, 6. Creativity skills - enable employees to create and share content (e.g. photos, videos) and thereby provide new ideas to improve work processes and services, 7. Problem solving skills - make it easier for employees to define problems and find suitable solutions online (van Laar et al. 2020).

The European Commission and the European Centre for the Development of Vocational Training (Cedefop) highlight the importance of digital competences for employees, which represent an area of key competences for the lifelong learning of individuals, helping employees to use digital technologies consciously, critically and responsibly in learning, working and collaborating. The European Commission (2019) and Cedefop (2023) reports identify information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), security (including digital wellbeing and cybersecurity competences), intellectual property issues, problem solving and critical thinking as key digital competences for employees.

Seckelmann in Catakli (2025, in Sommerman et al. 2025) understand digital competences as a set of skills, attitudes and knowledge that public officials must have. In addition to the ability to manage digital data, these include transformative skills related to the use of digital technology and interdisciplinary skills (e. g. the capacity to motivate oneself, problem-solving abilities, creativity in adaptability) (Seckelmann in Catakli, 2025, v Sommerman et al. 2025). Public officials have acquired or developed these digital competences, they perform their work with higher quality and are able to solve complex administrative services for citizens more easily. Above all, citizens expect public officials to act in accordance with the rule of law and to take their life situations into account when providing administrative services. However, there are differences among public officials in the development of their digital competences, with younger people having developed them more than older people (Seckelmann & Catakli, 2025, in Sommerman et al. 2025).

The level of development of the digital competences of public servants in European public administrations is constantly being measured. Edelman et al. (2023) have determined which digital competences public officials need to implement the digital transformation of public administration in Austria⁹. Public officials consider leadership skills, functional technical skills and entrepreneurial skills to be the most important competences. They also believe that organisational competences (e.g. work organisation, conduct of administrative procedures and compliance with the principles of legal regulations and data management) and legal competences (e.g. knowledge of administrative law, management of legal data, mastery of the field of data protection in accordance with the regulations - GDPR) are important for carrying out their work (Edelman et al. 2023). Among the digital competences that public officials still need to develop, Edelman et al. (2023) mention the use of digital tools, the reduction of fears of using ICT, digital skills, data analysis and the implementation of ICT.

Bilan et al. (2023) found that public officials in the Ukrainian public administration generally have well-developed digital competences. The five groups of digital competences according to DigComp 2.2, namely information and data literacy, problem solving, digital content creation, communication and collaboration, and security. The most

⁹ Digital Austria in 2050 Strategic Action Plan.

developed digital competences of public officials are security, communication and collaboration, while the largest development gap was found in digital content creation (Bilan et al. 2023). Bilan et al. (2023) cite the generally low willingness of the population as a whole to use digital services as a reason for the lack of development of digital competences.

2.3 Digital competence models for public officials in public administration

Various digital competence models have been developed to measure the development of digital competences of public officials (Sommerman et al. 2025; OECD, 2024; Cosgrove et al. 2024; INAP, 2022; UNESCO, 2022). OECD (2024) reports that various competence models have been used to examine the digital competences of public officials in the public administration of OECD countries. The central model is The Digital Competence Framework for Citizens (DigComp) on which other models are based. On this basis, we present below the updated version of DigComp 2.2, as we have used it ourselves in our research on measuring the development of digital competences of public officials in public administration in Slovenia using ACP. It is also worth mentioning that there are some other competence models for measuring or investigating digital competences of public officials, e.g. The Global Skills and Competency Framework for a Digital World (SFIA), the Digital, Data and Technology (DDaT) Capability Framework, The Model of Digital Skills by the Government Digital Academy in Denmark, Syllabus Framework in Italy, the European framework for interoperability skills and competences in the public sector (EIFISC) (OECD, 2024), The INAP digital competences framework (INAP, 2022) and the Digital Competence Framework (DCF) (UNESCO, 2022).

The Digital Competence Framework for Citizens (DigComp) or the updated version DigComp 2.2 was developed in collaboration with the European Commission and the Joint Research Centre (JRC) (OECD, 2024; Vuorikari et al. 2023). The DigComp 2.2 competence model is designed to help policy makers plan education and training initiatives for a specific target group of individuals to improve their digital competences (OECD, 2024). DigComp was developed in 2010, first published in 2013 and then updated three times, most recently in 2022 (OECD, 2024; Vuorikari et al. 2023). The latest version of DigComp 2.2. provides a standardised interpretation of digital competences. In addition to the use of knowledge, skills and attitudes that help citizens to use digital and new and emerging technologies confidently, critically and safely, it also includes the ability to use AI tools (Vuorikari et al. 2023).

