



Smart advisors in the front office: Designing employee-empowering and citizen-centric services



Tobias Giesbrecht^{a,*}, Hans Jochen Scholl^b, Gerhard Schwabe^a

^a University of Zurich, Binzmühlestrasse 14, Zurich CH-8050, Switzerland

^b University of Washington, The Information School, Box 3528, Mary Gates Hall, Ste 370, Seattle, WA 98159-2840, USA

ARTICLE INFO

Article history:

Received 27 February 2015

Received in revised form 18 May 2016

Accepted 22 May 2016

Available online 1 September 2016

Keywords:

Advisory information artifact

Government front offices

Citizen-centric advisory services

Affordances

thinkLets

ABSTRACT

Civil servants in government front offices frequently lack subject matter expertise as well as necessary skills to meet modern citizen-centric service demands. Using design research, we discuss how front offices can change the service paradigm from administering government-centric and transaction-oriented services to providing truly citizen-centric services. We demonstrate that by means of “advisory information artifacts” civil servants can become expert advisors and eventually provide citizens with superior advisory services. Advisory information artifacts consist of a knowledge base, “counseling affordances” offering advisors moderation material and “service encounter thinkLets” covering the corresponding work practices. Such advisory information artifacts have the capacity to effectively support civil servants in acquiring the necessary advice-related skills while concurrently providing superior citizen-oriented services.

© 2016 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction, research problem, and research question

A core task for local governments is to provide citizens with front office services and advice (Bogumil & Jann, 2008; Lenk, Brüggemeier, Hehmann, & Willms, 1990). However, civil servants in government front offices frequently lack both the subject matter expertise and the skills necessary to provide modern citizen-centric services. Therefore, we propose to redesign government front office services, with an emphasis on using modern information technology to provide citizen-centric advice and services. This article presents an empirically derived “proof of concept” for a technology-supported approach that combines both civil servant (or government employee) empowerment and a citizen-focused orientation that is centered on citizens' needs and wants. In this way, our work contributes to addressing the widely acknowledged need for government service modernization and a re-orientation toward citizens' needs.

In the remainder of the introduction we define and characterize the research problem by introducing and reviewing the existing relevant literature. This leads to our specific research question about how to improve government front office services. Next, we review other related literature in more detail. The subsequent methodology section introduces action design research (Sein, Henfridsson, Purao, Rossi, & Lindgren, 2011) as an appropriate approach to derive a socio-technical solution. In keeping with the design research approach (Peffers,

Tuunanen, Rothenberger, & Chatterjee, 2007), we include a second set of literature directed toward the proposed and empirically tested solution. Next, we detail the findings from using an action-design approach in practice. Based on these findings, we then discuss the design and implications of “advisory information artifacts,” their role in front office service redesign, and the effectiveness of the empirically tested approach, with regard to both employee empowerment and citizen orientation. Finally, we discuss how advisory information artifacts have the capacity to play important roles in front office service redesign along both the avenues of citizen focus and employee empowerment.

1.1. The research problem as presented in the current literature

Nowadays citizens perceive themselves as clients of, rather than as petitioners to, the government, which has changed their expectations on service delivery and service quality (Schedler & Proeller, 2000). Also, citizens compare contemporary services provided in the public sector to private-sector services and expect to find concepts such as “customer orientation” or “one face to the customer” in government services. For example, when personal life circumstances change, such as moving to a different jurisdiction, a citizen expects to receive sound and comprehensive information and advice from local government civil servants about local taxes, public benefits, and public health services. Current practices, however, usually have citizens passed from one government department to another until finally the service requests are completed or government requirements are met (Bannister & Conolly, 2013; Schedler & Proeller, 2000; Schenk & Schwabe, 2011). Since individual departments are mostly still contained to specific

* Corresponding author.

E-mail addresses: giesbrecht@ifl.uzh.ch (T. Giesbrecht), jscholl@uw.edu (H.J. Scholl), schwabe@ifl.uzh.ch (G. Schwabe).

subject matters, they rarely are able to provide the comprehensive advisory services that citizens expect.

