Competency Requirements for Transformational E-Government

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Abstract

One key aspect of e-government is its potential for an ICT enabled transformation of the public sector. Through ICT, new forms of collaboration and inter-organizational public service networks become feasible, making it possible to carry out the public sector’s tasks more efficiently and effectively. However, a rather significant gap exists between this transformational potential and the tangible results that have been achieved so far. One reason for this slow and cumbersome implementation seems to be that public managers lack the necessary competencies to bring the promises of e-government to fruition. This article analyzes the changing competency requirements for public managers that accompany e-government and describes the first steps in the development of an e-government competency framework for public managers. The article sums up the results of a literature review on e-government competencies, a survey carried out for the article, and data gathered in focus group workshops. Based on these results, a first set of e-government competencies is then outlined that goes beyond pure ICT skills. The article concludes with a discussion of the framework and its implications for human resource management in the public sector.

1. Introduction

E-government can be understood as the ICT-enabled transformation of the public sector to achieve better government (type-3, -4 definition of [1]). In this respect, e-government is more than just ICT implementation and on-line government, which reduces e-government to the on-line delivery of public services (type-1 definition of [1]). Instead, the broader transformational perspective of e-government takes into account the potential to reorganize the whole of the public sector through the use of information and communication technologies (ICT). Hence, ICT brings with it the potential for public managers to rethink which and how public services are produced and what actors are involved in which roles. The necessary networking and cooperation among public sector organizations, if carried out in a well-thought out, rigorous and consistent way, is expected to have a transformational impact upon what government does and especially how it does it. However, the term transformation is being used in many different ways in the e-government context (e.g. [2]; [3]). [4] defines systemic transformation as a second tier of transformation: Accordingly, the application of ICT goes beyond the mere instrumental use of ICT (first tier), but implies profound institutional change. It alters the relationships and behavior of the actors involved and thereby changes the model of public management and public administration itself (second tier). For instance, ICT makes it possible to separate public services into different processes, some of which are conducted in the front office, where public services are delivered, and others of which take place in the back office, where they are produced. ICT thus facilitates new organizational forms, like one stop agencies, which bundle a number of different services from a variety of agencies and offer them at one location (the "front office") – on-line or off-line [5]. This understanding forms the underpinning of the "joined-up" approach [6], which addresses policy-making and implementation issues across organizational boundaries, as ways to mitigate the effects of widespread fragmentation in the public sector. Hence, e-government is a major enabler of new forms of networked government [7], which are based on a complex socio-technical design.

2. Problem Statement

Compared to this ambitious understanding of e-government as “transformational government” [8], so far the results achieved in practice appear rather meager, with large projects of this kind often being considered failures [9], [10], [11], [12]. In the literature, a number of factors have been regarded as hindrances towards the implementation of e-government, such as institutional factors in the administrative system (e.g. [13]), characteristics of the political system [14], and citizen acceptance (e.g. [15]). One factor that is considered to hinder e-government reforms is insufficient or inadequate individual competencies on the part of public administration personnel (e.g. [16]). These competencies include both competencies involved in transforming the public sector with e-government, as well as in working in structures transformed in this manner. However, so far, little attention has been paid to e-government...
competencies either in practice or in academic research. Often, there is no established understanding of e-government competencies at all [17].

Because of the increasing importance of lifelong learning, the competency approach is enjoying larger recognition worldwide, as it focuses on the results of learning processes [18], [19]. In Europe in particular, the competency concept has become important in establishing comparability between educational degrees issued in different countries [20]. When applied in professional life, the competency concept takes into account what a person is able to do in a working context, regardless of how this knowledge has been acquired. Instead of formal qualifications and degrees, which differ throughout Europe, skills, techniques, expertise, and know-how become more important [20], [21]. While the qualification concept is input-oriented, the competency concept is output-oriented, i.e., regardless of formal degrees.

