Article

Competences That Foster Digital Transformation of Public Administrations: An Austrian Case Study

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Abstract: Digitalisation has changed society, and, as a result, public administrations are required to undergo significant changes to satisfy emergent societal needs. These changes impact all areas of the public sector, including the development and provision of digital services, the design of processes, and the development of policy. To implement the digital strategies and transformation requirements, public administrations must rethink the competences that their workforce as well as the external stakeholders may need. To understand how one nation implements its digital strategy and upskills its civil servants, we conducted a qualitative analysis of 41 Austrian expert interviews. The research shows that different stakeholders require a variety of competences to participate in the digital transformation of its processes and services. The results demonstrate the high level of diversity and the need for a holistic approach to tackle the complexity of the digital public sector, where leadership plays the most important role. In addition, the study shows that the use of competence frameworks for measurement and monitoring needs to be adapted to the local context.

Keywords: digital transformation; competences; public administrations; qualitative research; Austria

1. Introduction

When public administrations digitalise processes and define new tasks, civil servants will require digital competences to serve the public more efficiently and effectively (Lember 2017). Yet many digitalisation initiatives fail to produce the anticipated results regardless of changes in policy and governance (Saleh and Awny 2020). Rupp (2017), for example, has argued that this may be due to a lack of digital literacy and competences of internal and external stakeholders. The digital transformation of public administration requires the development of a range of competences as they play "*a key role in public administration education preparing future civil servants for this modernization of the administration*" (Kausch-Zongo and Schenk 2022, p. 56). In their work on digital competences, Kausch-Zongo and Schenk (2022) focused on current public administration students and analysed their technical, social, informational, and epistemological competences. Their findings suggest that whereas technical competences emerge mostly from on-the-job training, epistemological competences, that is, the knowledge necessary for using digital tools for a definite domain or task, are underdeveloped and need more attention and training. They emphasise the need to understand the competences public sector organisations require and urge for an increased dialog between educational institutions and the public sector for improving educational programs. Identifying the necessary competences is important, but transforming public sector organisations' activities requires the involvement of stakeholders (Kaur and Lodhia 2019). In addition, as competences are central to achieving digital transformation, a lack of competences can also represent a barrier (Edelmann 2021; Steen et al. 2018).

In this article, we present the results of a case study that investigates the competences different stakeholders need to support the digital transformation of public administrations. The study focuses on Austrian public administrations, as the Austrian government's digital

strategy prescribes digitalisation of all sectors of the country and highlights the role of public administrations to achieve this (Bundeskanzleramt and BMWFW 2016; Bundesministerium für Finanzen 2022). In 2021, Austria won two awards at the European Public Sector Awards (EPSA) in the category "digital" (EIPA 2021), and it ranks 10th in recent DESI reports (European Commission 2022). At the same time, the DESI report describes Austria as having a slow uptake in the use of digital services, connectivity, and integration of digital technology (European Commission 2022). Kaur and Lodhia (2019) called for new insights into the necessary key success factors and challenges, and they pointed out that the participants' perspectives and their experiences must be explored and analysed.

To understand how the Austrian government is implementing its digital transformation strategy, 41 experts from the Austrian public administration were interviewed in order to answer the following research question: what competences do the different internal and external stakeholders need for digital transformation of public administrations? Whilst digital aspects such as promoting the use of digital tools within public administrations, the implementation of e-payment systems, digital signatures, and digital delivery of services, and the limitations and risks (cybersecurity) associated with using them also play a role, the experts highlighted that the successful digitalisation of public administrations requires the development of leadership, managerial, and social competences within the organisations. Digital transformation also requires developing new ways of working within public administrations, with other organisations and their users. Thus, the experts interviewed also pointed out that other stakeholders must develop competences associated with the use of digital tools, engagement, collaboration, and citizen participation. The lack of such competences represents a key barrier to the successful digital transformation of public administrations.

Following this introduction, Section 2 provides an overview of the literature on competences necessary for digital transformation in the public sector as well as available competence frameworks for implementing digital strategies. In Section 3, we describe the research design, the methodology, and the case selected for analysis. The analysis of the collected data is presented in Section 4 and then discussed in Section 5. This paper concludes with Section 6, where we point to future work to be carried out in this area and discuss some of the limitations of the study and how we mitigated them.

2. Literature Review: Digital Competences

The term 'competency' has two main meanings, one referring to the outputs or results of training, and the other referring to the inputs, or underlying attributes, required of a person to achieve competent performance (Hoffmann 1999). Hartig et al. (2008) defined a competence as a "*complex ability*", "*closely related to performance in real-life situations*" (p. v), and the outcome of an educational process. Ruben (2019) pointed out that competences require both knowledge and skill, where knowledge refers to understanding a concept and skill to the success in applying the knowledge. They added that the relationship between knowledge (or understanding) and skill (or the capacity for behavioural enactment) in any competency area can be either mutually enhancing/enriching or, in some instances, mutually dampening/diminishing. Kausch-Zongo and Schenk (2022) were more specific and defined competences as "*theoretical and practical knowledge, skills and values that can be readily called upon and put into action in a situation and context that is different from prior situations*" and "*grows with frequency and use*" (p. 56).