In response, local governments have started to rethink their service offerings with the aim of mitigating the effects of the siloed back office structure. By developing and introducing novel information and communication technologies (ICT), local governments established integrated knowledge bases and online services, providing constituents with information at a variety of levels (Ketabchi & Mortazavi, 2009; Kubicek & Hagen, 2000; Layne & Lee, 2001; Reffat, 2003; Todevski, Janeska-Sarkanjac, & Trajanov, 2013; Torres, Pina, & Acerete, 2005; United Nations & Department of Economic and Social Affairs, 2014; Wimmer, 2002). However, while citizens can satisfy simple information needs or conduct standard transactions, more complex requests or requirements can rarely be resolved easily (Giesbrecht, Schenk, & Schwabe, 2014). When life circumstances change, citizens may require comprehensive personal advice. Yet, in such situations citizens may not be able to identify or express their actual information needs (also called the *anomalous state of knowledge*) (Belkin, Oddy, & Brooks, 1982). Accordingly, without knowing what to look or search for, citizens are unable to make good use of online government information or self-service portals. Instead they often require a human advisor to act as an intermediary to help uncover their actual needs and requirements. This process then allows citizens to identify and access the appropriate government services and procedures.

As a result, citizens seek face-to-face advice in government front offices (also known as “neighborhood service centers,” “Bürgerbüros,” or “citizen advice bureaus”) (Lenk, 1998, 2002). Those contact points implement the organizational concept of “one-stop-government” (Kubicek & Hagen, 2000), providing citizens with integrated access to a variety of diverse public agencies (Askim, Fimreite, Moseley, & Pedersen, 2011). Given that a fundamental reorganization of the public sector (“de-siloization”) is difficult, one-stop shops provide an integrating layer on top of traditional silo organizations (Bannister & Conolly, 2013). Citizens’ life events may require “parallel one-stop-shops,” e.g., services that coordinate several formally independent actions (Bannister & Conolly, 2013). In consequence, these one-stop shops have to understand a citizen’s complex life situation and map it to the equally, if not more, complex public “silo-organization”. However, contemporary front offices are rarely prepared to provide such tailored advisory services; the work environment and work culture are structured toward processing requests from citizens as petitioners (Lenk & Klee-Kruse, 2000; Schenk & Schwabe, 2011), for example, when applying for public benefits. Fig. 1.1 depicts the physical situation of today’s citizen service encounters in government front offices: The public employee or civil servant serves as an administrator primarily qualified to process pre-defined transactions (on the left in Fig. 1.1), and acts as grantor of the citizen’s requests as petitioner (on the right side). The physical organization of front office workspace positions the employee and the citizen on opposite sides of the counter or table (cf. rectangle in the middle of Fig. 1.1). In this configuration, the office is designed for fast processing rather than collaboration between equals (Giesbrecht, Schenk, & Schwabe, 2015b; Giesbrecht, Schmidt-Rauch, & Schwabe, 2011). These service objectives may be enforced by the information artifacts used in the service encounter. Moreover, the one-sided informational support from the back office, primarily accessible only to the civil servant in the front office (cf. wavy lines in Fig. 1.1) may also promote transaction-oriented work processes.

1.2. Research question

Current research extensively discusses the need for changing the service paradigm in local government back and front offices from a traditional transaction orientation to a citizen-centric service orientation (cf. Davison, Wagner, & Ma, 2005; Irani, Elliman, & Jackson, 2007; King & Cotterill, 2007; Weerakkody, Dhillon, Dwivedi, & Currie, 2008). The literature describes the basic aspects, challenges, and key factors