However, despite increasing interest in this competency approach, competency is a rather “fuzzy concept” [22]. In particular the terms competency and competence are often used inconsistently [23], [24]. While the term “competence” can be defined as the ability to fulfill a task to a certain, often specifically defined, standard, in comparison the more holistic term competency means the underlying attributes of a person, such as knowledge, skills, abilities, and attitudes needed to fulfill competence standards [23]. For this article, the goal of which is the identification of broader competencies as well as the standardization of specifically defined competences, we therefore use the term competences when talking about standardizable abilities. In contrast we use the term competency for the whole conglomerate of knowledge, skills, and competences as well as underlying attitudes and motivations required of a person [17].

To date, in practice, the topic of e-government competencies is – if at all – still being addressed in a very IS-dominated fashion. The same is true for the scientific community in public management and in the administrative sciences [25], which often very unilaterally still perceives e-government as an ICT subject [26], [27], [28]. Nevertheless, in practical projects and in the everyday work of public administration, it is becoming increasingly apparent that new competencies are required which go beyond the simple use of an ICT application, or even ICT specialist and tool knowledge [1]. A comprehensive change of competency requirements for all civil servant groups can be expected—and is already becoming apparent.

The function of public managers, that is to translate political programs into administrative action, gives them an elevated role in the politico-administrative system [29]. They serve as compilers and therefore need an understanding of the political system as well as of how the administrative system functions [29].

To address this competencies problem, this article asks the following research questions: Which competencies are considered necessary for managers of e-government implementation to reap e-government’s potential? What competencies are relevant which are not exclusively related to ICT? And finally, how can all of these competencies be systematized into a holistic framework?

Such a holistic framework of necessary competencies can serve as the basis in practice and academia for the design of training and Masters programs, as well as for workforce planning efforts. "E-government work force planning efforts […] offer organizations the opportunity to assess their current work force capabilities, determine future work force requirements in the context of e-government […], and implement strategies to eliminate gaps, both current and future, between work force capabilities and work force requirements" [40]. Currently, these competencies are not being systematized in public sector managers. This is despite the fact that these efforts are especially necessary, in light of, the challenges facing the public sector in many countries in the coming years, with e.g. a large part of the public work force retiring and financial resources becoming more and more scarce.

This article is structured as follows: at the beginning, the research methods employed will be briefly laid out. Second, the literature on e-government competencies will be reviewed to derive an initial set of competencies relevant in the e-government context. Subsequently, the results of a survey and focus group workshops with e-government experts will be presented in order to determine competency requirements. These results will then be analyzed and the necessary skills and competencies structured in what can be considered a first draft of an e-government competence model. To conclude, implications for human resource management in the public sector and open research questions will be outlined.

3. Methods

Competencies are generally methodologically difficult to determine [17]. Furthermore, the question
of changing and newly arising competencies in the context of e-government faces some significant challenges:

- There is no agreed and established job profile for an “e-government project manager” on which to draw upon. Furthermore, there is debate, whether e-government is a profession or an occupation [31].
- The understanding of transformational e-government in practice is at best mixed and rather incomplete. This poses an obstacle for a large scale survey, because it cannot be assumed that the respondents have an established understanding of the subject.
- Given the dynamics in the field of e-government and the time lag needed to adjust competency levels, a reflection about future competency requirements is necessary. This makes the task even more challenging, because participants not only need an understanding of which competencies are currently relevant, but must also predict which competencies will be relevant in the near future (“today’s Java is tomorrows legacy language” [35]).

Therefore, the methodology of this article is multi-staged: The previous research on the topic has been reviewed, inter alia conference contributions to IRSPM, EGPA, HICCS, DEXA from 2003 to 2010. Based on this analysis, an initial set of e-government skills and competencies has been derived which serves as the basis for an on-line survey. This survey was conducted among e-government experts in Bulgaria, Germany, Greece, and Romania as part of an EU research project. These countries have been chosen because they represent a sample of diverse administrative traditions. Furthermore, e-government is unequally developed in these countries, according to their score in e-government benchmarking studies [38] so that the survey respondents come from countries with different reform trajectories.