Digital competences specifically "*refer to the technological, cognitive and social knowledge, skills, and attitudes in order to apply ICT for investigating and solving problems and developing further knowledge*" (Hofmann and Ogonek 2018, p. 127). Public administrations at different governance levels need to assess and understand the digital competences their employees need. At the supranational level, for example, the European Commission (Directorate-General for Informatics 2018) has highlighted that the competences include changing mindsets, ways of working, and leadership: "*Creating a digitally transformed and data-driven Commission requires, inter-alia, changing the mindsets of staff and their working methods. This*

represents a major cultural change overseen by DG HR that will be achieved by equipping all staff (both IT professionals and non-IT staff) with the right skills through training, coaching, knowledge sharing, etc. [. . .] The leadership role of management is also critical to the success of this transformation challenge. Managers must have the right skills to be able to digitalise processes with new technologies, manage information as an asset, and introduce new working practices and oversee the change management associated with this transformation" (p. 29).

At a national level, governments such as the Ministry of Justice and Public Administration of the Republic of Republic of Croatia (2018) are working together with the National School for Public Administration, with the aim to introduce a competency framework for public administration employees. This framework is viewed as an important step toward the professionalisation of public administration. The competency framework details the conditions for the development of occupational standards in public administration and the preconditions for new qualification standards, as well as defining the training programmes, new knowledge, and skills public administration employees need.

Krpálek et al. (2021) conducted a study in the domain of professional development of staff in the public sector in the Czech Republic. Some of the core findings suggest that the combination of soft skills and skills from the domain of Industry 4.0 are also forming the future set of competences necessary for dealing with digital transformation in the public sector. The study reported on the strong demand for competences such as teamwork, internal and external communication, and self-management.

Also in high demand are strategic competences, including leadership and project management. Ruben (2019) argued that effective leadership itself is based on five broad competence areas: (1) analytic competencies; (2) personal competencies; (3) communication competencies; (4) organisational competencies; and (5) positional competencies. Armenia et al. (2021) reported the need for new management roles within the Italian public administration, such as digital transition managers. This role focuses on operational aspects of the digital transformation, including its coordination and relationship management with citizens regarding the development of e-government services.

The transformation of the public sector organisations' processes and services, and digital transformation in particular, clearly requires "*a comprehensive organizational approach rather than one that merely makes forms available online or the transition from analog to digital public service delivery*" (Mergel et al. 2019, p. 10). Hofmann and Ogonek (2018) identified four main competence areas public sector organisations need, i.e., technical, cognitive, social, and impact awareness. The technical competences include "*the selection of suitable IT and its flexible handling*" (p. 129), and the authors found that this competence should also include the willingness to engage with new technologies. They added that missing this competence is associated with fear of change and results in the late adoption of technology in public administrations. The cognitive competence is described as "*access to, organisation and evaluation of the information*" (p. 129, ibid.). Social competences are related to "*dealing with IT in an ethical and confident manner as well as making use of the collaborative forms of interaction enabled by IT*" (p. 129) as well as being able to address the challenges associated with the digitalisation of processes, documents, and services. The last area focuses on impact awareness, understood as "*the ability to evaluate the impact of digitalisation on processes and activities outside of the digital world*" (p. 129), which is seen as fundamental for developing an organisational culture that supports digital transformation.

Broomfield and Reutter (2021) reported that the three most important challenges in considering competences within the public sector are the provision of skills in the context of the changes in organisational culture, privacy and security-related concerns, and barriers regarding legal and regulatory frameworks. Koddebusch et al. (2022) analysed the competences governments currently require. They structured their findings into five main competence categories: technical, socio-technical, organisational, managerial, and political-administrative competences. The authors reported that within the first category of technical competences, the need for Information Technology (IT) skills remained high and continues to increase, and, at the same time, the need for design competences for

Information Systems (IS) has rapidly grown. The participants involved in this study stated that in both areas the labour market does not provide personnel with the necessary competences to fill the available positions. In the second category, the need for socio-technical competences focused on e-government impact, adoption, and associated politics has increased, and yet the availability of trained personnel remains low as well. The third category, organisational competences, which includes expertise in organisational design, e-government structures, and process management, has increased significantly, and here available training opportunities do not reach expectations. The need for the fourth category of competences, which includes public management, project management, and change management competences, has increased, although the demand for financial and performance management has not risen significantly. Lastly, the fifth category, that is, the need for competences in e-policy, administrative workflows, and legal aspects, has risen, and an increasing number of administrative staff are being trained accordingly (Koddebusch et al. 2022). These findings are also replicated in the systematic literature review conducted by Distel et al. (2019), who summarise that *"besides functional competences, a focus on so-called soft skills and personality traits"* is needed to successfully manoeuvre the digital transformation of public administrations.

Previous literature has mainly emphasised the need for identifying and developing the functional IT skills rather than broader and more comprehensive digital competences. Most previous studies and competence frameworks have focused on one group of stakeholders only. The research aim of this study is therefore to empirically identify the competences internal and external stakeholders need for the digital transformation of public administrations. As there is still no competence framework for identifying and categorising the competences according to the relevant stakeholders within and outside public administrations, we draw on the classification by Koddebusch et al. (2022) that represents the most current assessment of competences in public administrations and e-government. This classification is used to answer the following research questions:

What competences must the internal workforce develop to enable the digital transformation of public administrations?