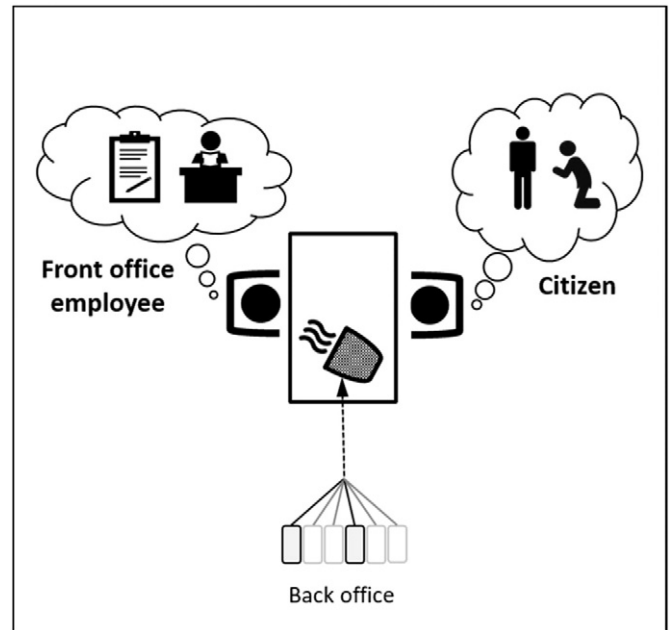


Fig. 1.1. Physical situation in today’s citizen service encounters in government front offices: front office employee as administrator (left), citizen as petitioner (right), available IT system providing information to the employee (on the table).

(Weerakkody et al., 2008; Weerakkody, Janssen, & Dwivedi, 2011), or impediments (van Veenstra, Klievink, & Janssen, 2011) influencing change in this environment, such as the lack of leadership, civil servants’ resistance to change, lack of coordination and collaboration, or a siloed organizational structure. However, recent studies mostly focus on the improvement of online services and rarely consider the physical front offices as important areas of service overhaul. As a result, the physical workspace, as well as the civil servants and their work-related capabilities, have been left understudied.

Civil servants in the front offices are advice-seeking citizens’ first and main contact to resolve their government-related issues. Accordingly, their advising skills and work performances play a crucial role in transforming front office services, namely changing from providing transaction-oriented processing to offering actual advisory services. Employees in the front offices of private service organizations, such as travel agencies, or in the front offices of government departments that offer explicit advisory services, such as social welfare or tax offices, are often given training in providing these advisory services. However, civil servants in front offices frequently lack the necessary qualifications for this type of work (cf. related work section for details). Civil servants in front offices usually begin their government employment doing back office administrative tasks, and are then transferred into the front offices. As a consequence, they often just possess knowledge about the specific government department which they originated with (Lenk & Klee-Kruse, 2000; Schenk & Schwabe, 2011) and thus lack the necessary cross-departmental overview of the government information and services provided to citizens.

Furthermore, organizational support for coping with the local governments’ increasing offers of integrated services is often lacking (Schenk & Schwabe, 2011). That is, employees are rarely provided with customized support (Lenk & Klee-Kruse, 2000) or rarely have the necessary resources for additional training (time for off-the-job trainings, money for teaching staff) (Lenk & Schuppan, 2011; Valenduc, Vendramin, Krings, & Nierling, 2007). Having employees who are knowledgeable and up-to-date in the best practices of their field is a fundamental necessity for supporting or enabling organizational change; many studies have shown the negative effects of employees’ lack of skills (van Veenstra et al., 2011; Weerakkody, El-Haddadeh, Sabol, Ghoneim, & Dzapka, 2012; Weerakkody et al., 2008). In this

way, the comprehensiveness and quality of the advisory services provided by contemporary front offices depends on the greatly varying capabilities of individual employees, often causing citizens to be dissatisfied with the front office services provided (Accenture, 2005; Fountain, 2001; Schedler & Proeller, 2000; United Nations & Department of Economic and Social Affairs, 2014).

This leads to the research question: *How can civil servants in government front offices be empowered to offer citizen-centric advisory services?*

Citizen centric advisory services focus on the real needs of clients, both in the process and the outcome of the advisory service encounter.

2. Related literature: services, qualifications, and information artifacts in local-government front offices

In the organizational environment of government front offices, civil servants need suitable support to acquire and apply the skills necessary for providing truly citizen-centric advisory services, where communicative and interpersonal skills may have higher importance than specialist knowledge on particular governmental topics (Lenk, 1998; Schuppan, 2010; Valenduc et al., 2007).

Providing strong citizen advisory services requires local government front offices to provide a conducive work environment and suitably qualified service personnel. The next sub-section provides some background regarding these aspects and points to the research and practice gaps of current approaches.

