

# eGovernment Competences revisited – A Literature Review on necessary Competences in a Digitalized Public Sector

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**Abstract.** With the growing proliferation of digital technologies, organizations at all levels are faced with a changing environment to which employees and leaders have to adapt. Digital competences can be considered a key factor for the successful implementation of digital technologies in organizations of all kinds. Public administrations are exemption from this trend and are the focus in this study as a special organizational form. Despite the importance of these competences, extensive research on this subject is yet missing. To better understand the shape of knowledge contributions made so far, a structured literature review is conducted to uncover the state of the art of research on these competences. Results of this study indicate that only very few scholars have so far researched public administration competences more closely. Besides functional competences, a focus on so-called soft skills and personality traits is unveiled. Based on the findings, directions for future research are derived.

**Keywords:** eGovernment, digitalization, competences, literature review

## 1 Introduction

“[P]olicy makers face a race between technology and education, and the winners will be those who encourage skill upgrading so that all can benefit from digital opportunities” [1]. This statement nowadays becomes a postulate amongst decision makers worldwide, given the growing realization that digitalization is not just a temporary phenomenon but rather a revolutionary game-changing intrusion: “The number of internet users has more than tripled in a decade—from 1 billion in 2005 to an estimated 3.2 billion at the end of 2015. This means that businesses, people, and governments are more connected than ever before” [1]. On the one side, this offers great potentials, but at the same time organizations’ and peoples’ competences are heavily challenged by digitalization, needing to constantly adapt to an ever changing environment [2]. This is equally true for all organizations that in large part have acknowledged the need for the right skills in a digital world, but when being asked if

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their employees embody these competences “[...] 53% rather or strongly disagreed with the statement” [3]. The increased use of information systems has entered public administrations worldwide equally and governments also have started to recognize the potential benefits in terms of efficiency and effectiveness gains, if comprehensively leveraged. Yet, “[s]uccessful digital transformation comes not from implementing new technologies but from transforming an organisation to take advantage of the possibilities that new technologies provide” [4]. Thus, the transformation needs to be thoroughly prepared and implemented, since it greatly affects the way the work is done and organized, and requires organizational adjustments [5], [6]. [7] point to the fact that employees from all organizational layers need to refresh their digital skills as a prerequisite for digital transformation to be successful. [8] advocate for a better understanding of this changed environment in order to equip “[...] students with useful models, methods, and technical skills for customer-centric and service-centric information systems” [8].

The basic assumption underlying this study is that competences are a key resource for the successful implementation and use of digital technologies. If public administrations wish to exploit the full potential of digitalization, the development of competences to deal with a diverse set of technologies should therefore be of equal importance as the development of the technology itself. Yet, in spite of the topic’s importance, scientific contributions in this area, are only rarely to be found and do not seem to be among the domain’s research priorities [9], [10], [11]. There are few attempts that started the endeavor to structure the competence necessities for eGovernment education, e.g. [12], [13], [14]. In this context, it is especially [14], who are the only ones that offer a differentiated clustering of necessary competences. Their study, however, was already published in 2015. Therefore, we would like to find out, how this line of research has developed since then and put forward the research question: *Which competences do public administrations employees need from a research perspective?*

## 2 Research Background

Next to providing definitions of key concepts in order to establish a clear understanding, we also investigate existing research on competences. The term *competence* used throughout this study refers to the combination of an individual’s work-related knowledge, skills and abilities [15]. In accordance with prior research [16], we propose that competences are a key prerequisite for the skillful use of information systems. With the increased use of Information Systems (IS), the way public bodies act is and will keep changing considerably. In general, the organization’s technical infrastructure has the power to improve its performance significantly. "In particular, information systems are considered to be a major asset for leveraging organizational transformation owing to the disruptive nature of IT [Information Technology] innovations, the deep digitalization of business, and their cross-organization and systemic effects, notwithstanding the amounts of investments in enterprise systems." [17]

Even though there are huge efficiency and productivity gains ascribed to the use of IS in public administrations [18], employees have to be provided with digital competences to be able to work in the digital age [19]. The adequate preparation of public servants is therefore indispensable, because the success of implementing IT highly depends on the employees' skills and expertise [20], [21]. Despite its importance, as has been mentioned before, education in the area of eGovernment has not yet been a major topic of interest in research. However, there have been limited intents to identify the necessary competences. Early studies on required competences in the public sector mainly focused on IT competences, e.g. [2], [22]. It is rather later studies that acknowledge the need for more diversified skill sets [23], [24]. Yet, it seems that these competences are not very well covered. According to a report by the European Commission, almost one quarter (23%) of the total EU population has no digital competences at all. Although this ratio is better amongst the working population, where only 14% have no digital skills at all, 39% are considered to have an insufficient level of digital skills [25].