The questionnaire asked participants about the relevance of a skill or competency and the necessary level of that skill or competency in public administration. Respondents rated the relevance of a specific skill or competency on a four-tier scale, with zero meaning it would not be important and three meaning that it would be very important. The competency level definitions used in the survey followed the generic definitions of the European Qualification Framework. In the questionnaire, the term skills was used for more technical and methodological The survey results were validated and specified in more detail in workshops e-government experts in the various countries involved in the EU research project. In total, 67 experts who were either themselves public personnel or consultants or scholars from the field of e-government participated in these workshops. The results obtained from the survey and the workshops were then consolidated and systematized.

### 4. Literature Review

Until now, e-government competencies have hardly been discussed in the academic debate. Only a few academic articles addressing e-government-related competencies or skills exist (e.g. [31], [32], [33], [17]), and even these often lack the focus of this article. Other contributions elaborate on organizational capabilities [34] in contrast to individual competencies; do not explicitly address e-government but rather ICT in general [35], [36]; or focus on specific competencies or attitudinal aspects [37] without integrating these into a holistic approach to e-government competencies [11].

Academic articles on e-government competencies have only been published since around the year 2000 [17]. Similar to the discussion on skills necessary for ICT professionals in general [35], the first academic contributions addressing e-government competencies considered pure ICT competencies [26], [27], [28]. As in the ICT professionals domain, these were later supplemented [35] by non-technical competencies, such as process management [39]. Only a few academic contributions consider new interdisciplinary knowledge or mixed competencies, including competencies necessary in the public sector domain in a more networked environment [32], [39], [33], [17].

[32] conducted a survey among European e-government practitioners about the status of e-government competencies in national action plans and e-government strategies and, in addition, analyzed six.
e-government projects in European countries. Using a similar methodology, [17] interviewed civil servants from a German state and selected external e-government experts and furthermore analyzed two German e-government projects. [39] analyzes the strategy of OECD countries in relation to e-government competencies. [28] derive their findings from practitioners' reports and a survey of public sector managers in Malawi. Most of these contributions highlight e-government competencies with a rather holistic approach, yet without structuring or integrating them into a framework. Only [39] categorizes the competencies rather broadly into information technology, information management and information society skills. The different e-government competencies that are mentioned in these articles are assembled in Table 1.

In a conceptual model for e-government education, [31] address inter alia the issue of what e-government competencies actually are. They relate this question to the eight different stakeholder groups which they identify, of which the role of the project manager is the focus in this article.

**Table 1: Review of e-government skills and competencies**

<table>
<thead>
<tr>
<th>Paper</th>
<th>Competencies for public managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mundy et al. 2001</td>
<td>basic knowledge (k.) of information technology, design options and methods of developing IS; k. about the nature and role of information and IS, organizational systems and processes, organizational strategies, and IS policies; skills (s.) to identify opportunities for new IS, design and construction of software systems, project and change management; communication, negotiation, and problem-solving s.; stakeholder management</td>
</tr>
<tr>
<td>Settles 2005 [33]</td>
<td>basic ICT s.; leadership s.; human capital s.; knowledge management s.; project management s.; modeling s.; s. to deal with legal implications of IS privacy; evaluation s.</td>
</tr>
<tr>
<td>Parrado 2005 [39]</td>
<td>business s.: matching business strategy to new technologies; information management s.; information technology s.: strategy and planning, system development and implementation, service and user support; information society s.: stakeholder management, technological literacy and ICT awareness, implementation and evaluation management</td>
</tr>
</tbody>
</table>

| Leitner 2006 [32]  | basic ICT s.; leadership s., social and soft s.; organizational s.; project and contract management s.; information and knowledge management s.; e-government models and strategies |
| Schuppen 2010 [17] | design knowledge (legal, technical, organizational); negotiation s.; persistence; thinking in terms of networks; stress resistance; implementation competency; design competencies |