2.1. Service provisions in government front offices and the necessity for change

The focus of this study lies in the face-to-face citizen advisory services provided by local governments, where citizens seek advice from civil servants to address changing life circumstances, for example expecting a child or moving to another municipality. Citizens requesting such services have complex information needs. Nowadays, in neighborhood centers and through front offices, governments offer citizen services that require personal appearances, such as residency registration or passport renewal (Lenk & Klee-Kruse, 2000). In these transactions citizens appear more like petitioners, while government employees act as grantors and administrators who process the transactions or provide guidance (cf. Fig. 1.1.). Consequently, front office workspaces and their information systems are designed to enable and process transactions (Schenk, 2014) with a focus on government requirements and effective processing (cf. Fig. 1.1) rather than the citizen-centric, advisory, and comprehensive service delivery model (Giesbrecht et al., 2014) that modern governments are expected to establish (Denhardt & Denhardt, 2000; Lenk, 2002; Schedler & Proeller, 2000; Schuppan & Reichard, 2002; Weerakkody et al., 2008).

Consequently, citizens are frequently dissatisfied with the services provided at the physical front offices (Accenture, 2005; Fountain, 2001; Schedler & Proeller, 2000; United Nations & Department of Economic and Social Affairs, 2014); visits to physical government offices frequently lead into a long march from one government department to the next before the citizen's service request is ultimately completed (Schedler & Proeller, 2000). Providing services in the public sector is more complex and demanding than in the private sector. Public agencies offer services that are far more numerous and diverse than services provided by any private company (Algermissen, Delfmann, & Niehaves, 2005). Complex legal rules and regulations furthermore increase the complexity of public services. On the other hand, the strict rule-based nature of bureaucratic organizations reduces the principal-agency conflict that characterizes sales-oriented services, such as banks (Nussbaumer & Matter, 2011) or travel agencies (Novak, 2009). Overall, citizens approach public agencies with more trust.

For some time, it has been advocated that local governments should change their front office service paradigm and adopt work processes and structures that provide truly citizen-centric and advisory services

rather than administration-centric and transactional services (Davison et al., 2005; King & Cotterill, 2007; van Veenstra et al., 2011; Weerakkody et al., 2008, 2011). Extensive changes in processes and structures are considered necessary to enable e-Government initiatives to take full effect and advantage of the benefits of ICT-supported work practices (Gregor, Martin, Fernandez, Stern, & Vitale, 2006; van Veenstra et al., 2011). Process changes in local government back and front offices have been described as mechanisms to establish citizen-centric services (Gupta & Jana, 2003; King & Cotterill, 2007; Scholl, 2005a, 2005b; Scholl, Kubicek, Cimander, & Klischewski, 2012; van Veenstra et al., 2011; Weerakkody et al., 2008). Weerakkody et al. (2008), for instance, describe many of the key factors influencing change, including offering training incentives, supporting change efforts, seeing IT as an enabler of citizen-centric services, and breaking down the silo mentality within local authorities. However, civil servants are less motivated by monetary or other extrinsic rewards than their private counterparts (see Anderfuhren-Biget, Varone, Giauque, & Ritz, 2010). Van Veenstra et al. (2011) highlight impediments for successful changes, for example a lack of IT skills or lack of coordination and collaboration.

Other e-Government research has emphasized the government employee perspectives on service designs (Akesson & Edvardsson, 2008) or the citizen perspectives (Lee & Lee, 2014; Liu, Gavino, & Pura, 2014; van Velsen, van der Geest, ter Hedde, & Derks, 2009). Also, infrastructural considerations for public service design and delivery have been investigated (de Reuver, Stein, & Hampe, 2013; Kuk & Janssen, 2013) along with frameworks for government-to-citizen collaboration in service design (Apostolou, Mentzas, Stojanovic, Thoensen, & Lobo, 2011). However, current research approaches mostly focus on changes geared at improving online service delivery, and rarely provide practical insights on how front offices can provide citizen-centric services. The important role of civil servants and their individual skills and abilities when providing services to the public, as well as the role of the service environment itself have so far been mostly neglected in research.

2.2. Necessary skill sets for providing true advisory services

In changing personal life situations, such as moving to a new municipality, citizens must learn about available governmental services, such as public schools, parking permits, or public benefits. Accordingly, civil servants in the front office are confronted with a multitude of potential service requests, which they have to understand and be able to support. Furthermore, the problem space which confronts citizens can be rather diffuse. As a consequence, mapping a citizen's problem space onto suitable solutions, that is, matching available government information and services to needs, can be demanding. Civil servants in the front office can only rely on little (if any) support beyond their verbal dialog. Thus, communication and interpersonal skills gain importance, and employees' social skills and their understanding of interrelations and connections becomes even more essential than their expert knowledge regarding specific government services (Lenk & Klee-Kruse, 2000).