In DigComp 2.2, digital competences are divided into five areas (European Commission, 2024):

1. Information and data literacy: This includes competences such as identifying information needs, searching for and retrieving digital data, information and content, evaluating the appropriateness of sources and content, and storing, managing and organizing digital data, information and content.
2. Communication and collaboration: This includes the ability to interact, communicate and collaborate using digital technologies, being aware of cultural and generational diversity, participating in society through public and private digital services, engaging in civic participation and managing digital presence, identity and reputation.
3. Digital content creation: This defines the digital content creation and editing competences to enhance and integrate information and content into the existing body of knowledge, with an understanding of the use of copyright and licenses and the ability to provide understandable instructions for a computer system.

4. Safety: Competences for the protection of devices, content, personal data and privacy in the digital environment, the protection of physical and mental health, awareness of how digital technologies contribute to social well-being and social inclusion, and awareness of the impact of the use of digital technologies can be defined here.
5. Problem solving: This defines competences such as identifying needs and problems, solving conceptual problems and problem situations in digital environments, using digital tools to innovate processes and products and the individual's ability to keep pace with digital developments.

The first three sets (1, 2 and 3) or areas of digital competences DigComp 2.2. include competences and skills that can be used in the study of any group of people or in an activity, while the last two sets (4 and 5) of the so-called transversal group of digital competences DigComp 2.2. can be defined as those people or employees who use digital technologies in their work (OECD, 2024; Vuorokari et al. 2023). All five of the above DigComp 2.2. digital skills groups are assessed at four different levels depending on the complexity of employees' work tasks, namely basic, intermediate, advanced and highly specialised levels (OECD, 2024), which in turn are divided into two sub-levels, resulting in a total of eight levels (Vuorikari et al. 2023).

3 Methods

3.1 Measures

We used a questionnaire to conduct a quantitative study on what digital public officials in public administration in Slovenia have and how they have developed them through the use of ACP. In addition to section on *Digital competences*, it also included *General (demographic) data*. In section on *Digital competences*, we measured the extent to which public officials had developed an individual digital competences before using ACP (the first 5-point Likert scale) and the extent to which they perceived ACP use had enhanced their digital competences (the second 5-point Likert scale) using 15 statements formulated on the basis of a review of the existing literature on digital competences and in accordance with DigComp 2.2.

In line with the topic of our paper, we present a more detailed structure of *Digital competences*. The latter was designed after reviewing the existing literature on digital competences (Cedefop, 2023; van Laar et al. 2020; European Commission, 2019) and based on the updated version of DigComp 2.2 (Vuokari et al. 2022), which was translated into Slovenian and published in 2022. We followed a five-sets and 21 subsets structure of digital competences defined in DigComp 2.2: 1. Information and data literacy (1.1 Browsing, searching and filtering data, 1.2 Evaluating data, information and digital content 1.3 Managing data, information and digital content), 2. Communication and collaboration (2.1 Interacting through digital technologies, 2.2 Sharing through digital technologies, 2.3 Engaging citizenship through digital technologies, 2.4 Collaborating through digital technologies, 2.5 Netiquette, 2.6 Managing digital identity), 3. Digital content creation (3.1 Developing digital content, 3.2 Integrating and revising digital content, 3.3 Copyright and licences, 3.4 Programming), 4. Safety (4.1 Protecting devices, 4.2 Protecting personal data and privacy, 4.3 Protecting health and well-being, 4.4 Protecting the environment) in 5. Problem solving (5.1 Solving technical problems, 5.2 Identifying needs and technological responses, 5.3 Creatively using digital technology, 5.4 Identifying digital competence gap).