However, quite some practice frameworks have been set up to classify and cluster the necessary competences, notably in the context of the ongoing *digitalization*, which can be referred to as “[...] the manifold sociotechnical phenomena and processes of adopting and using these technologies in broader individual, organizational, and societal contexts.” [8] The Skill Framework for the Information Age (SFIA), for instance, is a reference guide, describing 97 skills for employees in information systems-related roles of any type. It provides a reference model embracing two dimensions, namely skills and different levels of responsibility [26]. Another framework to cluster “e”-related competences is the European e-competence framework (e-CF) [27]. The framework, initially developed in 2005, is designed as a means for describing necessary IT professionals' skills and knowledge requirements. It is based on 40 predefined competences, split into five ICT (Information and Communication Technology) areas. It relates to the European Qualifications Framework with five different proficiency levels. Both frameworks offer guidance for practitioners working with IT, however they do not consider the peculiarities of the public sector, inhibiting their application to the domain of eGovernment.

Therefore, another study, developed by [14], seems to be more promising, since it offers a categorization of different competence categories and is especially designed for the public sector. It builds on the findings from earlier studies in the same domain. Consisting of five different competence categories, which are composed of technical, socio-technical, organizational, managerial and political-administrative competences, it offers a more differentiated view on this topic. Technical competences are IT-related skills like the fundamentals, strategy and design of Information Systems (IS). Socio-technical competences encompass all the skills that are located at the interface of technical systems and human beings and involve both of them. Examples for such competences are framework requirements on the impact of eGovernment/technology. Organizational competences refer to the organizational integration of IT/eGovernment, organizational structures, process management etc. The category of managerial competences deals with business-related and management skills in the context of IT/eGovernment, like project, change and financial management. Political-administrative competences consist of skills that deal with the environment that

IT/eGovernment is embedded in. Examples are legal conditions and policies. These competences seem to better grasp the competence diversity needed in the public sector. Although this framework is a valuable approach, it is one of the very few attempts to systematically cluster competences and derive explicit categories. Further systematic research on which competences public sector employees need for the digitalization, has not been put on the IS research agenda.

### 3 Methodology

In order to uncover the status quo of research on competences in the public sector, we conducted a structured literature review, following the guidelines by [70]. Following their approach, we did not focus on one specific discipline, but widened the scope of our research. Contrary to the propositions by [70], we did not focus exclusively on journals but intentionally decided to include different kinds of publications, because of the fact that research on competences just recently gained in academic interest in the public sector [11], [12]. We first defined a set of relevant search terms that included synonyms to *competence* and *public administration* as well as *eGovernment*. We included the term e-government and variations of it, because a lot of research around the digitalization of public administrations is summarized under this umbrella term. In addition, we ran a second search in the database, this time reducing the search to articles also including keywords on digitalization, innovation or technologies. We used the database *SCOPUS* as it allows for various settings and includes a wide range of scientific outlets. The results were limited to outlets from the year 2000 onwards, because of the rapid changes technologies have undergone since then and it can be assumed that the needed competences have changed as well. As the study does not only aim at describing the status quo of research on competences in public administration but also on deriving an agenda for further research, this limitation is valid. Combining both searches led to a total set of 1235 articles. We excluded all results of doubtful quality, such as students' theses and grey literature as well as all non-scientific articles. Also, we only considered English articles, assuming that important research is published in English to make it accessible to a broader audience. We did, however, consider full as well as research in progress-papers and journal articles as well as conference proceedings and book chapters. Based on the title and abstract, we assessed the remaining articles with regard to their fit for this study's aim. The inclusion criterion was whether the development of *competences* in or for *public administrations* was a key topic of the articles. Although we rather included than excluded articles, also in borderline or unclear cases, in the end we only considered 63 articles to be relevant. We read these articles to evaluate whether they dealt with competences as a core topic or not. After a thorough pre-evaluation, a final set of 21 articles remained. 42 articles were not considered in the end, because they either purely focused on IT skills or they had a very specific target group that would not allow for comparability. We eliminated the majority of articles, because they only mentioned competences and/or skills on a side note, without specifying their nature and making them an explicit unit of analysis or the studies mentioned skills and competences as one factor influencing adoption

decisions without further distinguishing the needed competences. With the remaining papers, we conducted a *forward* and *backward* search, applying the same inclusion and exclusion criteria as set forth above. All articles referencing one of the 21 articles were assessed which led to the inclusion of another 7 articles. For this search, we used *Google Scholar* as it yielded considerably more citations than SCOPUS. In the same way, we also examined all articles cited in the first 21 papers and included another 14 articles as relevant in our final data set.