In these face-to-face service encounters, civil servants in the front offices need to expand their set of skills, moving from being administrators processing standard transactions to advisors providing comprehensive advisory services. Originating in psychology, advisory services' principle objective is to enable advice-seeking clients to resolve their problems on their own (Schwartz & Posse, 1986; Warschburger, 2009) by providing the clients with sufficient decision guidance. In an advisory service encounter, advisors and clients must each provide information based on their area of expertise and actively collaborate together to develop solutions (the advisor's area of expertise) that suit the client's problems (the client's area of expertise). Thus, advisors and clients follow a distinct problem-solving process (cf. Giesbrecht, Schmidt-Rauch, & Schwabe, 2011; Lenk, 1998; Mutzeck, 2008; Schenk & Schwabe, 2011; Schmidt-Rauch & Nussbaumer, 2011; Simon et al., 1987) consisting of a fact-finding intelligence phase, a design phase,

and a choice phase. In the initial intelligence phase (also referred to as the *needs elicitation phase*), advisors and clients explore together the clients' problems and needs in order to create a thorough understanding of the client's situation. In the subsequent design and choice phases (the latter also called the *solution-finding phase*), advisors make suitable use of available tools and information resources to search for solutions for each problem and then hand the solutions over to their clients.

A number of researchers have recognized and discussed the skills required that employees working in public front offices need to provide true advisory services to citizens (c.f., Giesbrecht et al., 2014; Lenk, 1998, 2002; Lenk & Klee-Kruse, 2000; Lenk & Schuppan, 2011; Schenk & Schwabe, 2011; Valencuc et al., 2007). Though the descriptions of the necessary skills has some variation, the research converges with regard to facilitation and mediation skills, which civil servants in the front offices must be proficient in when providing citizen-centric services. Specifically, civil servants in the front offices must possess the necessary professional and methodological knowledge, as well as the social and personal skills to (i) guide their clients through a structured problem process, (ii) suitably apply available tools and information resources within this process, and (iii) establish and maintain a close relationship to the clients (Giesbrecht et al., 2015a).

2.3. Why civil servants in the front offices still lack the necessary skills

Different studies show that employees in government front offices frequently lack the necessary skills to provide an appropriate level of citizen-centric advisory service (cf. Andersen, 2006; Giesbrecht et al., 2011; Hielscher & Ochs, 2009; Schenk & Schwabe, 2011). As reported in Giesbrecht et al. (2015a), civil servants in front offices show distinct deficiencies in their current work practices: (i) Instead of guiding the client through a structured process, they merely respond to clients' direct questions. Thereby, they pass the conversational lead to the clients and have substantially less control about the service encounter and its outcome; (ii): Civil servants in the front office currently underutilize available information resources, both paper-based and electronic. They merely hand over standard information; for example giving out standardized leaflets or brochures to citizens rather than providing tailored information or explaining procedures to citizens. As a consequence, standardized information resources act as a communication barrier between civil servants in the front offices and citizens, and compromising the service quality. In most instances government employees limit their communications and interactions with citizens to collecting the specific request at the beginning of the service encounter and then providing citizens with information on the solution at the end of the encounter; they rarely interact with the advice- and service-seeking citizen while processing the request and searching for information on suitable solutions.

Providing citizen-centric advisory services requires government employees to master a multitude of additional skills beyond those required when working as administrators simply processing transactions. However, civil servants in the front office are rarely prepared for this more comprehensive set of tasks. They typically are educated as specialists and have worked in specialized departments. Their vocational training primarily focuses on transferring legal knowledge and proficiency in administrative processes; developing social skills or citizen-centric work behaviors is often lacking (Kaiser, 2004; Lenk & Klee-Kruse, 2000). Furthermore, in daily routine work, organizational support to cope with the extended service tasks is missing (Lenk & Klee-Kruse, 2000; Schenk & Schwabe, 2011). Training resources are restricted, as time for professional development training is lacking, funding for qualified instructors is inadequate (Kaiser, 2004; Lenk & Schuppan, 2011), and instructional methods such as mentoring, shadowing, or other learning-from-others approaches are found ill-suited for communicating novel work practices (Giesbrecht et al., 2014). Consequently, government employees, when assigned to serve in front offices, rarely possess the skills necessary for providing quality advisory services and rarely have the opportunity to