After studying the existing literature¹⁰ and after a detailed review of the claims from the five sets and 21 subsets of digital competences according to DigComp 2.2, we selected 15 subsets (1.1, 1.2, 1.3, 2.1, 2.3, 2.5, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.3 in 5.4) of digital competences that, in our opinion, public officials should have and may have develop by ACP use. For the selected subsets of digital competences, we have created customised statements at the basic complexity level, as we felt that this adequately reflects the level of digital competences required to use the ACP. From a technical point of view, the ACP is designed as a user-friendly and practical digital portal for public officials, which does not require advanced knowledge of digital technologies, but focuses on the legal content of various cases of administrative matters in accordance with the APA and the Decree on administrative operations. In the questionnaire items 2.2, 2.4, 2.6, 3.4, 4.4 and 5.2 were omitted, as we considered these competences are not needed for the use of the ACP.

3.2 Participants and Procedure

To conduct a quantitative study, we converted the questionnaire into an online survey in the open-source web application 1KA (One Click Survey; www.1ka.si), which we used to collect data between 7 and 20 March 2025. The target population of our study was 226 public officials employed in the public administration in Slovenia who conduct administrative procedures and who contacted the ACP at least once in 2024. In order to maintain the integrity of the research process, we ensured the anonymity of the respondents' data. In our online survey 73 public officials responded to the invitation to participate in the study, of which 66 respondents answered the questions we used to measure their *digital competences*.

Table 1: Demographic characteristics of the respondents

	F	%
Gender		
Men	14	26.4%
Women	39	73,6%
Generation		
Baby Boomers (1946-1964)	9	16.7%
Generation X (1965-1980)	31	57.4%
Generation Y or Millennials (1981-1996)	12	22.2%
Generation Z (1997-2010)	2	3.7%
Education obtained		
Short-cycle tertiary education (ISCED 5) or bachelor or equivalent level of education (ISCED 6)	9	17.0%
Master or equivalent level of education (ISCED 7)	33	62.3%
Doctoral or equivalent level of education (ISCED 8)	11	20.8%
Field of Education Types		
Law	20	37.0%
Public administration	19	35.2%
Social science	11	20.4%
Natural science and technology	4	7.4%
Employment authority		
Independent state body (e.g. Information Commissioner)	1	1.9%

¹⁰Seckelmann & Catakli, 2025, v Sommerman et al. 2025; European Commission, 2024; OECD, 2024; Mikhridinova et al 2024; Bilan et al. 2023; Cedefop, 2023; Edelman et al, 2023; Vuorikari et al. 2023; INAP, 2022; Schaffar, 2021; Vitello & Greatorrex, 2021; Kruiyen & Van Genugten, 2020; Legault, 2020; van Laar et al. 2020; Arzenšek et al. 2019; European Commision, 2019; Schneider, 2019; Stare & Klun, 2018; Von Treur & Reynolds, 2017.

	F	%
Ministry (Government department)	4	7.4%
Inspectorate (at state level)	2	3.7%
Collective body of government ministers (e.g. Financial administration, European Environment Agency)	0	0.0%
Administrative unit	31	57.4%
Municipal administration	4	7.4%
Municipal inspector	5	9.3%
Social institution (npr. Centre for social work)	5	9.3%
Educational institution	1	1.9%
Public agency	1	1.9%
Position		
Public officials who conducts administrative procedures	14	26.4%
Public officials who decides in administrative procedures	14	26.4%
Head of organisational unit	9	17.0%
Head of authority	12	22.6%
Other	4	7.5%
Field of operation		
Administrative procedures - social affairs	3	5.6%
Administrative procedures – education	1	1.9%
Administrative procedures - construction and environment and agriculture	10	18.5%
Administrative procedures - tax matters	0	0.0%
Administrative procedures - internal affairs	7	13.0%
Administrative procedures – inspections	9	16.7%
Administrative procedures - personal data protection and transparency	0	0.0%
Various administrative areas	16	29.6%
Other	8	14.8%

Source: Own (2025)

The general socio-demographic questions were answered by 53 public officials. Among them, 39 were women (73.6%) and 14 (26.4%) were men. The majority of respondents belonged to Generation X - 31 (57.4%), followed by Generation Y/Millennials (12 (22.2%) and Baby Boomers (1946–1964) - 9 (16.7%). Only 2 (3.7%) of respondents belonged to Generation Z (1997–2010). Most (33 or 62.3%) of the respondents had a Master or equivalent level of education (ISCED 7), 11 (20.8%) respondents had a Doctoral or equivalent level of education (ISCED 8) and 9 (17%) Short-cycle tertiary education (ISCED 5) or Bachelor or equivalent level of education (ISCED 6). In addition, 20 (37%) of respondents had a degree in law, 19 (35.2%) in public administration, 11 (20.4%) in other social sciences and 4 (7.4%) in natural science and technology.