## 4 Results

The final sample contains 42 articles (see Table 1). Out of these, 26 were published in journals, 13 of them were conference proceedings and 3 articles were book chapters. All articles were published between 2000 and 2018. Table 2 contains all identified sources, their shortened title, and outlet form. We also evaluated the extent to which the analyzed articles referred to each other as indicated by the columns ‘citing’ and ‘cited by’. This analysis shows that only few articles refer to others in the sample and are frequently referred to by others such as [14], [21], [28] and [29].

For the analysis, we intentionally decided against following the chosen categorization of competences by the authors, although most articles already included some kind of categorization. We decided for breaking them up to identify patterns or differences ourselves. We did this to first eliminate possible ambiguities that could exist due to the authors’ different foci and chosen terms and second to not overlook any skills that we would not have expected in certain categories. The articles’ categorizations were coined very differently, given the difference in focus of the respective article. [62], for example, deal with skill sets of a successful collaborator, which is why their article naturally concentrates primarily on personality traits and soft skills. We found that similar skills were categorized differently in different articles; therefore, we summarized them in a new category.

**Table 1.** Articles identified by the literature review

<i>Authors</i>	<i>Outlet</i>	<i>Source</i>	<i>citing</i>	<i>cited by</i>
Leitner 2006 [29]	Cnf	D	-	[21], [30], [31], [32]
Banerjee et al., 2015 [33]	Jnl	D	-	-
McQuiston & Manoharan, 2017 [34]	Jnl	D	[35]	-
Michelucci et al., 2016 [36]	Jnl	D	[37]	-
Marzullo & Souza, 2011 [38]	Jnl	D	-	-
Gharawi et al., 2014 [39]	Cnf	D	[12], [20], [21], [40]	[41]
Hoefler, 2003 [42]	Jnl	D	-	-
Getha-Taylor & Lee, 2008 [43]	Jnl	D	-	-
Mancebo Fernandez et al., 2008 [44]	Jnl	D	-	-

Auluck & Levin, 2009 [45]	BC	D	-	-
Awortwi, 2010 [46]	Jnl	D	-	[47]
Haq, 2011 [48]	Jnl	D	-	-
Gupta et al., 2017 [28]	Jnl	D	[49], [50], [51], [52], [46]	-
Mincu, 2017 [53]	Jnl	D	[54]	-
Hunnius et al., 2015 [14]	Cnf	D	[55], [29], [21]	-
Yuryeva et al., 2015 [56]	Jnl	D	-	-
Iwasaki, 2014 [57]	Cnf	D	-	-
Gunn et al., 2014 [58]	Jnl	D	-	[59]
Hunnius & Schuppan, 2013 [21]	Cnf	D	[29]	[60], [61], [39]
o'Leary et al., 2012 [62]	Jnl	D	[63]	-
Schuppan, 2014 [64]	Cnf	D	[65]	[14]
Williams, 2002 [65]	Jnl	B	-	[62]
Thudugala & Weerawarana, 2013 [55]	Jnl	B	-	[14]
Virtanen, 2000 [52]	Jnl	B	-	[28]
Hondeghem & Vandermeulen, 2000 [66]	Jnl	B	-	[49]
Noordegraaf, 2000 [37]	Jnl	B	-	[40]
Mincu, 2016 [54]	Cnf	B	-	[53]
Marcovecchio et al., 2013 [40]	Cnf	B	-	-
Janowski et al., 2012 [12]	Cnf	B	[29], [30]	[39]
Schuppan, 2010 [30]	BC	B	[29]	[14]
Getha-Taylor & Morse, 2013 [51]	Jnl	B	-	[51]
Getha-Taylor, 2008 [63]	Jnl	B	-	[62]
Dawes, 2004 [35]	Jnl	B	-	[34]
Brans & Hondeghem, 2005 [50]	Jnl	B	[49], [66]	[28]
Bhatta, 2001 [49]	Jnl	B	[37], [52], [66]	[28]
Stare & Klun, 2018 [47]	Jnl	F	[46]	-
Ylinen & Pekkola, 2018 [41]	Cnf	F	[39]	-
Darling & Cunningham, 2016 [59]	Jnl	F	[58]	-
Ogonek et al., 2016 [60]	Cnf	F	[21]	-
Reichard & van der Krogt, 2014 [61]	Cnf	F	[21]	-
Schulz & Schuppan, 2011 [31]	BC	F	[29]	-
Schulz & Schuppan, 2012 [32]	Cnf	F	[29]	-

