


How gender is understood and analyzed in current e-government research – a scoping literature review

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Abstract: The division of gender into woman and man is controversially discussed in social discourse. Different approaches and proposed solutions are thereby addressed in the public debate. Building on that, this paper examines the prevailing understanding of gender in e-government research by means of a scoping literature review. The results show that although a binary understanding is prevalent in the studies examined, there is by no means a uniform understanding of gender. It has also been shown that gender is often considered in data collection but neglected in analysis. It remains to be seen how e-government research can respond appropriately to this social discourse without forfeiting scientific principles such as those of consistent definitions.

Keywords: e-government, gender, scoping literature review

1 Introduction

A wide range of research has pointed out that the development and the use of IT services are not gender neutral. Technology is “not accessed, managed and controlled by all men and women equally” [Ga21]. For example, according to the statistics agency Statista, around 83% of those employed in the IT and ICT sector in Germany are men [St22]. According to the Federal Statistical Office, only 22% of computer science students were female in the 2020/2021 winter semester [De22a]. This disparity is particularly relevant because technology has implications for society as a whole. While other industries only have a certain impact, modern technology affects the daily lives of almost everyone: among other things, it influences the nature of communication, the definition of privacy, consumer behavior, access to information, social interaction, the work environment, and the health industry [Tu22].

Governments strive to reduce gender inequalities in society, e.g., by promoting political representation or by measures designed to reduce the gender pay gap. In addition, most states are obliged to reach for the United Nation’s Sustainable Development Goals (SDGs), which includes the goal “Achieve gender equality and empower all women and girls” [Un22]. At the same time, governments are increasingly using digital channels to engage with their citizens or to optimize internal workflows. A rising number of administrative actions can be handled via information technologies. This field of action is described as e-government, which is defined as the handling of processes related to

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government and administration by means of information and communication technologies via electronic media [LR02].

In contrast to the private sector, the impact of digital services in the public sector is more significant because citizens do not have a choice – they cannot select between different providers or decide to do without a particular service. Depending on the situation, they are obliged to make a certain notification, apply for a service or pay a levy. However, citizens are not the only target group for e-government services (government to citizen, G2C), it includes government to businesses (G2B), and governments to governments (G2G), too [VBM10]. The latter includes civil servants as a target group, of whom 57.5% are female in Germany [De22b].

Governments therefore have a special responsibility when they use IT systems. They must ensure that services provided by technologies are inclusive and that people with different socio-demographic, cultural and personal characteristics have been considered. One of these personal variables that studies regularly assess in relation to the research subject is gender. In this context, it is even more surprising that research specifically focusing on the interface of e-government and gender is extremely rare [FF21; Ga21].

This paper examines how gender is currently defined and understood in e-government research. The purpose is to observe the understanding in e-government research in general, not to specifically analyze studies with gender and e-government as the object of inquiry. A scoping literature review serves as the methodological basis because it is well suited for exploratory approaches in which the aim is to classify and understand a previously little researched topic in current science. The article is structured as follows: in the next chapter, the methodological procedure is presented in more detail. The third chapter shows the results of the scoping literature review, which are discussed in the fourth chapter. The article concludes with an outlook.

2 Method

A scoping literature review has the “aim to map *rapidly* the key concepts underpinning a research area and the main sources and types of evidence available and can be undertaken as stand-alone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before” [MRP01, emphasis in original]. The present study is concerned with making visible, in a relatively short time, the current concepts or understandings of gender in e-government research – a topic that has rarely been scrutinized in depth until now. The extent to which the identified literature is analyzed in depth depends on the research question or purpose of the analysis [AO05]. A general distinction is made between four reasons why a scoping literature review is conducted:

- To assess the scope and core features of previous scientific research without necessarily presenting research results in detail;

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- To assess whether an extensive systematic literature review is worthwhile and how extensive it would be to conduct;
 - To summarize and make visible previous research results of a specific research area;
 - Building on the previous point: to identify research gaps and to draw conclusions from the scoping literature review [AO05, p. 21].