31 (57.4%) respondents work in administrative units, 5 (9.3%) in social institutions and as municipal inspectors, po 4 (7.4%) in municipal administration and ministries with government department, 2 (3.7%) in state inspectorates and 1 (1.9%) in an independent state body, an educational institution and in public agency. 14 respondents (26.4%) work as public officials who conduct administrative procedures and as the same number as public officials who, decides in administrative procedures, 12 (22.6%) are heads of authority, 9 (17.0%) are leaders and 4 (7.5%) have other positions. Regarding the field of operation, most of them (16 or 29.6%) cover different administrative areas, 10 (18.5%) work in the field of construction, environment and agriculture, 9 (16.7%) in the field of inspection, 7 (13.0%) in the field of internal affairs and 8 (14.8%) have chosen another field. 3 people (5.6%) work in the field of social affairs, 1 person (1.9%) in the field of education and no one works in the field of taxation, personal data protection and transparency.

4 Research results

We present the results of a survey on the digital competences of public officials in public administration in Slovenia, focusing on their self-assessed competences prior to using the ACP and how these competences developed through its use. The results are presented in five separate tables for each set (1. Information and data literacy, 2. Communication and collaboration, 3. Digital content creation, 4. Safety and 5. Problem solving) of digital competences according to DigComp 2.2, where each set was measured with three items.

4.1 Information and data literacy

Table 2 shows which digital competences within digital information literacy and data literacy the surveyed public officials had developed before using ACP and how the digital competences developed through the use of ACP.

Table 2: Descriptive statistics for digital competences of public officials from the perspective of information and data literacy

		data literacy		Valid %				
		f	M	none	little	moderate	much	completely
Browsing, searching and filtering data.	before use	66	3.73	0.0%	3.0%	33.3%	51.5%	12.1%
	due to use	66	3.94	1.5%	6.1%	10.6%	60.6%	21.2%
Evaluate whether data sources, information and digital content are reliable and authentic.	before use	66	3.62	0.0%	6.1%	37.9%	43.9%	12.1%
	due to use	66	3.95	1.5%	6.1%	12.1%	56.1%	24.2%
Store data, information and digital content in digital environments.	before use	66	3.59	1.5%	6.1%	37.9%	40.9%	13.6%
	due to use	66	3.77	1.5%	9.1%	19.7%	50.0%	19.7%

Source: Own (2025)

The results show that the surveyed public officials were mostly able to search for data, information and digital content ($M = 3.73$). Almost two-thirds (63.6%) of respondents had already largely, if not completely, developed this digital literacy before using ACP. The proportion of respondents for whom the use of ACP had a high or even complete impact on the development of digital competence in searching for data, information and digital content was 81.8%. This means that for four out of five public officials, the use of ACP had a significant positive impact on the development of this digital competence. Before starting to use ACP, respondents were slightly less able to assess the reliability and credibility of sources of data, information and digital content ($M = 3.62$). However, a good half (56%) of them had already largely or completely developed this digital competence before using ACP. Due to using ACP, 80.3% of respondents (i.e. four out of five public officials) improved their ability to critically evaluate sources ($M = 3.95$). In comparison, before using ACP, respondents had a slightly lower level of digital literacy in relation to storing data, information and digital content in digital environments ($M = 3.59$). However, the majority of them (54.5%) rated this digital competence as largely or completely acquired. The proportion of respondents who have improved the storage of data, information and digital content in digital environments due to using ACP increased to 69.7%, which indicates a positive effect of the use of ACP. However, the improvement in this digital competence ($M = 3.77$) public officials than in the other two digital competences in this set.

4.2 Communication and collaboration

Table 3 presents which digital competences within the digital competence of communication and collaboration were developed by the surveyed public officials before using ACP and how they developed them due to use of ACP.