develop them on the job. While research has uncovered and addressed several educational deficiencies (Kaiser, 2004; Lenk & Klee-Kruse, 2000) and has also outlined the basic skills which government employees in a modernized public administration should possess (Hummel & Krcmar, 2003; Leitner, 2006; Schenk & Schwabe, 2011; Schuppan, 2010), few practical suggestions have been made on how civil servants in the front office could actually develop these skills.

Public employees are often transferred from their back office workplaces into front offices without any additional training (Lenk & Klee-Kruse, 2000; Schenk & Schwabe, 2011). As a result, they are mostly accustomed to back office work practices with structured processing of specific requests within a particular government department. Thus, these employees lack expertise in providing effective front office services; citizen-centered advising is often less structured and requires employees to learn and master certain communication and interpersonal skills not required for the well-structured administrative tasks of the back office. Assuming and "living" a front office service-oriented mentality and accepting the role as an advisor to the public is further complicated and undermined by employees' perception of front-office activities being lower in value and ranking than back office activities (Weerakkody et al., 2011).

2.4. The role of information artifacts in service provision

For some time, commercial service providers have pioneered the use of, in particular, mobile information artifacts such as electronic notepads, light laptops, and other mobile devices with specialized applications to assist in providing services and sales (Balasubraman, Peterson, & Jarvenpaa, 2002; Belardini, 2013; Shankar, Venkatesh, Hofacker, & Naik, 2010). In information science the concept of an "information artifact" has been introduced as a summary term, which encompasses "both sources and pieces of information as well as information systems and other information technology artifacts" (Scholl & Carlson, 2012, p. 141). The concept accounts for the fact that "information" as a context-dependent entity that provides meaning in the eyes of a beholder and the technology which carries and contains this information can no longer sharply be distinguished from each other. For example, an XML document may contain executable code, which is both human-readable and understandable (providing information about the logics and operational behaviors) and executable (actually performing operations), which in turn may give access to and provide information to users in a run-time environment. In this way, an information artifact encompasses modern technology-based carriers and non-static providers of information such as web pages, mobile applications, and other electronic vehicles, which provide content and meaning along with their respective technology instantiations. At the same time, an information artifact is also represented by traditional media such as printed newspapers, pamphlets, and books, although these occur in static and non-malleable instantiations. The definition of an information artifact, hence, is more inclusive with regards to context and content than the related term of "information technology artifact" (also referred to as an *IT artifact*), which is used in the information systems research literature and emphasizes the technology perspective. Furthermore, from a design standpoint the concept of an information artifact is reflective and supportive of the specific knowledge and situatedness of work practices and processes in the front office.

In sum, the term *information artifact* "recognizes the fact that information in its various forms and formats and its technology instantiation on the various levels can no longer meaningfully be distinguished" (Scholl & Carlson, 2012, p. 141; see also Scholl, Eisenberg, Dirks, & Carlson T.S., 2011). Information artifacts, mobile or stationary, might have the capacity to effectively assist in government service provision (Giesbrecht et al., 2014; Schenk & Schwabe, 2011). In particular, the aforementioned lack of skills on part of government employees when servicing citizens might be an area where information artifacts can play an important assistive role (Giesbrecht et al., 2014).

In this paper, we address these research gaps and want to show how government front offices can transform to offering comprehensive citizen-centric advisory services and more specifically how employees in government front offices can be instructed and supported to consistently provide high-quality and comprehensive advisory services.