What competences do external stakeholders need in order to use the services offered by a digitalised public administration?

3. Research Design

Across multiple societal sectors, demand is growing to measure individual and group competencies (Marrelli 1998). Competency measurement focuses on real-world tasks and involves a multitude of abilities. Shavelson (2010) argued that a competency *"is hypothetical and cannot be observed directly. It can only be inferred from a person's behavior"* (p.42). Using a qualitative approach allows one to analyse and explain competences as a real-life phenomenon (Bloomberg and Volpe 2018).

Shavelson (2010) noted that the use of synthetic and quantitative scores cannot ensure that the construct is measured reliably, and so questioned their validity. Therefore, for this study, the data were collected by interviewing experts and asking them to describe their real-life experiences rather than using synthetic exercises or synthetic task environments (Salas et al. 2008), as the experiences of individuals and the contexts of actions play an important role (Darke and Shanks 2002).

The case study method is particularly suitable as it allows us to gain a holistic picture of how organisations function and work (Yin 2009). The narrative interpretative approach was chosen for the analysis of the data collected to identify patterns, similarities, and differences in the experiences and actions and to integrate different viewpoints that lead to *"a deep understanding of a social setting from the perspective of the research participants"* (Bloomberg and Volpe 2018).

3.1. Case Selection

If European countries are to benefit from the economic and ecological advantages of digitalisation, then an assessment of the digital competences in society, business, and administration is necessary. DigComp 2.2: The Digital Competence Framework (Vuorikari et al. 2022), for example, is a popular framework to assess citizens' competences, but there is no framework that can be adapted to comprehensively address and assess the different stakeholders in a particular context.

Austria has always ranked high in e-government rankings, and Austrian public administrations have implemented the infrastructure and activities to ensure the digitalisation of front and back offices and the digital delivery of public services (European Commission 2020b). For the last 20 years, several efforts have been made to encourage the implementation and use of e-government—for example, the platform Österreich.gv.at as a one-stop-shop platform for citizens to access online services, the online portal "USP" (Unternehmerserviceportal for services that are relevant to businesses), and the app "Digitales Amt" (Digital Public Office) to help citizens and businesses interact with public authorities (Federal Ministry for Digital and Economic Affairs 2022). Digital public services are the DESI dimension that Austria performs best in: here Austria ranks 10th among EU countries, which is above the EU average (European Commission 2022). The digitalisation process of Austrian public administrations, infrastructure, and online services is continuously developed and updated. Future objectives include greater use of ICT tools in public administrations, the involvement of citizens in digitalising and delivering services (Edelmann and Mergel 2021), digital participation (Rosenbichler et al. 2020), and the extensive use of digital signatures and digital identities.

The Austrian digital strategies have been criticised in the past for lacking a holistic approach, not addressing the competences required (Edelmann and Mergel 2022), and not providing quantified targets and monitoring (European Commission 2020a). This makes Austria a particularly interesting case to study as the current digital strategy, the "Digital Austria in 2050" Strategic Action Plan (Digital Austria and Federal Ministry for Digital and Economic Affairs 2022), now emphasises the holistic development of competences for different stakeholders and developing measurable targets and continuous monitoring. The digital strategy is based on a participatory process that includes a broad range of experts and stakeholders, is continuously being expanded, and is to be iteratively implemented. This strategy is to update and harmonise different outdated strategies, foster digital transformation, and improve user-centric, modern e-government services. It has several aims: to increase the country's resilience and competitiveness; to strengthen its position as a digital innovation region and use of data for innovation; to shape education and training to increase its digital competitive advantage; and to facilitate digital communication between the state and citizens. To achieve this, measures to be included are the development of economic growth and jobs through the better use of data, the provision of more public services to citizens and businesses at a lower cost, and the use of digital innovation for education and research. The Austrian federal government has also responded to the need for digital qualifications to support businesses' needs for digital skills and to address large gaps between IT knowledge and security, as well as generational, gender, and urban–rural digital gaps. The "Digital Skills Initiative for Austria" (Bundesministerium für Finanzen and Digital Austria 2023) was presented on 7th December 2022 as part of the European Digital Skills and Jobs Coalition (DJSC, European Commission 2023a). The Austrian "Digital Skills Initiative" is based on the DigComp 2.2 competence model that represents the Austrian version of the European DigComp 2.1 reference framework (European Commission 2023b) and outlines the field of digital competences of citizens in the most general and comprehensive way possible. It bundles high-quality teaching of basic digital skills throughout the population and in stakeholders such as ICT experts, education institutions, the private sector, and public administrations. The initiative is to increase the number IT professionals, especially female IT professionals, promote digital talent, and develop a national digital skills reference framework that sets an example for the public sector

and makes the skills measurable and comparable. Strengthening digital competences in public administrations is to provide the foundation for a modern, service-oriented public administration in Austria.

Therefore, this study focuses on the identification of competences through the lens of the Austrian public sector, taking into consideration existing strategies, as well as the different internal and external stakeholders, and complementing these strategies with the findings of a qualitative analysis of experts.