Table 3: Descriptive statistics for digital competences of public officials from the perspective of communication and collaboration

		f	M	Valid %				
				none	little	moderate	much	completely
Use simple digital technologies to interact with colleagues and service users.	before use	66	3.76	3.0%	3.0%	30.3%	42.4%	21.2%
	due to use	66	3.88	4.5%	6.1%	16.7%	42.4%	30.3%
Use digital services (e.g. e-government) that enable participation in society.	before use	65	3.69	1.5%	9.2%	29.2%	38.5%	21.5%
	due to use	65	3.77	3.1%	9.2%	20.0%	43.1%	24.6%
Apply rules of netiquette.	before use	66	3.85	0.0%	4.5%	27.3%	47.0%	21.2%
	due to use	66	3.89	1.5%	4.5%	19.7%	51.5%	22.7%

Source: Own (2025)

More than half (68.2%) of the surveyed public officials had the most developed competence in the application of netiquette rules in relation to communication and collaboration before using ACP ($M = 3.85$). The use of ACP improved the development of the application of netiquette rules in 74.2% of respondents. Almost two thirds (63.6%) were already able to use simple digital technologies extensively or completely before using ACP ($M = 3.76$). 72.7% of respondents estimated that their competence in using simple digital technologies to interact with colleagues and service users had at least largely, if not completely, improved due to the use of the ACP ($M = 3.88$). It is also striking that the respondents had well-developed digital competence in the use of digital services that enable participation in society before using ACP ($M = 3.69$), as 60% of them rated this digital competence as largely or completely acquired. After using ACP, the proportion of surveyed public officials who further developed the use of digital services for participation in society increased to 67.7%.

4.3 Digital content creation

The results in Table 4 shows that the surveyed public officials demonstrated a slightly lower level of expertise in digital content creation.

Table 4: Descriptive statistics for digital competences of public officials from the perspective of digital content creation

		creation		Valid %				
		f	M	none	little	moderate	much	completely
Create digital content.	before use	66	3.00	4.5%	24.2%	42.4%	24.2%	4.5%
	due to use	66	3.23	4.5%	18.2%	34.8%	34.8%	7.6%
Improve digital content	before use	66	3.05	4.5%	19.7%	47.0%	24.2%	4.5%
	due to use	66	3.27	4.5%	15.2%	36.4%	36.4%	7.6%
Follow basic rules on copyright and licences for digital content.	before use	63	3.40	1.6%	11.1%	44.4%	31.7%	11.1%
	due to use	63	3.59	1.6%	6.3%	36.5%	42.9%	12.7%

Source: Own (2025)

A good quarter of the surveyed public officials (28.8%) assessed their digital competence for creating digital content as largely or completely acquired. The same share of the respondents assessed that they have developed this digital competence to a lesser extent or not at all. However, the use of ACP improved the development of digital content creation ($M = 3.23$), and the proportion of respondents who rated the above-mentioned digital competence as largely or completely acquired (42.4%) also increased significantly. The situation is similar with the development of digital competence for improving digital content. The proportion of those who rated their digital content improvement competence as largely or completely developed before using ACP (28.8%) increased to just under half (43.9%) after using ACP. Respondents already had a slightly higher level of competence in the basic rules of copyright and licences for digital content before using ACP ($M = 3.40$). Almost half (42.8%) of them rated their competence as largely or completely acquired, while 11.1% felt that they had only mastered them to a limited extent before using ACP. Through the use of ACP, there was a noticeable improvement in the competence to comply with basic rules related to copyright and licences for digital content improved ($M = 3.59$), as more than half (55.6%) of the surveyed developed this digital competence largely or completely with the use of ACP.

4.4 Safety

Table 5 summarizes which digital competences related to safety public officials had before using ACP and how they have developed them due to use of ACP.

Table 5: Descriptive statistics for digital competences of public officials from a safety

		f	M	Valid %				
				none	little	moderate	much	completely
Recognise risks and dangers in digital environments,	before use	63	3.32	1.6%	11.1%	54.0%	20.6%	12.7%
	due to use	63	3.46	1.6%	9.5%	42.9%	33.3%	12.7%
Protect personal data when you share it in digital environments.	before use	63	3.57	0.0%	12.7%	33.3%	38.1%	15.9%
	due to use	63	3.76	1.6%	4.8%	31.7%	39.7%	22.2%
Protect your digital identity.	before use	63	3.46	0.0%	12.7%	42.9%	30.2%	14.3%
	due to use	63	3.67	1.6%	6.3%	36.5%	34.9%	20.6%