*Key: Jnl=journal article; Cnf=conference paper; BC=book chapter; D=database search;  
B=backward search; F=forward search*

In total, we identified two overarching categories, i.e. competences and personality traits. Those were split again into 12 sub-categories, identifying the concrete skills. Table 2 exhibits all sub-categories with exemplary mentions and corresponding references. The first identified category contains competences, which can be subsumed as all the skills and abilities that are related to a certain professional area or field, i.e. functional competences. The analysis of those competences yielded eight sub-

competence areas. *Business skills* are mentioned most often. 33 of the 40 articles relate to some kind of business expertise. Competences in this sub-category relate to the organization and management of a public agency but are not necessarily domain-specific. Exemplary competences are project, program, performance and strategic management, which are among the most often cited ones. HR, economic, finance and accounting and marketing skills also fall into this category. Besides those business-related skills, *IS/IT skills* are the second most often cited competences that appear in 28 of the 40 articles. Again, skills listed in this category are not necessarily domain-specific and could be applied to competence frameworks for private organizations as well. Whereas some authors describe this category very generic with “IT content” [34] or “Familiarity with ICT systems” [33], other authors elaborate more detailed on those skills, like [38], [39] or [14], who mention concrete competence areas such as architecture, cyber security and managing information systems.

The next category *organization* unites abilities that are centered in the organization itself and, thus, are domain-specific. Competences in this sub-category deal with the characteristics of an organization, thus including skills such as administrative processes, organizational design or the identification with one’s agency. This sub-category is mentioned in 23 articles and, thus, seems to be an important asset in the job profile of the public sector. *(Public) Policy* was mentioned in 21 articles and includes skills such as knowledge about an agency’s policy area, policy planning and politics. The category *law* occurred in 14 articles and is concerned with all legal aspects that arise in the work of a public administration. Those two sub-competence categories seem to be very specific to the public servant’s profile. The next sub-category summarizes competences that were either rarely mentioned or could not be grouped in a meaningful way to any other competence category, but still we deemed them worth mentioning. They are grouped under the name *other* and include competences in research (2 sources), socio-technical skills (5 sources) and professional experience (6 sources). After having categorized all the “hard”-knowledge based competences (functional competences), the last competence category lists all the *soft skills*, i.e. abilities that can be trained but do not count as knowledge. These competences are unrelated to any specific domain and include, for example, communication skills, teamwork, leadership, customer and service orientation and alike. It is noteworthy that those skills appear in 37 of the 40 articles and can thus be considered as highly important. Only in the categorization by [14] they are not explicitly mentioned. Within this group, especially the soft skill “leadership” is prominently mentioned in 25 articles. The second identified category are personality traits. Those traits are inherent to a personality and are not related to a specific (job-related) task. Furthermore, they cannot be acquired through formal education. We identified four sub-categories here. The most frequently mentioned one are *analytical skills*, which appeared in 24 articles. Analytical skills are more geared towards how a person tackles tasks and challenges.

**Table 2.** Identified competences and personality traits in identified articles

<i>Type</i>	<i>Area</i>	<i>exemplary competences/personality traits</i>
competence	business	strategic planning [29], [34] project management [33], [65]; program management [41], [57]; contact management [31], [41]; finance [36]; economics [47]; accounting [36],[42]
	IS/IT	management (information) systems [42], IT skills [14]; information systems [43], [47]; cyber security [39]; enterprise architecture [38]; technology management & assessment [57]
	organi- zation	organizational design [12], [14]; administrative processes & workflows [21],[37]; coordination/implementation [32], [48]; identification with agency [42], organizational theory [34]
	(public) policy	public policy [28],[46]; knowledge of agency's policy area [42]; social policy [42]; policy planning [45]; politics & political processes [65]; policy processes [31]
	law	administrative law [21]; legal aspects for data management [36]; legal tools [36]; legal aspects [39]; legal framework [40]; regulatory theory [53]
	other	professional experience [36], [42], [50]; evaluation & research [42], [61]; socio-technical skills [14], [35], [40]
	soft skills	leadership [56]; conflict management/negotiation [55]; (cross-cultural/unit, oral & written) communication [62]; mediation [62]; assertiveness [44]; influencing [54]; relationship [63];
personality	character traits	tolerance [33]; continuous learning [39]; creativity [48], commitment [45], [52]; tenacity & perseverance [44], flexibility [50]
	analytical	critical thinking [58]; analytical thinking[55]; strategic & innovative thinking [51]; decision making [49]; problem-solving [48], abstraction [41]
	self- management	self-organization [64]; self-control [28], self-awareness [62]; self-confidence [63]; self-reflection [64]
	other	psycho-social stability [45]