While the first two aspects can rather be understood as a preliminary stage of a systematic literature review, the last two points are to be regarded as an independent method, the results of which do not necessarily lead to a systematic literature review [AO05]. Munn et al. add that scoping literature reviews can also be conducted to perform classifications of research findings or to make methodological approaches visible for specific research subjects [Mu18]. Furthermore, they mention that the goal could be to „clarify key concepts / definitions in the literature“ [Mu18], which is the intention of the present study: Scientific contributions from the field of e-government are thereby examined according to the understanding of gender. But also, the summary of previous findings related to technical development in the public sector and gender are the subject of this paper. In this respect, the methodological approach here should not be seen as a precursor to a systematic literature review, but as a stand-alone contribution. It is also complementary to the findings of Feeney & Fusi, who, in their scoping literature review of government and gender „explore feminist theoretical approaches in technology and organizational studies and identify and describe three gender research streams“ [FF21].

Arksey & O'Malley distinguish five stages of the scoping literature review:

- „Stage 1: identifying the research question
- Stage 2: identifying relevant studies
- Stage 3: study selection
- Stage 4: charting the data
- Stage 5: collating, summarizing and reporting the results.“ [AO05]

Regarding stage 1, the research question here is not whether feminist theories are considered in the use of technology in the public sector as in Feeney & Fusi, but how gender is generally understood in e-government research and what kind of empirical evidence there is in the papers examined. To identify relevant studies, the following literature databases were searched on 07 June 2022: Scopus, ACM Digital Library, IEEE Digital Library and SpringerLink. In the search algorithm it was specified that all fields must contain one of the terms "gender women men Geschlecht Frauen Männer" and the term "egovernment". To analyze the results in depth rather than breadth, the time period was limited to all publications in 2021. This clearly reduced the number of search results. It is also important to note that SpringerLink was searched exclusively for articles and conference proceedings, thus excluding other possible literature sources from the outset.

During a first screening, false hits were sorted out. In addition, duplicates were deleted, and posts were removed from further investigation whose full version was not available. Subsequently, the contributions were evaluated according to the criteria listed in Table 1. Some contributions contained the mentioned search terms but had no relation to gender or e-government in terms of content and / or also no empirical results. In addition, there were contributions in which gender was not mentioned. Accordingly, these studies were also screened out.

Inclusion criteria	Exclusion Criteria
One of the words in the document is: "gender", "women", "men", "Geschlecht", "Frauen", "Männer"	Government Report / Statement etc.
One Word in the Document is "egovernment"	Books
Published in 2021	Paper is not available
Conference or journal paper	
Contribution contains definition, understanding, or empirical result related to gender	

Tab. 1: Inclusion and Exclusion Criteria

In the fourth step, the following information was drawn from the data: author, title, research objective, method, understanding of gender and gender-relevant outcomes. The results of these steps are summarized in the next chapter.

3 Results

Figure 1 shows the individual steps of the literature selection. Initially 272 papers were identified. After the first screening, 36 entries remained. Many of the sorted-out contributions had no relation to e-government, which was already recognizable in the title. The high number of wrong results may be due to the search word "men", as this word is part of many other words like instrument, argument, development, or acknowledgment. The term "gender" also led to incorrect results in German studies because there are some German word sequences that contain "gender." (e.g., „Fragen der“, „überegender“, „fernliegender“). In addition, the term "gender" also appeared in many papers only in the bibliography, but not in the text itself.

Subsequently, the inclusion and exclusion criteria were applied, whereupon the final number of contributions to be examined was reduced to eight. During the application of the criteria, the contributions were already viewed in more detail. It became clear that some of them contained the word "government" but had no reference to e-government. If the paper focused exclusively on smart city, healthcare, or justice, it was also sorted out.

Some of the contributions also had no reference to gender at all. Finally, studies were excluded from the analysis if they mentioned gender once, but the associated understanding was not apparent, nor were there any empirical results segregated by gender.