By combining the competencies mentioned in the literature to date, an initial set of e-government competencies has been assembled (Table 2). This set includes public management-related competencies (e.g. contract and performance management) mentioned by [32] and [39]; IS-related competencies (e.g. IS strategy and ICT literacy) mentioned by [28], [39], and [32]; organizational design-related competencies (e.g. process management, juridical and organizational design) mentioned by [28], [33], and [17]; personal and social competencies (e.g. persistence, stress resistance, communication, and leadership) highlighted by [28], [32], and [17]. In part, these were then specified in more detail, something which is necessary for a competence model. This final set of competencies then formed the basis for the survey that was conducted.

5. Survey and Workshop Results

The skills considered the most important for e-government project managers across all project countries are project management, process management, organizational design, risk management, and IS strategy skills (Table 2). Results across countries were very similar: In every country, at least four of the five general skills (highlighted in bold) considered most relevant for project managers were among the top five general skills for all countries surveyed. Thus, there is a significantly homogeneous understanding of e-government skills for project managers, consistent with earlier research [32].

**Table 2: Relevant Skills for Project Managers**

<table>
<thead>
<tr>
<th>Skills for Project Managers</th>
<th>BG</th>
<th>DE</th>
<th>EL</th>
<th>RO</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Management</td>
<td>2.84</td>
<td>2.81</td>
<td>2.76</td>
<td>3.00</td>
<td>2.85</td>
</tr>
<tr>
<td>Process Management</td>
<td>2.68</td>
<td>2.63</td>
<td>2.60</td>
<td>2.90</td>
<td>2.70</td>
</tr>
<tr>
<td>Organizational Design</td>
<td>2.42</td>
<td>2.53</td>
<td>2.56</td>
<td>2.82</td>
<td>2.59</td>
</tr>
</tbody>
</table>

1 BG = Bulgaria; DE = Germany; EL = Greece; RO = Romania.
The personal and social competences assessed as very important for the e-government project management were communicative competency, self-management and cooperation competency as well as leadership.

The participants in the workshop discussions focused heavily on the social and personal competencies needed by an e-government project manager. The personal competencies that were mentioned centered on the project managers ability to withstand conflicts, overcome obstacles, and handle complexity and uncertainty. A project manager therefore needs a high level of intrinsic motivation and must be enthusiastic about the transformational change in order to be a credible and authentic promoter of the project.

In regard to the social competencies, it was stressed that in order to establish e-government systems that cut across organizational boundaries, a project manager needs to be able to manage the various stakeholders in such a project. These include members in the different organizations involved, which are not subordinated hierarchically within the organizational structure. Therefore, it can be expected, that a project manager must rely more heavily on the ability to cooperate, negotiate and communicate. Communication becomes more relevant because of the possibly varied backgrounds of the participants, who may come from different policy and professional domains. Furthermore, a project manager needs to be able to “translate” technical requirements to the other actors in the project, as well as to political leaders. In addition, the ability to anticipate and analyze the different stakeholders' interests and rationalities is required. Therefore, the project manager would need a sophisticated understanding of the policy process involved.

To be able to not only to translate between the ICT professionals and the other stakeholders in the project, but also to assess the technical issues in the project, some understanding of IS architecture is necessary. This involves questions of interoperability and standardization, especially because a project can involve numerous organizations and affect their IS landscape.

Another important point mentioned by the e-government experts in the workshops centered on the knowledge of the wider sectoral and societal impacts of e-government. Such impacts include the changing relationship between the state and its citizens, as well as the democratic principles of the broader society. This brings in topics like open government and e-democracy, topics which are currently gaining traction in the public debate. Accordingly, e-government project managers need an understanding of these models and concepts, and must be aware of the official government policies related to them, in order to act upon them. These competencies, which previously not received due significance, were therefore added to the list of necessary e-government competencies.