This category subsumes employee qualities indicating a view behind one's own horizon, i.e. critically reflecting on past events but also planning and envisioning scenarios, which requires thinking out of the box. The next sub-category consists of *character traits*. In contrast to the analytical skills, the articles here mostly describe more than one character trait and mention certain types of personality that public agencies need or look for. Character traits named here are, for example, tact, respect, patience, tolerance, and alike. Those seem to be preferable character traits in public administrations. This personality trait appeared in 23 of the 40 articles. The third sub-category of personality traits, mentioned in 14 articles is some kind of *self-management*. Again, competences in this category are more related to an employee's professional behavior. Those characteristics include self-organization, self-control and self-reflection, amongst other similar traits. The last sub-category under personality is coined *other*, which includes psycho-social stability. This sub-category was deemed so special, although it only appeared in one sole article that we decided to add it.

## 5 Discussion

The purpose of this research was to identify which competences public sector employees need from a research perspective. The analysis of articles allows drawing several conclusions, which we present in the following.

*First*, the literature review shows that only very few articles deal with the development of competences in the public sector. Moreover, only seven articles were published after or at the same time as the study by [14], which was a review of prior research on competences in the public sector as well. Although organizations such as the EU have recognized the need for the development and education of administration specific competences [27], this area has so far received only little scientific interest. While eGovernment scholars often mention competences as an important driver of the digitalization of the public sector, the study of competences in the public sector is still in its infancy. Although only few articles deal with the training of competences in the public sector, these studies analyzed a variety of different competences that public administrations need. Moreover, the studies do not differentiate whether the competences are needed everywhere to the same degree or not and if one employee should be trained equally in every competence category. Although, on a higher level, they differentiate between leaders in the public administration, e.g. [62] and employees, e.g. [44] and between IT related jobs, e.g. [38] and non-IT related jobs, e.g. [58], finer grained differentiations are not applied. For example, it remains unclear, whether the identified competences are needed in the public administration in general or whether they are task-specific. For example, an accounting clerk may need different competences than does the caseworker. Furthermore, ambiguities exist with regard to the relevance of specific competences for the different administrative levels. While some studies focus on a specific administrative level, e.g. [58], most of the articles do not provide information on whether the need for particular competences varies between the administrative levels. Again, the competences required of a municipal employee may differ from those required of an employee at the national level.

*Second*, our results show that all analyzed articles are empirical studies, whereas conceptual and theoretical approaches are missing completely. It is noteworthy that only few articles refer explicitly to conceptual works, e.g. [62], [34]. Instead, most articles directly introduce their method, e.g. [14], [56], rather than reviewing theoretical approaches related to the development of competences for the public sector, e.g. [36]. The focus of current research on empirical studies leads to the production of practically relevant knowledge but contributes to a lesser degree to the scientific body of knowledge. [34] point out: “As a *pracademic* field, public administration is based on the integration of academic concepts with its practical applications, as its boundary and scope are increasingly expanded in an ever-complex world”. However, the exclusive emphasis on empirical studies revealed by means of the literature review raises doubts if scholars in the field of competence research actually “[...] strive to maintain this balance” [34] between practice and academia. Accordingly, we find that only very few of the articles include references to another paper of our sample, although all articles deal with the development of eGovernment competences. This finding highlights a need

for a better linkage of existing research. This fact is all the more astonishing as most of the papers are published in related outlets such as the proceedings of the *Hawaii International Conference on System Sciences* [12], [14], [21], [29], [64], *Public Administration* [50], [65], *Public Administration Review* [62], *International Review of Administrative Sciences* [46], *International Journal of Public Sector Management* [37], [52] or the *International Journal of E-Government Research* [38]. Thus, we propose to better link existing research on eGovernment competences and to conduct more conceptual research to establish a common theoretical understanding.