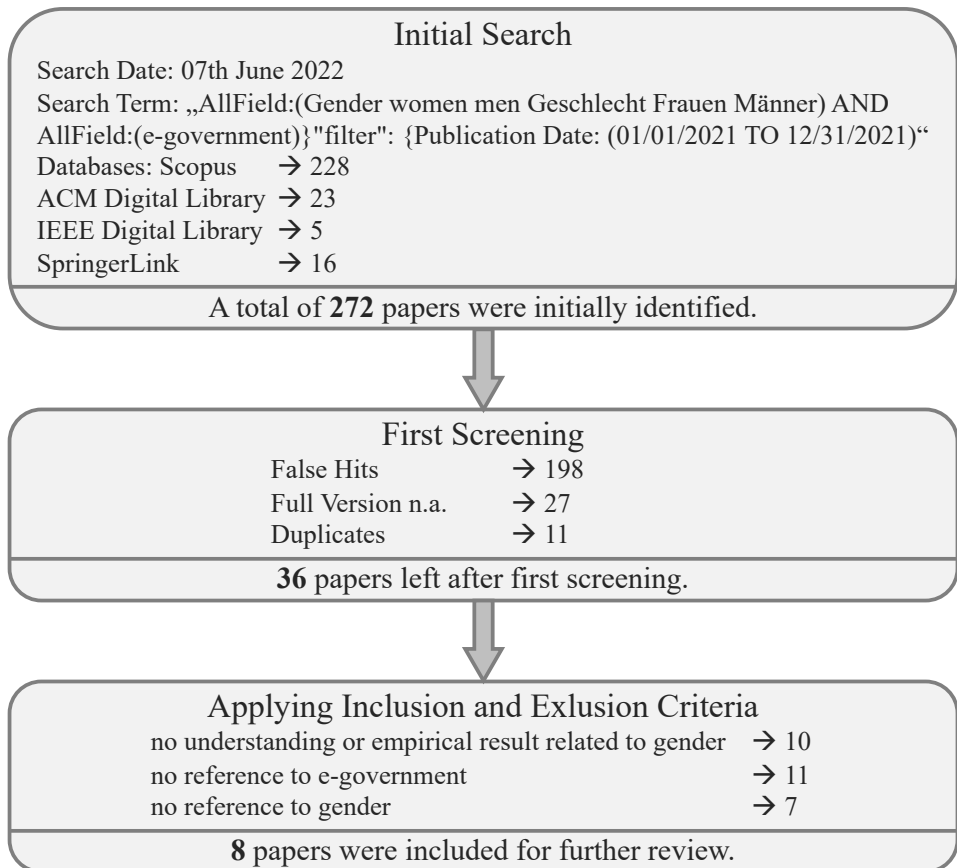


Fig. 1: Overview of the Paper Selection Process

In the next step (Stage 3: study selection, see Chapter 2), the studies were reviewed in detail. Information was then collected on the authors, the title and the research objective, the method, the understanding of gender, and gender-relevant findings. According to Stage 4 (charting the data, see Chapter 2), these information of the remaining eight studies is illustrated in Table 2.

Author & Title	Research Objective	Method	Understanding of Gender	Gender-relevant Findings
<i>Alarabiat et al.:</i> The suitability of Facebook as a digital platform for constantly perform e-Participation activities	Does Facebook provide all the necessary functions and features to enable citizens to engage in all levels of e-participation?	task technology fit theory, data obtained by survey (N = 211)	binary variable	none
<i>Almuraqab & Jasimuddin:</i> An Empirical Study of Perception of the End-User on the Acceptance of Smart Government Service in the UAE	What factors influence the end-user acceptance of smart-government services?	partial least squares structural equation modelling (PLS-SEM), data obtained by survey (N = 273)	binary variable	Gender influences the effort expectancy; it has an impact on the relationship between facilitating conditions as well as trust in government and the use of smart government.
<i>Andersson et al.:</i> Citizen Diversity in eGovernment Research	How is diversity addressed in e-government research?	literature review based on Webster & Watson (2002)	not explicitly stated	From 55 examined papers, 3 focus on gender, two of them suggest no effect of gender on the use of e-government services; none of the papers included other gender than female and male.
<i>Botrić & Božić:</i> The digital divide and E-government in	What factors of digital divide influence the non-adoption of e-government in	analysis based on Eurostat Community Statistics on Information	binary variable	Older women are likely to not adopt e-government services. No effects of gender