3.2. Data Collection Method

We have chosen narrative expert interviews as a data collection method to gain insights into the different perspectives the experts can provide based on their professional involvement in digital transformation projects (Czarniawska 2004). Narratives can be conceptualized as people's constructions of organisational phenomena (Czarniawska 2004), and they represent a credible source of insight and knowledge to study organisational or cultural change, decision making in organisations, and the organisational experiences people have (Rhodes and Brown 2005). The narrative approach allows insights into real-life problems and their context, the significance attributed to a specific phenomenon, and the ambiguity and complexity of organisational phenomena (Vaara et al. 2016).

The sampling strategy was initially based on a purposive sampling approach and was then followed by a snowball approach (Robinson 2014). The purposive sample was based on a small sample of experts from Austrian public administrations. To ensure that further experts could be identified, each interviewee was asked who else they considered to be important actors in the public sector digital transformation. This snowball sampling led to additional interviewees until saturation was reached (Glaser and Strauss 1967). It was deemed that saturation was reached once the same names of experts were referred to the research team by the interviewees (Saldaña 2021).

This strategy yielded 41 experts from the Austrian public sector. The number of interviewees lies above the suggested 20–30 interviews, and the sample can therefore be deemed as large enough to answer the research questions (Miles et al. 2013). Thirty-three interview participants stemmed from the Austrian government sector, six from organisations from the private sector working for public sector clients, and two from the nonprofit sector who either work with or advise public administrations on digital transformation projects and strategies.

The questions of the interview guideline were developed using theoretical concepts of digital transformation and e-government (Mergel et al. 2019). The interviews were conducted by telephone or Skype and recorded for accuracy purposes. Prior to recording, the interviewees were asked for their consent to record the interview, and the anonymity of their responses was guaranteed. All recordings and transcripts are saved on a secure server at the University for Continuing Education Krems and can be accessed by one author only. For the analysis, the transcripts were anonymized, and the corresponding list of IDs has been stored and is accessible to one author only.

3.3. Data Analysis Method

The interviews were transcribed to ensure accuracy in the analytical process. Gioia's (2020) systematic methodology was used for the qualitative analysis, and the data analysis phase was divided into a first- and second-cycle analysis: the content of the transcripts were first broken down into smaller chunks and categorised by theme, and then analysed in detail. The transcripts were coded deductively first, that is, starting with the themes derived from Koddebusch et al. (2022), adding codes that inductively emerged from the data in the second cycle (Bloomberg and Volpe 2018).

3.3.1. First-Cycle Analysis

During the first-cycle analysis, the analysis of the data identified the stakeholders involved in the digital transformation in public administrations, and then categorised the

content of the experts' interviews into broad thematic chunks (Bloomberg and Volpe 2018) according to the competences provided in Table 1 below. The table contains the summarised description of each of the competences and a breakdown of its dimensions as defined by Koddebusch et al. (2022). This facilitated the second cycle of analysis of the data.

Table 1. Initial coding list (from Koddebusch et al. 2022).

Competence	Dimensions of the Competences
Business	Strategic planning, project management: use of simulation-based approaches (agent-based models or digital twins) to analyse the impacts of planned policies and actions
	Contact management: actively use multichannel social platforms (e.g., Twitter, LinkedIn) to stay in contact and exchange with the respective individuals and organisations
	Finance, accounting, and economics, to be informed and on top of digital assets, token economy, etc.
IS/IT	IS, architecture, tech assessment, enterprise architecture: knowledge concerning legacy systems and how to bridge the silos into, e.g., federated systems such as data spaces
	Cybersecurity: awareness of current threats and knowledge of respective emergency protocols
Organisation	Organisational design, workflow systems, administrative processes: being able to work on the principles of data governance, compliance regulations
Law	Admin law, data management, legal aspects and tools, frameworks: being aware of the existing regulatory environment, in particular to the own field of action, in addition to GDPR
Other competences	Professional experience, evaluation and research, socio-technical skills: regular training and further education in the domain of technology and digitalisation, including awareness programs for unintended side effects
Soft Skills	Leadership, conflict management and communication, mediations, and relationships: knowledge of how to use electronic communication channels to not only monitor and participate in day-to-day work but also to stay in contact with team members; understand the different (social) requirements of people, regularly reflect and adapt communication and work patterns in the digital space
Self-management	Self-organisation: profound use of tools and procedures to plan your work, including sharing options and interfaces to team members, other teams, and external persons

3.3.2. Second-Cycle Analysis

In the second stage of analysis, the data were reanalysed and codes reorganised (Saldaña 2021). During this phase, additional codes and in vivo codes formulated during the first stage of data analysis were either grouped into a smaller number of categories or added to the themes during the first cycle of the analysis. Particular attention was paid to nascent concepts that have not been adequately covered in the literature (Gioia 2020). The summary of the codes used for the analysis of each stakeholder group is displayed below in the Results section (based on Bloomberg and Volpe 2018).