*Third*, the review shows that number of specific competences is very high. The proposed framework of competences for the public sector should, thus, be refined and validated – theoretically and empirically. As outlined above, the analyzed articles do not provide any information on whether the identified competences are task-specific or should be trained in general. Thus, the question remains to what degree employees in different departments should be educated in every category. To the best of our knowledge, only one study exists, which was implemented for the German IT planning council, that takes into consideration that competences may be task-specific and that the distribution of competences may depend on the specific job profile of an employee [67]. The authors distinguish the development of competences with regard to two aspects: First, public administration staff may need different competences according to their task or role. Second, the employees needing the same competences may not need them to the same degree. The depth of the competence acquaintance ranges from designing (highest level) over usage to knowledge (lowest level) and is based on the well-known taxonomy of educational objectives by [68]. In accordance with this study, we propose to not only categorize competences that are needed in digital public administrations overall but to differentiate the competences on two levels. On the *horizontal level*, competences are distinguished in relation to tasks within the public administration. For example, leaders of public agencies may need more business skills than does a case worker who may need more personal skills. Not every task may require every competence listed in the framework (see Table 2). On the *vertical level*, competences are distinguished according to the degree to which they have to be appropriated by the employees, i.e. although employees may need the same competence, e.g. competences in enterprise architecture, one may only need to know what this term comprises, whereas another employee may need to design such systems.

*Fourth*, the literature review revealed that business skills are far more often required than technical or other competences. Although the ubiquitous digitalization is reality, research seemingly puts less emphasis on the training and recruitment of technical competences. Moreover, it is noticeable that public administration-specific competences are less often required as compared to business skills. The analyzed articles are less context-specific as one might expect. About half of the identified competences were not domain or task-specific but more related to the employee's personality (e.g. soft skills, character traits etc.). Thus, we conclude that competences independent from the tasks are equally important for the public administration as are task-related competences. In relation to the overall competence framework, this leads us to the assumption that instead of looking for specialists, public administrations rather seek all-round talents. Given that researchers have recognized the necessity of the

interplay between ICT and institutional settings as success factors for eGovernment implementation, e.g. [69], further research is needed that sheds light onto the specific competences public administrations need to successfully implement eGovernment, i.e. the framework proposed here needs to be validated. It also offers an estimation with regard to whether weighting of the competences as revealed by the literature review adequately addresses the challenges public administrations have to face in the digital age. Regarding the development of research on competences over time, it seems that the topic was of special interest in the beginning of the eGovernment area. 7 articles were published between 2000 and 2014. From 2005 to 2009, research on competences declined to 6 articles. It was not before the year 2010 that eGovernment competences received more attention with 17 articles published until 2014, which seems to go on, because since 2015 until today we could identify 12 articles.

## **6 Conclusion and Outlook**

This study set out to identify the competences public sector employees need from a research perspective. To answer the research question, we conducted a structured literature review on competences in the public sector literature. Our review shows that to date only few studies exist that are concerned with competences in the public sector. Within these studies, we identified two overarching categories, competences and personality traits that could be further split up into 8 and 4 sub-categories respectively. We set up a research agenda to list all future research directions that can be derived from this study. It shows that besides the need for functional or task-related competences like organizational or management skills, there is also an increased need for soft skills and personality traits. Task independent competences seem to be equally important for the public domain as are functional competences, thus requiring public servants to be all-rounders rather than specialists in one specific area. Having said this, future research should also consider examining the respective competence depth more critically, since not every employee is required to embody one specific competence in the same way. Given the limited amount of studies identified in total and the finding that those are primarily of empirical nature, more research on this topic is needed in general and especially with regard to theoretical contributions that provide a solid basis as a commonly agreeable set for further research in this area to build on. After all, a diversified look into interdisciplinary competences, required by public servants working in a digital environment today, only picked up real speed in terms of scientific contributions by the year 2010. Thus, this topic has gained considerably in importance and more contributions are to be expected. The main limitation of this study is the choice of database that naturally fails to provide a complete picture of competence research in eGovernment. Thus, further research should look into other databases to round out and verify these results. Due to the pace of changes, induced by technology, competences also might undergo much more frequent changes than it was the case before. This is why more and particularly constant research is required to monitor these developments to competently address possibly new challenges.

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