Source: Own (2025)

The surveyed public officials had a relatively high level of competence in recognising risks and dangers in digital environments before using ACP ($M = 3.32$). More than half (54.0%) of the respondents assessed this digital competence as moderately developed before using ACP, and a third believed that they had developed it to a large extent or completely. With the use of ACP, respondents' digital competence in recognising risks and dangers in digital environments improved ($M = 3.46$). Almost half (46.0%) of the respondents perceived a positive influence of the using of ACP on this digital competence. In terms of protecting personal data and sharing it in digital environments, respondents showed a relatively high level of competence already before using ACP ($M = 3.57$), as 54.0% assessed their digital competence as largely or completely acquired. For most respondents, the use of ACP had a positive impact on the further development of this digital competence ($M = 3.76$), as three out of five public officials demonstrated a strong improvement in this digital competence as a result of using ACP. Similarly, respondents already had a well-developed digital competence to protect their digital identity before using ACP ($M = 3.46$), as almost half (44.5%) rated this competence as largely or completely adopted. After using ACP, the development of this digital competence is evident in just over half of the public officials (55.6%).

4.5 Problem solving

Table 6 presents which digital competences in problem solving were developed by the surveyed public officials before use and how they developed them due to use of ACP.

Table 6: Descriptive statistics for digital competences of public officials from a problem solving perspective

		f	M	Valid %				
				None	little	moderate	much	completely
Identify technological problems in digital environments.	before use	63	3.21	0.0%	20.6%	46.0%	25.4%	7.9%
	due to use	63	3.35	1.6%	17.5%	36.5%	33.3%	11.1%
Use digital tools to learn or improve workflows.	before use	63	3.44	0.0%	14.3%	41.3%	30.2%	14.3%
	due to use	63	3.57	1.6%	7.9%	38.1%	36.5%	15.9%
Identify opportunities to improve digital competences.	before use	63	3.25	0.0%	20.6%	42.9%	27.0%	9.5%
	due to use	63	3.44	1.6%	12.7%	38.1%	34.9%	12.7%

Source: Own (2025)

Almost half (46.0%) of the surveyed public officials recognising the digital competence of identify technical problems in digital environments ($M = 3.21$) as moderately developed, while a third assessed they are largely or completely competent in recognising technical problems in digital environments. With the use of ACP, the proportion of the latter increased to 44.4%. When using digital tools to learn or improve work processes, the respondents showed a relatively good level of competence already before using ACP ($M = 3.44$), as almost half (44.5%) rated their competence as largely or completely acquired. For more than half (52.4%) of respondents, the use of ACP led to a moderate or strong improvement in digital competence in the use of digital tools for learning or to improve work processes. A good third of respondents (36.5%) rated the recognition of opportunities to improve digital competence as largely or fully acquired before using ACP. For just under half of the surveyed public officials (47.6%), the use of ACP contributed significantly to improving this digital competence.

5 Discussion

Based on the reviewed research (European Commission, 2024; Mikhridinova et al. 2024; Bilan et al. 2023; Vuorikari et al. 2023; van Laar et al. 2020), we conclude that public officials in modern public administration need to have developed various competences. Thus, appropriately developed competences for public officials in the prevailing doctrine of Good governance, which according to Kovač (2014) is based on the coordination of interests and the regulation of relations between different organisations, individuals and other actors in society with the aim of realising the (most) recognised values and common interests, contribute to better work performance, especially in the provision of administrative services and the conduct of administrative procedures. In addition to the legal competences of public officials, their digital competences are also important (Espada Mallorquín & Lillo, 2024; Guerin et al. 2021; van Laar et al. 2020). According to some authors (Seckelmann & Catakli, 2025, in Sommerman et al. 2025), public officials with appropriately developed digital competences do not carry out their work with higher quality, but solve complex administrative tasks for citizens more easily and efficiently.