4. Results

Key findings show that there is a broad range of competences deemed to be necessary, but different stakeholders need to have or develop different types of competences. This section contains the results gained from the analysis of the data according to the identified stakeholders: service providers to public administrations, consultants, public administrations, and citizens. To help understand the experts' experiences and perceptions, we provide direct quotes throughout the reporting of the findings (Gioia 2020; Pickering and Kara 2017).

4.1. Internal Stakeholders in Public Administrations

The competences described by Koddebusch et al. (2022) were seen as being relevant competences for internal stakeholders in the digital transformation of public administrations. As can be seen in Table 2, the most important competence that needs to be developed within public administration is the "soft skill" leadership, followed by functional IT skills and business competences. But several additional dimensions to the competences business,

IS/IT, other skills, and soft skills were identified as important for digital transformation in public administrations.

Leadership is clearly the central competence that needs to be developed in the digital transformation of public administrations. It requires business acumen and financial competences. Additional competences in the area of business are strategic planning, project management, and engaging with the other stakeholders: *"I simply believe that I see it a bit like the employees, the moment a[n organization] says: I'm preparing, or I'm starting to actively tackle digitalisation or to tackle it concretely, with concrete projects, I will then also engage the service providers who can also manage this topic, so that is then actually part of an overall strategy, so if we have said beforehand, what is important in the implementation, I have to analyse my stakeholders and then simply say, ok, I have my managers, I have my employees, I have my service providers, and I have to swear them to this transformation process and involve them"* (AT2).

Table 2. Competences for public administrations.

Competence	Description/Dimension	Nr. of Experts	∑ Nr. of Experts
Business	Strategic planning, project management: use of simulation-based approaches (agent-based models or digital twins) to analyse the impacts of planned policies and actions	11	∑39
	Contact management: actively use multichannel social platforms (e.g., Twitter, LinkedIn) to stay in contact and exchange with the respective individuals and organisations	1	
	Finance, accounting, and economics, to be informed and on top of digital assets, token economy, etc.	7	
Additional Business	New ways of working	14	
	"Fehlerkultur"	6	
IS/IT	IS, architecture, tech assessment, enterprise architecture: knowledge concerning legacy systems and how to bridge the silos into, e.g., federated systems such as data spaces	12	∑69
	Cybersecurity: awareness of current threats and knowledge of respective emergency protocols	9	
Additional IS/IT	Use of digital tools	8	
	Usability	1	
	Reduce fear of IT	10	
	Limits of IT	1	
	Digital skills	17	
	Data analysis and statistics	7	
	Implementation of IT	5	
Organisation	Organisational design, workflow systems, administrative processes: being able to work on the principles of data governance, compliance regulations	12	∑12
Law	Admin law, data management, legal aspects and tools, frameworks: being aware of the existing regulatory environment, in particular to the own field of action, in addition to GDPR	9	∑9
Other skills	Professional experience, evaluation and research, socio-technical skills: regular training and further education in the domain of technology and digitalisation, including awareness programs for unintended side effects	7	∑8
Additional other skills	*Additional skills are necessary*	1	

Table 2. *Cont.*

Competence	Description/Dimension	Nr. of Experts	∑ Nr. of Experts
Soft Skills	Leadership, conflict management and communication, mediations, and relationships: knowledge of how to use electronic communication channels not only to monitor and participate in day-to-day work, but also to stay in contact with team members; understand the different (social) requirements of people, regularly reflect and adapt communication and work patterns in the digital space	29	
Additional soft skills	Process management	23	∑156
	Marketing	6	
	Knowledge management	2	
	Innovation	15	
	Impact assessment	5	
	Change management	4	
	Agile management	10	
	Interest in the digital	10	
	Customer orientation	20	
	Collaboration	25	
	"Mindset"	7	
Self-management	Self-organisation: profound use of tools and procedures to plan your work, including sharing options and interfaces to team members, other teams, and external persons	2	∑2

Leadership requires a range of additional management competences, including change management, innovation management, and process management. Increasingly, agile methods and agile management skills are seen as an important dimension of a digital leadership role. It includes having the right mindset, one that helps the development of an organisational culture and allows experimentation and mistakes (the so-called *Fehlerkultur*, that is, a culture that allows errors), which at the same time helps to reduce the fear of the unknown or the fear of a digital future. This makes collaboration a central competence that needs to be developed within public administration: *"These will also be different people working together in teams and hopefully with great creativity on such transformation processes" (AT14)*. New ways of working between different stakeholders and new teams are necessary to collaborate and to understand the needs and expectations different stakeholders may have.

4.2. External Stakeholders: Service Providers, Consultants, Citizens

Experts provided insights into the competences public administrations themselves must have to successfully implement the digitalisation of public administrations together with their external stakeholders. In addition, the experts distinguished specific competences for external stakeholders, that is, service providers, consultants, and citizens, that facilitate digital engagement. External stakeholders such as service providers and consultants do not need to develop the full range of competences identified by Koddebusch et al. (2022); they must be able to advise public administrations on digital transformation issues and therefore must develop particular business competences and IT and IS skills. But they must also develop other professional skills and gain expertise in digital project management. A small number of experts suggested that these external stakeholders need to have a broad range of IT skills and the ability to take on a customer focus.

