

Editorial

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E-Government and Smart Cities

A Call for an Interdisciplinary Perspective

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1 Motivation

The widespread adoption of online services, mobile and pervasive computing, and social media in everyday life has changed citizens' attitudes and expectations towards governments, citizen participation, and the efficiency of public administration. Especially during times of crisis such as the COVID-19 pandemic or the catastrophic flooding in western Europe in July 2021, citizens rightfully expect governments and public services to fully exploit the possibilities of digital media to protect and improve lives, e. g., by better-informed decision making, smarter and data-driven responses, and more efficient processes.

Unfortunately, as press coverage reveals for example in Germany, the reality seems often distant from these expectations: Websites for booking COVID-19 vaccinations are deemed unusable,¹ daily data exchange between regional and national health authorities sometimes still happens paper-based,² and civil protection apps that should warn about catastrophic floods turn out to be unreliable in practice.³

It would not be justified to blame governments or technology providers for the public sector that they simply ignore or regularly fail at digital technologies. In light of new technological opportunities and challenges, public administrations are indeed expanding their digital services in all fields of action. This includes classic e-government

services, such as applications for social benefits or building permits, but also solutions in the context of smart cities, urban sensing, and connected rural communities that rely on active participation, communication, and cooperation among citizens. Ideally, such new technologies will eventually help citizens and civil servants to become efficient users of government services, consentful providers and informed users of government or city data, participants of a constructive discourse, and well-informed decision-makers.

2 Challenges of E-Government and Smart Cities

In practice, such goals are difficult to meet due to frequent problems with the acceptance, availability, usability, and practical usefulness of new digital technologies in these highly complex application domains. The relationship between citizens and public administrations has very specific characteristics that are different from commercial services or products. Public services have a very profound impact on the life of individuals and society. While typical human-centered goals for the design and implementation of digital systems such as *usability* and *user experience* (as defined in ISO 9241-210⁴) are not fundamentally different for the public sector compared to other areas, there are existential and complex dependencies when it comes to providing security and order, protection, and welfare. For example, there is no freedom of choice for citizens about their "service provider", i. e., national, regional, or local governments, and this absence of choice together with the government's obligation to ensure equal access by all citizens makes design innovations sensitive and sometimes controversial.

On the other hand, public administrations are also accountable to citizens. The relationships between residents or citizens and government organizations are therefore multifaceted: administrations provide social services,

¹ <https://www.zeit.de/digital/2021-03/impftermin-corona-impfung-anmeldung-impfplattform-faq> (last accessed July 20, 2021).

² https://rp-online.de/nrw/staedte/leichlingen/leichlingen-darum-hakt-es-bei-den-corona-zahlen_aid-57835077 (last accessed July 20, 2021).

³ <https://www.zdf.de/nachrichten/digitales/hochwasser-warn-app-notruf-nina-katwarn-100.html> (last accessed July 20, 2021).

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⁴ <https://www.iso.org/standard/77520.html> (last accessed July 21, 2021).

collect taxes and fees, monitor compliance with laws and regulations, and develop ideas and solutions for the community together with residents and other stakeholders as part of participatory processes. These relationships place specific demands on interaction and the digital and non-digital tools used. Moreover, no one may be excluded from these relations. Government services, offers, and processes must in principle be accessible to everyone. A focus on specific target groups is not possible.

Particular drivers of e-government progress are targets set through legislation. In the European Union, various directives demand rapid progress in digitization, for example, the Single Digital Gateway Regulation (REGULATION (EU) 2018/1724⁵), which prescribes uniform access for certain e-government services – even across borders. *Usability* and *comprehensibility* are mentioned there as quality requirements. In Germany, a comparable law (Online Access Act, Gesetz zur Verbesserung des Onlinezugangs zu Verwaltungsleistungen⁶) requires that all suitable administrative services (almost 600 services) must be accessible online by the end of 2022. However, usability plays a subordinate role in this law. The only requirement is the so-called *barrier-free access (accessibility)* without changing the medium used, for example from online forms to paper.