Author & Title	Research Objective	Method	Understanding of Gender	Gender-relevant Findings
European economies	European states?	Society (CSIS) micro data		were found for younger persons.
<i>Janita & Miranda:</i> Exploring critical dimensions for measuring service quality in government to employee	What are the essential characteristics that a university service portal must have to be rated with high quality by employees?	qualitative study (Delphi method); quantitative study (academics from Spanish universities)	binary variable	none
<i>Pietilä et al.:</i> Understanding the youth's user needs for inclusive eParticipation	What are the needs of young people in terms of eparticipation services?	data obtained by workshops: semi-structured group interviews, recording of discussions, and a survey	possibility for participants not to specify their own gender	none
<i>Prokop & Tepe:</i> Talk or type? The effect of digital interfaces on citizens' satisfaction with standardized public service	How does it affect citizen satisfaction when face-to-face interaction is replaced by digital interfaces?	vignette experiment conducted on a sample of German citizens (N = 1.234)	binary variable	Women are slightly more sensitive to technical errors; they are more satisfied with successful service delivery than men; they are also less satisfied when there are service failures without explanation.
<i>Wessel et al.:</i> WCAG and Dyslexia – Improving the	Are requirements of users with dyslexia	development of modifications by literature	third gender available	none

Author & Title	Research Objective	Method	Understanding of Gender	Gender-relevant Findings
Search Function of Websites for Users With Dyslexia (Without Making It Worse for Everyone Else)	covered by the Web Content Accessibility Guidelines? How can usability be improved for these users?	review and interviews, evaluated by an online survey	called diverse	

Tab. 2: Charting the Selected Papers

In five of the eight posts analyzed, gender was recorded as a binary variable, in one study participants had the option not to specify their own gender, in one post the understanding of gender was not explicitly included, and in one study there was an option for participants to specify "diverse" when asked about their gender. None of the papers address or question current debates about gender; in the majority (five of the eight contributions), the classic binary division is used as a matter of course. In addition, there is another interesting observation: although the variable gender is frequently collected in empirical studies (for example, in surveys or in interviews), this variable is often not considered during further analysis of the results. This is also the case for half of the studies reviewed here. For the four papers where gender-relevant results were found in the analysis, the influence of gender on the research question varied from significant to no influence.

4 Discussion

In accordance with the methodological requirements of a scoping literature review, only a small selection of e-government publications in which gender plays a role could be analyzed in this study. In particular, the restricted time period reduces the total number of studies. Nevertheless, one gets a first impression of the understanding of gender in the respective contributions. For the most part, a binary understanding of gender is assumed. In addition, gender is often asked during data collection but not included in the analysis. However, it has also been shown that there are studies that deviate from this standard. In one study, for example, there was the option of specifying "diverse" as the gender, while in another it was possible not to specify any further information on this. Thus, there is no consistent understanding of gender. On the one hand, this reflects the topicality of the social debate. For in social discourse, too, various positions regarding gender are currently being discussed without any particular view having prevailed. At the same time, a central aspect of scientific work is comparability and traceability, which is made possible, among other things, by consistent definitions. But how can studies be compared if in some there

are two, in others three or more expressions of the variable gender? From this point of view, science has to perform a balancing act in which current social discourses around gender are taken into account, but at the same time the comparability and consistency of definitions is not jeopardized.

5 Outlook

Building on the findings of this work, one could now examine, for example, the extent to which concepts such as *I-methodology* are applied in e-government research and relating technology development. *I-methodology* can be described as the “reliance on personal experience, whereby the designer replaces his professional hat by that of the layman” [Ak95]. In this kind of development process, the artifacts usually demonstrably meet only the requirements of the developers and designers [ORS04]. If this group is not representative of society, the productive systems are only tailor-made for certain people who are similar to the developing persons.

The public sector is also responding to the social discourse around gender. This becomes clear, for example, in new options such as "diverse" or in gender-appropriate language in official documents. It would be interesting to either examine government documents in the form of a scoping literature review or to comparatively analyze artifacts of the public sector with those of academia in terms of their treatment of gender. Finally, how bias is dealt with in technical systems in the public sector and what influence this has on gender could also be investigated.

6 Literature

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