Service providers (Table 3) need to evolve from traditional ways of engaging with public administrations. Service providers must develop strategic business plans for digital transformation, update their professional expertise and knowledge, and be user-centric

when advising public administrations: *"It is undisputed that we don't know everything. It's undisputed that we can't do everything, but the last thing I need is a service provider who explains the world to me and who is then perhaps even so prepotent as to explain my world to me. I don't need a provider who [. . .] who presents me with a concept that he has already presented to 28 other companies, but I need a partner with whom I can approach the topic"* (AT35).

Thus, additional competences that service providers must have or develop include finding new ways of engaging and collaborating with public administrations, such as providing a clear and transparent strategy for the implementation of digital transformation, rather than merely selling digital tools under the guise of digital transformation.

Table 3. Competences for service providers.

Competence	Description/Dimension	Nr. of Experts	∑ Nr. of Experts
Business	Strategic planning, project management: use of simulation-based approaches (agent-based models or digital twins) to analyse the impacts of planned policies and actions	4	∑4
	Contact management: actively use multichannel social platforms (e.g., Twitter, LinkedIn) to stay in contact and exchange with the respective individuals and organisations	0	
	Finance, accounting, and economics, to be informed and on top of digital assets, token economy, etc.	0	
IS/IT	IS, architecture, tech assessment, enterprise architecture: knowledge concerning legacy systems and how to bridge the silos into, e.g., federated systems such as data spaces	4	∑5
	Cybersecurity: awareness of current threats and knowledge of respective emergency protocols	0	
kAdditional IT	Digital competences	1	
Organisation	Organisational design, workflow systems, administrative processes: being able to work on the principles of data governance, compliance regulations	1	∑1
Law	Admin law, data management, legal aspects and tools, frameworks: being aware of the existing regulatory environment, in particular to the own field of action, in addition to GDPR	1	∑1
Other	Professional experience, evaluation and research, socio-technical skills: regular training and further education in the domain of technology and digitalisation, including awareness programs for unintended side effects	9	∑9
Soft Skills	Leadership, conflict management and communication, mediations, and relationships: knowledge of how to use electronic communication channels to not only monitor and participate in day-to-day work but also to stay in contact with team members; understand the different (social) requirements of people, regularly reflect and adapt communication and work patterns in the digital space	1	∑3
Additional soft skills	Customer focus	2	
Self-management	Self-organisation: profound use of tools and procedures to plan your work, including sharing options and interfaces to team members, other teams, and external persons	0	∑0

Like the service providers, consultants must have professional expertise and knowledge competences that are kept up to date. Business competences are important for advising public administrations on digital transformation projects, but consultants should also have a range of additional soft skills such as previous experience and a willingness to adopt

unconventional approaches and use agile management when working with public administrations (see Table 4). Public administrations expect consultants to bring new ideas: *"We need people, both in the organisation and in the service providers and consultancy services, who think far outside the box and approach the problem in a completely unconventional way in order to have good solutions"* (AT14).

Table 4. Competences for consultants.

Competence	Description/Dimension	Nr. of Experts	∑ Nr. of Experts
Business	Strategic planning, project management: use of simulation-based approaches (agent-based models or digital twins) to analyse the impacts of planned policies and actions	2	∑4
	Contact management: actively use multichannel social platforms (e.g., Twitter, LinkedIn) to stay in contact and exchange with the respective individuals and organisations	1	
	Finance, accounting, economics be informed and on top of digital assets, token economy, etc.	1	
IS/IT	IS, architecture, tech assessment, enterprise architecture: knowledge concerning legacy systems and how to bridge the silos into, e.g., federated systems such as data spaces	1	∑1
	Cybersecurity: awareness of current threats and knowledge of respective emergency protocols	0	
Organisation	Organisational design, workflow systems, administrative processes: being able to work on the principles of data governance, compliance regulations	2	∑2
Law	Admin law, data management, legal aspects and tools, frameworks: being aware of the existing regulatory environment, in particular to the own field of action, in addition to GDPR	0	∑0
Other	Professional experience, evaluation and research, socio-technical skills: regular training and further education in the domain of technology and digitalisation, including awareness programs for unintended side effects	11	∑13
Additional Other	Agile management	2	
Soft Skills	Leadership, conflict management and communication, mediations, and relationships: knowledge of how to use electronic communication channels to not only monitor and participate in day-to-day work, but also to stay in contact with team members; understand the different (social) requirements of people, regularly reflect and adapt communication and work patterns in the digital space	0	∑3
Additional soft skills	Unconventional approaches	1	
	Customer focus	2	
Self-management	Self-organisation: profound use of tools and procedures to plan your work, including sharing options and interfaces to team members, other teams, and external persons	0	∑0

Table 5 shows that citizens are not expected to have business competences such as business skills, legal competences, or knowledge about organisational design—these are the responsibility of public administrations. Some experts highlighted the need to reduce citizens' fear of digital innovation, to support the development of citizens' trust in public administrations, and to ensure that citizens have adequate knowledge of cybersecurity issues and the spread of fake news. The main competences citizens should have are IT and digital competences: many experts argued that citizens need competences as described in

the EU digital framework (Vuorikari et al. 2022) in order to interact and engage digitally with public administrations. Not all experts agreed on this, arguing that citizens should not have to develop additional competences beyond those they already have for their other, daily digital activities: *"The fascinating thing about the new information technology is that it contains what actually constitutes man in his sociology, namely man is a homo ludens, a playing man. Have you ever received a new mobile phone and taken the manual and said, now I'll take a look at it?" (AT22).*

Digital competences are important to engage and collaborate with public administrations, but citizens must develop the soft social skills necessary for engaging with public administrations digitally. The skills necessary for engaging and collaborating represent new ways of working in society; they are not skills specifically necessary for interacting with public administrations.