### 6. Discussion

The results have shown that, in addition to IS-related competencies, a wide range of different skills and competencies are considered to be important in the context of e-government (i.e., mixed competencies). Thus it becomes apparent that public managers involved with e-government in particular need knowledge about the possible applications and opportunities of IS architecture, as well as operational process knowledge, so that they can understand impending changes and make strategic decisions. The governance-related leadership literature especially neglects this aspect, either by ignoring it or by assuming, more or less explicitly, that operational knowledge is not necessary for strategic skills.

The initial set of skills and competencies included knowledge areas and skills from several different disciplines (e.g. IS research, business administration, public administration) which could be considered to bias the survey results. However, in the survey these diverse skills and competencies were all judged to be highly relevant. This not only validates the pre-selection but also emphasizes the fact that e-government projects are highly challenging and sophisticated. Managing these projects thus requires...
political, juridical, IS and management competencies, as well as formidable social and personal ones.

The results confirm that project leaders face special challenges because they must possess profound interdisciplinary expert technical knowledge and heightened social competences. They also require specialist knowledge—sometimes in great detail—to be able to communicate with the different expert communities involved in these projects and to ensure the necessary broader political support. Remarkably though, ICT specialist competency was rated as one of the less relevant items in the survey. Instead, more generic non-ICT skills, e.g. project management, topped the list. Nevertheless these generic skills need to be applied to the special context and challenges in e-government projects. Therefore, only possessing general, e.g. project management, competency is insufficient. Instead, project managers must be skilled to cope with the special pitfalls and challenges that occur implementing e-government projects that include elements of organizational change and IS development.

Looking toward future developments, it can be assumed that the relevance of isolated competencies in ICT applications will decrease, in part because human-machine interactions will continue to improve. It can be expected that technical expertise will gain importance, because ICT will become an integral, self-evident element of work in public administration. Already, every branch of public administration—security, law enforcement, social services and others—utilizes ICT. It is becoming clear that the changes in competence requirements at issue have much less to do with digitalization and much more to do with new public administration procedures and processes. This also applies to executives. To date, however, there is a lack of consistent management and control concepts that address digital and spatially distributed work forms and the competencies related to such forms, which are necessary to manage and work within public service networks.

7. E-Government Competency Framework

Through a detailed analysis of the survey results and especially from the workshops in detail, it is possible to distinguish new core e-government skills and competencies closely related to e-government and informatization of the public sector from those which are already prevalent in the public sector and "merely" now need to be applied to e-government. We thereby differentiate between the first category of newly arising core e-government skills and competencies and the second category, which we term generic government competencies. For example project management has been adopted in different contexts in the public sector for some time, but in the context of e-government its techniques need to be adapted through the addition of IS project management components. In contrast, e-government strategies and policies and IS design are logically unthinkable without ICT application in the public sector.

Within these broad categories, we distinguish among the competencies based on their subject matter (e.g. design, management). Similar approaches can be found in the general IS competency literature. It categorizes competencies by patterns of skills considered important in different contexts, the types of activities performed when using skills or the organization that is most associated with the skill, to name some examples [35].

In light of the interrelatedness of the competencies and their interplay when applied (mixed-competencies), any attempt to force these competencies into a structure will admittedly result in some simplification and a certain loss of rigor. Yet, in our view, the differentiation of competencies according to subject matter makes sense, not just for analytical purposes, but also to make the framework more accessible. Furthermore, it highlights those specific competencies that are new in the context of e-government. This has practical relevance for human resource development, the underlying purpose of the competence model. By distinguishing the core e-government competencies from the rather generic government competencies, the need for further education becomes more obvious.