Nevertheless, usability and user-centered design are increasingly considered in e-government initiatives and projects. Within the implementation of the Online Access Act, so-called laboratories for user integration were carried out for individual administrative services. However, the arising problem is that user wishes, legal frameworks, and the organizational perspective are difficult to reconcile. Similarly, a further challenge that is particularly relevant in the context of Smart Cities is reconciling the *top-down* development and deployment of corporate technologies based on government needs with inviting *bottom-up* innovation by startups, citizen-led initiatives, or civic hackers who rely open standards to make use of technological platforms and urban data repositories [1].

3 The Need for an Interdisciplinary Perspective

E-government and Smart Cities are addressed by various disciplines, including business and administrative in-

⁵ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.295.01.0001.01.ENG (last accessed July 21, 2021).

⁶ <https://www.onlinezugangsgesetz.de/> (last accessed July 21, 2021).

formatics (information systems), computer science and human-computer interaction (HCI), and legal and administrative science – to name only the most prominent examples. Other disciplines are similarly active in the domain, e. g., psychology, sociology, or urban planning.

With their different focal points, these disciplines enable a holistic research perspective: The HCI community makes important contributions to usable systems and user-oriented e-government. The information systems research perspective focuses rather on processes and systems and strives for improvements through reorganization and digitization. Administrative science develops reform approaches. Legal science deals with the regulatory framework for digitization and the suitability of laws for digitization. Even though more and more interdisciplinary research groups are active in the e-government field, there is still a lack of holistic concepts and methods covering this topical breadth.

Research on reconciling these perspectives and focus, especially by developing specific models and methods – also against the background of the above-mentioned conditions in the public sector – therefore seems urgently needed. There is also a great demand for such research results from the perspective of practice. Usability and user experience must become key goals for system design in public sector digitization projects. Because of extreme time pressure (time limits given by laws and directives) and very scarce resources, especially concerning IT experts and available service providers, such human-centered qualities are too often given low priority in public procurement and projects.

4 About This Special Issue

In this Special Issue, authors present their work in the context of e-government with a focus on human-centered design that focuses on the needs of citizens. Christopher Getschmann and Florian Echtler address data acquisition in the context of Citizen Science in their contribution. They present the app DesPat, which collects camera-based pedestrian tracking data and also takes into account the special requirements for data protection by analyzing the collected images solely locally. This solution can be used in particular for smart city applications in the field of mobility.

Maas et al. deal with a completely different form of citizen involvement. They present an empirical study on citizen-centricity in the early design phase for participation tools. On this basis, participation identities and cit-

izen needs are identified. Based on existing tools, they show how these needs can be addressed.

The third contribution by Wessel et al. builds a bridge between Smart City data and citizen participation. The focus is on increasing resilience to floods through the use of sensor data and personalized information. This article presents the human-centered development process of a Smart City application in the context of disasters. Against the backdrop of the flood disaster in western Germany at the time this editorial was written, the article is tragically topical.

Egert et al. on the topic of smart grid resilience also address participation in the smart city context. They explore socio-technical challenges that arise from the involvement of citizens as providers and consumers of electricity. The authors discuss motivational strategies and tools, including nudging, persuasive technologies, and incentives, as well as ethical and data protection considerations.

5 Outlook

In the area of user-centered design and e-government, the focus is often on citizen-centered applications – also apparent in this Special Issue. In future, employees in public administrations should be given more attention. There is a great potential to be leveraged here. This field benefits particularly from holistic methods and findings on human-centered reorganization and digital transformation of the public sector. Therefore, we argue for more interdisciplinary research developing overarching concepts and methods for this particular aspect.

References

- [1] Townsend, A. (2013). *Smart Cities – Big Data, Civic Hackers, and the Quest for a New Utopia*. New York | London: W. W. Norton & Company.

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