Table 5. Competences for citizens.

Competence	Description/Dimension	Nr. of Experts	∑ Nr. of Experts
Business	Strategic planning, project management: use of simulation-based approaches (agent-based models or digital twins) to analyse the impacts of planned policies and actions	0	∑1
	Contact management: actively use multichannel social platforms (e.g., Twitter, LinkedIn) to stay in contact and exchange with the respective individuals and organisations	0	
	Finance, accounting, and economics, to be informed and on top of digital assets, token economy, etc.	0	
Additional business	New ways of working	1	
IS/IT	IS, architecture, tech assessment, enterprise architecture: knowledge concerning legacy systems and how to bridge the silos into, e.g., federated systems such as data spaces		∑87
	Cybersecurity: awareness of current threats and knowledge of respective emergency protocols	16	
Additional IT	No additional digital competences	11	
	Awareness regarding fake news	4	
	Use of digital tools	15	
	Use of digital services	10	
	Reduce fear of digital	4	
	Digital learning	6	
	Digital competence catalogue	21	
Organisation	Organisational design, workflow systems, administrative processes: being able to work on the principles of data governance, compliance regulations	0	∑0
Law	Admin law, data management, legal aspects and tools, frameworks: being aware of the existing regulatory environment, in particular to the own field of action, in addition to GDPR	0	∑0
Other	Professional experience, evaluation and research, socio-technical skills: regular training and further education in the domain of technology and digitalisation, including awareness programs for unintended side effects	1	∑1

Table 5. *Cont.*

Competence	Description/Dimension	Nr. of Experts	∑ Nr. of Experts
Soft Skills	Leadership, conflict management and communication, mediations, and relationships: knowledge of how to use electronic communication channels to not only monitor and participate in day-to-day work, but also to stay in contact with team members; understand the different (social) requirements of people, regularly reflect and adapt communication and work patterns in the digital space	3	∑9
Additional soft skills	Trust in PAs	3	
	Collaboration	3	
Self-management	Self-organisation: profound use of tools and procedures to plan your work, including sharing options and interfaces to team members, other teams, and external persons	2	∑2

5. Discussion

Kaur and Lodhia (2019) argued that there is a need to explore and analyse participants' perspectives and experiences as they are the ones who provide the insights about key success factors and challenges: this case study shows how experts define the competences that internal and external stakeholders must have for the successful digital transformation of public administrations. By drawing on Koddebusch et al. (2022), we were able to classify and compare the competences different stakeholders are expected to have in the digital transformation of public administrations, and we also identified additional dimensions to each competence for each stakeholder. The results allowed us to answer the two research questions.

The first question considered the competences that must be developed within public administrations to digitally transform their processes and service delivery. As noted by Ruben (2019), competences require both knowledge and skills, and a competency in one area can lead to increased enrichment in another. Public administrations are seen as requiring all the competences noted by Koddebusch et al. (2022): business competences, IT competences, legal competences, organisational competences, leadership competences, and soft skills. Three competences are seen as particularly important: soft skills (especially for those in leadership positions), functional knowledge about IT and IS systems, and business competences. The most important competence by far that needs to be developed is leadership competence, as it not only drives the digital transformation of the public service itself, but also commandeers the public administration as an organisational entity along with its processes. Less important competences mentioned by the experts in our case study include legal and self-organisational skills.

The results gained in this study clearly show the need for public administrations to develop leadership competences, more than any other competences. Armenia et al. (2021) had previously noted a need for new management and leadership roles within the public administration. Ruben (2019) argued that effective leadership is based on analytic competencies, personal competencies, communication competencies, organisational competencies, and positional competencies. Koddebusch et al. (2022) understood leadership as a soft skill that addresses conflict management, communication, mediations, and relationships to understand the different (social) requirements of people and to adapt communication and work patterns in the digital space. In this study, we were able to confirm the dimensions pointed out by Koddebusch et al. (2022), but also additional leadership dimensions such as process management, knowledge management, innovation management, impact assessment, change management, and agile management. The leadership competence also requires a mindset that includes an interest in the digital, collaboration, and customer orientation as stated by the European Commission (Directorate-General for Informatics 2018). This highlights how a holistic approach to digital transformation requires not only

the involvement of stakeholders, but a form of leadership that enables collaboration with other teams, departments, and organisations as well as with external stakeholders.