### Table 3: E-Government Competency Framework

<table>
<thead>
<tr>
<th>Competency Category</th>
<th>Competency Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic E-Government Competencies</strong></td>
<td></td>
</tr>
<tr>
<td>Change Competencies</td>
<td>Change Management, Project Management</td>
</tr>
<tr>
<td>Government Competencies</td>
<td>Administrative Law, Policy Process</td>
</tr>
<tr>
<td>Social Competencies</td>
<td>Leadership, Cooperation</td>
</tr>
<tr>
<td>Personal Competencies</td>
<td>Self-Management, Creativity</td>
</tr>
<tr>
<td><strong>Core E-Government Competencies</strong></td>
<td></td>
</tr>
<tr>
<td>Design Competencies</td>
<td>Organizational, Process, and IS Design</td>
</tr>
</tbody>
</table>
7.1. Generic Government Competencies

The so-called generic government competencies include personal competencies (creativity, self-control and motivation, and time management) and social competencies (leadership, cooperation and communication). These competencies gain higher relevance in a more networked and somewhat less hierarchical e-government working environment, which requires more cooperation across organizational boundaries. Furthermore, they include policy and legal competencies (policy process, administrative law and cultures, specialized law) and change-related competencies (project and change management skills and implementation competence). These latter categories are also more or less generic competencies that have been required in the public sector for some time, but which need to be applied to the special challenges in the context of e-government in order to implement transformational changes.

7.1.1. Change Competencies. Change competencies are necessary to ensure the implementation of an e-government initiative. Besides the more technical aspects of project management, implementation requires a skillful change manager to ensure that an e-government system not only functions technically, but becomes part of the daily routines of the organizations involved. Apart from generic change competencies, this requires skills in IS project management and inter-organizational project and change management. This is because transformational e-government projects often transcend organizational boundaries.

7.1.2. Government Competencies. This category is made up of competencies which, in their classic form, enabled public servants to act within a traditional bureaucratic organization: skills to follow administrative processes, to apply the specialized law of a policy domain, e.g. public health, and an understanding of the policy process and its impact on the machinery of government. In order to transform public administration with e-government, however, they need to understand not only how ICT must be applied to this machinery of government as a mere tool. Instead, they also need to be able to reflect on how administrative processes can be transformed by making use of ICT. E-government project managers have to be aware of the consequences of administrative law and culture as well as the impact of special law on a reform process. Furthermore, they need sophisticated skills to be able to mold an e-government project into the policy process in different organizations, policy areas or perhaps even jurisdictions – depending on the scale of the project.

7.1.3. Social Competencies. Social Competencies in general are highly important, because managers of e-government projects can rely less on existing hierarchical instruments, as these are limited to their own organization. Rather, they have to lead across organizational boundaries and communicate and cooperate within public service networks. They need to convey technological aspects to laypersons in this field and requirements to ICT professionals. Furthermore they have to ensure a shared understanding between actors with different organizational backgrounds and maybe even from different domains – such as tax administration and social security – who might be involved in a joint project.

7.1.4. Personal Competencies. Personal competencies that become more important in the context of e-government are self-management, creativity, and self-motivation. These are necessary to operate proactively in a less stable, less conditionally programmed environment. Self-management means the ability to work independently, manage time and priorities, and so forth, and also includes a project manager's ability to withstand conflicts and overcome obstacles as well as the ability to handle complexity and uncertainty.

7.2. Core E-Government Competencies

Among the so-called core e-government competencies which can be grouped together are the e-government management competencies (risk management, quality management, performance management, and contract management), e-government design competencies (organizational design, process design, IS design, ICT specialist, and marketing skills), eCompetencies (ICT literacy, information processing, and media skills), and e-policy competencies (e-strategies and e-policies, models and concepts, and information processing law). These are rather new competencies that arise in the context of e-government.