Research question is: »Which digital competences do public officials who conduct administrative procedures in public administration in Slovenia have and how have they developed these competences through the use of the ACP?«. As part of the research on the digital competences of public officials using ACP, our analysis revealed

significant improvements across all five DigComp 2.2. or 15 selected digital competences examined in the study. The most notable improvement was observed when comparing the period before and after the use of ACP in those digital competences that the surveyed officers had developed to a lesser extent prior to using ACP. In the context of *Information and data literacy*, the surveyed public officials demonstrated relatively highly developed competence in searching for data and information before using ACP. However, the use of ACP increased the proportion of those who had largely or completely mastered this competence to 81.8%. The greatest improvement is seen in the digital competence of evaluating data, information and digital content sources and their reliability and credibility, where the proportion of public officials who have largely or fully mastered this competence has increased from 56% to 80.3%. This shows that the ACP can be seen as an effective tool for promoting critical information literacy. However, no such differences in the level of development were found in the digital competence of storing data and information and digital content in a digital environment (from 3.62 to 3.95), which could indicate the need for additional training in this area. For this reason, it would make sense to equip the ACP in future with technical functions and AI tools (e.g. virtual assistants) that would make it easier for public officials to search for and obtain the information they need in the ACP data when conduct of administrative procedures.

Regarding *Communication and collaboration*, the surveyed public officials already had relatively well-developed digital competences before using ACP, particularly in the use of netiquette ($M = 3.85$) and in the use of simple digital technologies for interacting with colleagues and service users ($M = 3.76$). Also in the use of digital services that enable participation in society ($M = 3.77$). Nevertheless, we noticed that the use of ACP has additionally contributed to the improvement of these digital competences, as the proportion of respondents who are largely or completely proficient in netiquette has increased to 74.2%. In line with the results of our survey, we conclude that public officials have further enhanced competences in this area through the use of ACP. In order for public officials to further improve their digital competence of communication and collaboration, it would be useful to organise various events for them (e.g. in the form of digital discussions and case handling with ACP).

In the the context of *Digital content creation*, compared to the four other sets of digital competences according to DigComp 2.2, it was found that these digital competences were developed to a lesser extent among the surveyed public officials before using the ACP. In particular, 28.8% of respondents had developed digital competences in the creation and improvement of digital content to a lesser extent, but they improved with the use of the ACP. Although the respondents had a well-developed digital competence in complying with basic rules in the areas of copyright and licencing of digital content, they were able to further improve this competence through the use of the ACP (from 3.4 to 3.59). Based on the above, we believe that in addition to the legal content of managing administrative procedures under the GAPA, the ACP is also an effective online tool for developing the digital creativity of public officials. As the digital content creation competence was perceived as less developed by the surveyed public officials, we believe that it would be useful to improve the ACP. For public officials, the ACP would be complemented by document templates and automated tools for designing document content (e.g. drafting decisions, structuring communications to clients) as well as guidelines for the correct citation of cases in the ACP and the use of licences and copyrights.

The results in section 4 *Safety* showed that the surveyed public officials demonstrated a relatively high level of digital competence, i.e. digital security, before using the ACP. It was found that just over half (54%) of respondents had greatly or largely developed level of digital competence, i.e. the ability to recognise risks and threats in the digital environment. With regard to the protection or security of personal data in the digital environment, the ACP was found to have an even more positive impact, as the average score increased from 3.57 to 3.76. We therefore conclude that the ACP has a significant impact on improving the development and awareness of digital security and digital identity protection of public officials. In order to strengthen the digital security competence of public officials, it would be worth considering including additional guidance in the form of warnings and guidelines for the processing and protection of personal data in the ACP.

In Section 5 *Problem solving*, the data analysis showed that the surveyed public officials exhibited a higher level of competence as a result of using ACP. Of particular note is the improvement in the development of competences in identifying technological problems in the digital environment. Before the use of ACP, 36.4% of respondents had this digital competence; after the using of ACP, the proportion increased to 50%. This means that ACP contributes significantly to digital problem solving, which also improves the knowledge of public officials in the general work process. We believe that ACP has great potential as a learning and counselling tool to help public officials develop their digital problem solving competence. Therefore, to improve ACP, we would complement it with AI tools that promote independent search for solutions (e.g. by introducing a virtual assistant).