Using the framework developed by Koddebusch et al. (2022), we were able to identify several additional dimensions for each competence. (1) The business competence must include knowledge that goes beyond the strategic and management; it needs to consider new ways of working made possible through the use of digital tools, processes, and knowledge. It must contribute to developing a new organisational culture in public administrations; the current culture is described as the "*Fehlerkultur*", one that is dominated by a fear of making errors, which inhibits innovation and experimenting with new practices (Edelmann and Mergel 2021). (2) The functional IT competence is seen as central to address this and, contrary to Hofmann and Ogonek (2018), is just as important as the competence that includes social and soft skills.

The Austrian case shows that both competences described above are necessary for encouraging the development of digital skills and reducing the fear that prevents the use of digital tools, while at the same time remaining aware of the limits of what can be achieved with digital tools and processes, as well as the dangers (e.g., cyberthreats or fake news). In line with Krpálek et al. (2021), the soft skills dimensions of leadership help with conflict management and communication, mediations, and relationships. At the same time, the IT competence, that is, the knowledge of how to use electronic communication channels, is useful as well, to monitor and participate in day-to-day work, to stay in contact with team members and understand their different (social) requirements, to support teamwork and collaboration, and to adapt communication and work patterns in the digital space.

This study expands our understanding of how the digital transformation of public administration can have an impact on the competences that public administrations assume or want external stakeholders to have. The second research question therefore considers the competences external stakeholders need in order to use the services and engage with digitalised public administrations. Several experts highlighted that citizens, as external stakeholders, should not need to have or develop additional competences, but should be able to apply the competences they have already gained from new ways of working or other walks of life to access digital public services. This includes skills picked up while conducting online banking or online shopping that do not require the need to learn a skill, develop a competence, or consult a manual. But other experts disagreed, suggesting that citizens need to develop a digital competence to engage with public administrations, in particular IT competence. However, the IT competence is not about citizens knowing about IT and enterprise architecture, knowing how to assess technology, or knowing about legacy systems or how to bridge the silos in federated systems. Rather, this competence includes knowing how to navigate their way through the digital services offered and to be able to use them. We identified several additional dimensions here. Like public administrations, citizens should have basic digital skills to know how to use digital tools and services to reduce the fear of the digital and to be aware of cybersecurity issues, fake news, and online scams. Citizens should be encouraged to learn about digital environments and update their skills, perhaps by drawing on a digital competence catalogue, as this is important for their work as well as life in general.

The main group of external stakeholders are citizens, but the experts mentioned other stakeholders, and they, too, are expected to develop their competences. Both service providers and consultants are considered to be stakeholders and are expected to develop a range of competences and to provide public administrations their professional experience, such as evaluation, research, and socio-technical skills. They are expected to have regular training and to be up to date in the domains of technology to be able to adequately advise public administrations implementing a digital transformation strategy. Whilst service providers are expected to have IT competences, consultants should have business competences to support public administrations. In addition, the interviewed experts expected service providers to have a customer focus and to consider public administrations' specific needs, whilst consultants must advise using innovative approaches.

6. Conclusions

Digital transformation requires a broad range of competences. If competences are understood as the outcome of an educational process (Hartig 2008), they can help support the holistic process of change necessary for digital transformation (Mergel et al. 2019). Competency frameworks can help describe the competences needed, point out the occupational standards, and contribute to new qualification standards and training programmes in terms of the service, strategic goals, and policies as well as the new knowledge and skills public administration employees and their stakeholders need.

Austria is an interesting case to study because the digital strategy has been criticised for lacking quantified targets and monitoring and for a lack of acceptance of digital public services. The Austrian case study shows that public administrations are aware of the range of competences necessary for digital transformation, in particular a new type of leadership and digital mindset that will help with navigation through changes and disruptions. Stakeholders contribute to public administrations' digital transformation, but they need to have the necessary competences to be able to engage, contribute to the services, and provide feedback and insights. This makes stakeholder engagement central to the holistic transformation of public sector organisations and citizens, although the competences expected from different stakeholders vary; for example, not all experts believe citizens need to have additional competences to the ones they already have.

With this study, we were able to contribute to the existing literature in several ways. First, the results are only partially in line with previous studies and competency frameworks. An innovative and digital public administration must be able to identify the different competences internal and external stakeholders need, and studies by Hofmann and Ogonek (2018) or Vieru et al. (2015) have addressed only a narrower range of competences. This case study shows that a holistic approach to digital transformation needs a broader range of competences. Second, whilst in this study the competences noted by Koddebusch et al. (2022) could be identified, each competence must consider more dimensions and skills. This can be clearly observed with the leadership competence: it is a competence that requires a mindset that includes an interest in the digital, collaboration, and customer orientation as stated by the European Commission (Directorate-General for Informatics 2018), but also process management, knowledge management, innovation management, impact assessment, change management, and agile management. As digital transformation requires the involvement of stakeholders, leadership must enable collaboration with others, be they teams, departments, organisations, or external stakeholders.

The rigor in conducting the research and the high number of expert interviews conducted allows for a valid interpretation of the results and insights. But the study cannot claim to be representative of the whole of Austria with its nine regions, each with its own state government, education, e-government, and digital strategy, or other European countries if they draw on different competence frameworks or have different priorities in their digital strategies. In the future, more case studies based on qualitative research could be used to compare countries and to derive lessons learned to show how competences support the digital transformation of European public administrations.

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