7.2.1. E-Government Design Competencies. Design competencies include skills and competencies from different disciplines, such as organization theory, IS design science, and business administration. These competencies are especially necessary to be able to
analyze, rethink and design ICT-enabled public service production and provision structures. These include IS-related competencies – such as IS design and IS programming – as well as significant non-IS-related organization and process design competencies that are necessary to take advantage of new design opportunities. As it is understood here, marketing competency is distinctly different from the sometimes truncated common use of the term: It means knowledge about and the skill to design a service according to the citizens’ needs, as well as how to ensure the usability and utilization of the service. To translate these user and citizen requirements into suitable e-government services also presupposes an understanding of socio-technical design.

7.2.4. E-Competencies. E-competencies are necessary to cope with the implications of ICT on the working environment – on an individual as well as on a higher organizational and sectoral level. On an individual level, we understand them as the competency to process information while having to deal with information overflow, complexity, and uncertainty. Media competency refers to the ability to apply certain necessary devices and applications, like e.g. workflow management systems. On a higher level, an e-government project manager needs to be able to envision, understand, and apply uses of ICT within the public sector, something we term ICT literacy.

8. Critical Reflection on the Competency Framework and Conclusion

Drawing on the literature, an initial set of e-government skills and competencies has been assembled. These have then been evaluated, expanded upon and specified in a survey and workshops in four European countries. Concerning the question of which competencies are necessary, especially non-IS-related ones, we have shown that e-government competencies encompass a large variety of different skills and competencies (i.e., mixed competencies) which go far beyond a limited set of IS-related competencies. The participating e-government experts have given special relevance to change (e.g. project and change management) and design-related (legal, technical, and organizational) competencies as well as various personal and social competencies. Thereby, previous discussions of e-government competencies in the literature have been consolidated, amended and systematized.

Based on these results, a competence model for e-government has been developed. The personal, social, professional and methodological competencies have been grouped together according to their subject matter. Among these competencies, generic competencies can be distinguished from those competencies that are specifically characteristic of e-government. These latter core e-government competencies can further be subdivided into design competencies, management competencies, e-policy competencies and e-competencies. It has thereby been shown that by clustering the different competencies according to subject matter, a structured framework of e-government competencies can be developed.

The framework contains a large breadth of competencies from different fields of knowledge. Thus, it is questionable whether one person can possess
all these different competencies. However, this may not be necessary, since it is a generic framework which would, in any event, need to be adapted to a specific job. Furthermore, it could be argued for some competency categories, that they could be assigned to different competency categories, or even that an entirely different categorization could be proposed. However, due to the interrelatedness of the competencies (mixed competencies), any category-based structure lacks a certain rigor. In addition, the significance of the category structure should not be overestimated, as it is the competencies themselves, not the structure, that form core of the framework.

A reflection on the methods employed in the study must take into account the general controversy about the validity of competency modeling [40]. In the study, the understanding of e-government was described and e-government experts assessed the relevance of various competencies based upon this understanding. As an intermediate step, the different tasks involved in e-government implementation could be specified and the competencies could be tied directly to these [41]. This approach would resemble the traditional task analysis approach to job analysis [42] and is considered to enhance rigor of the process [43]; [41]. Therefore, further research should look into specific tasks that are carried out in e-government implementation to validate the framework. This study, intended to develop a generic e-government competency framework and only for broadly defined job categories, can be used as a basis for such a validation.

Another limitation of the study is the number and selection of countries in which the empirical data were gathered. Further research should analyze whether the competencies selected also apply in other parts of the world, especially in Anglo-Saxon and developing countries.

During the next steps of the research, these e-government skills and competences will be specified in more detail. Besides improving the detail of the competency model, it also needs to be broadened to cover other roles involved in e-government. The conceptual model developed by [31] can serve as a framework for this undertaking. Accordingly, research questions which remain open include not only which competencies are relevant for the different roles involved in e-government (what and who questions). Rather, questions related to e-government education must be addressed, including (1) how the competencies should be developed; (2) where the education should be carried out; and (3) when the education should be delivered. In this respect, this article can only be considered a first step.

9. References