The results of our research are in line with the findings of Cedefop (2023) and the Statistical Office of the Republic of Slovenia (SURS, 2023). On average, 27.1% of the population in the EU has developed digital competences at a basic level, which is higher than the average in Slovenia, where 23.7% of the population has sufficiently developed digital competences (Cedefop, 2023). The most developed digital competences are among the residents of Finland (61%) and the Netherlands (60.9%), while the residents of Bulgaria (11.2%) and Romania (11.8%) have the least developed digital skills, followed by the residents of Slovenia in third place (Cedefop, 2023). In 2023, the development of digital competences of Slovenian citizens was also analysed in more detail by SURS and it was found that the residents of Slovenia have the most developed digital competences in the areas of communication and collaboration (87%) and information and data literacy (86%) (SURS, 2023). The latter was also evident among the public officials surveyed in our study, as 81.8% of them confirmed that their information and data literacy has increased through the use of ACP, and 77.6% confirmed that they have improved their communication and collaboration through the use of ACP. While 62% of the Slovenian population have developed the digital competence to create digital content (SURS, 2023), 27.9% of the surveyed public officials have developed digital competence due to the use of ACP. The results are similar for the development of the digital competence of safety. The latter competence is namely developed by a good half of the Slovenian population (56%) (SURS, 2023) and 55.5% of the surveyed public officials who use ACP. Although 80% of the population in Slovenia have developed the digital competence of problem solving (SURS, 2023), only 34.9% of the surveyed public officials have developed this digital competence through the use of ACP.

In accordance with the research question »Which digital competences do public officials who conduct administrative procedures in public administration in Slovenia have and how have they developed these

competences through the use of the ACP?« we determine that public officials in public administrations in Slovenia have developed sufficient digital competences for the conduct of administrative procedures. Based on the research conducted, we conclude that the surveyed public officials in the Slovenian public administration have developed exactly those digital competences that van Laar (2020) lists as key in use ICT for performing work, such as communication and collaboration in problem solving. The mentioned digital competences of public officials refer to the conscious, critical and responsible use of digital technologies in the conduct of administrative procedures. In our opinion, the use of ACP enables the development or improvement of those digital competences (e.g. information literacy, communication and collaboration, and problem solving) that public officials urgently need in the conduct of administrative procedures. As a result, public officials also improve and expand their legal knowledge and interact more easily with colleagues, service users and other stakeholders (Cedefop, 2023; European Commission, 2019). However, the digital competences of public officials can only be used in the conduct of administrative procedures if they have been acquired as part of an appropriate development of legal competences, such as knowledge of administrative law, management of legal data and mastery of the field of data protection in accordance with the provisions of the GDPR. For all these reasons, we believe that ACP is an excellent meeting point for the development of digital and legal competences of public officials.

6 Conclusion

Public administration, with its interdisciplinary approach and based on the implementation of Good governance reform, represents an important area of society (Kovač, 2024; Kovač & Bileišis, 2017; Kovač, 2014). In order to recognise and solve complex societal problems and conduct of administrative procedures, it is crucial that public officials have adequately acquired and developed various competences, among which legal competences are at the forefront (Kovač et al. 2023; Babšek & Kovač, 2023, van Laar et al. 2020; Kovač & Stare, 2014). Public officials can develop the latter by using ACP, which enables the exchange of professional experience and advice in solving shorter, specific questions about administrative procedures in order to understand GAPA and the Decree on administrative operations. However, with the digitalisation and digital transformation of public administration and the use of ICT and AI, digital competences are also at the forefront, which public officials develop to an appropriate level in order to be able to perform their work normally and smoothly in a digital society. The results of our research show that the respondents have well-developed digital competences and that the ACP is an effective tool with which the surveyed public officials have developed these competences.

There were some limitations in conducting our research. The first limitation is the sample size, because out of the 226 public officials who asked at least one question on ACP in 2024, 66 public officials participated in our research. Due to the small sample size, the results of the research analysis cannot be generalized to the entire population of public officials. For this reason, we believe it would be useful to repeat the study in the future and then compare the results. The second limitation of our study is the use of an adapted version of DigComp 2.2 in our questionnaire. In our survey questionnaire, we adapted the statements from DigComp 2.2 according to the design of the ACP from the perspective of the public officials' user experience at the basic level, but we did not measure other levels of development of the public officials' individual digital competences. The third limitation is that we could not make any statements about the use of AI tools in our questionnaire, as the ACP does not currently

use such technology. Therefore, we propose and plan to further improve the ACP from a technical perspective by introducing some AI tools to help public officials improve their digital competences.

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