3. Methodology

Design studies that seek a proof of concept have frequently used action research for iteratively improving designs based on feedback from practice and use (Hevner, March, Park, & Ram, 2004; Peffers et al., 2007). An action design research approach was also used in this design study. Sein et al. (2011) describe the individual activities that an action design research project comprises: (i) problem formulation, (ii) building, intervention and evaluation, (iii) reflection and learning, and (iv) formalization of learning. This approach promotes a close partnership between researchers and practitioners, and it was well suited to our research environment of working in close collaboration with the local government of a major German city. With our research, we also wanted to respond to Van de Ven and Johnson's call to "not only enhance the relevance of research for practice but also contribute significantly to advancing research knowledge" (Van de Ven & Johnson, 2006, p. 802). Action design research (or action research with a design focus) is frequently applied in e-Government research (cf. Gong & Janssen, 2012; Papas, O'Keefe, & Seltsikas, 2012; Saebø, Flak, & Sein, 2011; Saebø, Rose, & Skiftenes Flak, 2008). In order to gain deeper insights into the effects of ICT on work practices in government, researchers following an action design research approach can extend their observational role within a case study by introducing a specific intervention and then observing its effects. Thus action design research is an appropriate approach when the goal of the research is to develop a socio-technical innovation (i.e., an innovation that has tightly interlinked technical, human, and organizational aspects) to solve a set of problems. In our case, we selected the major German city because the local leadership had already implemented an advanced citizens' advice bureau and had prioritized continuing to improve the service delivery and design. Our stages of action design research were as follows:

Problem specification (addressing I.): We discussed the current state of research knowledge regarding service provision and employees' qualification in local government front offices (Section 2). We justified the research question and highlight related gaps in current research. For reviewing the research literature, we followed the basic methodology by Vom Brocke et al. (2009), conducting an exhaustive literature search while presenting selected citations. We conducted keyword searches in library databases such as the Electronic Government Reference Library (EGRL) version 11.0, ACM Digital Library, and Science Direct, and used forward and backward searching for retrieved papers. Furthermore, we reviewed the issues of e-Gov-related journals from the past 10 years, including Government Information Quarterly, Transformational Government: People, Process and Policy, Electronic Government, Governance, Electronic Journal of E-Government, and Public Administration Review, as well as the proceedings of e-Government-related conferences, namely the e-Gov track at HICSS conference, dg.o, and IFIP EGOV.

Solution approach (addressing II. building): We then describe our solution approach of developing an *advisory information artifact* supporting changes in front office service provision. We introduce the main components that our solution approach is based upon: *counseling affordances* and *service encounter thinkLets* (SETs). The technical development of counseling affordances and SETs have been discussed in previous publications (Giesbrecht et al., 2015a; Giesbrecht & Schwabe, 2015). However, in this paper, we view the design and application of advisory information artifacts from an

organizational perspective. By so doing, we focus on changes in face-to-face citizen services and the ways these changes can be supported by ICTs and advisory information artifacts.

Findings (addressing II. intervention and evaluation): In collaboration with the local government of a German city, we implemented our solution approach, an advisory information artifact supporting the empowerment of civil servants in the front office in becoming actual advisors to provide citizen-centric advisory services. We then report on our evaluation in a within-subject user test with 12 front office civil servants and 36 citizens. The details of the user test are described in the findings section.

Discussion and Conclusion (addressing III. and IV.): We then elaborate on the insights from the evaluation and reflect on the effects and impacts the advisory information artifacts have on transforming front office services and citizen-centric advising. We go on to highlight the value of the advisory information artifact's in empowering civil servants in the front office in practice. We further discuss the contributions of this study to advancing academic knowledge regarding the subject matter. We finally conclude by outlining the limitations of our research approach and presenting an outlook on future research.

4. Solution approach: introducing an advisory information artifact

In a research collaboration with the local government of a major German city, we developed and implemented the concept of an *advisory information artifact* to help their front offices change from providing government-centric, transaction-oriented processing services to offering citizen-centric advising. An *advisory information artifact* provides civil servants working in front offices with comprehensive on-the-job support, empowering them to provide citizen-centric advisory services. With an *advisory information artifact*, employees in the resource-restricted front office work environment can be given technical and methodical support in order to learn and apply the advisory-related skills required for providing true advisory services. For this purpose, an *advisory information artifact* comprises three essential components: first, an integrated knowledge base, second, "counseling affordances" (Giesbrecht et al., 2015a), and, third, "service encounter thinkLets" (Giesbrecht et al., 2015a).

4.1. Integrated knowledge base

An advisory information artifact's first essential component is an integrated knowledge base. In previous modernization efforts, local governments extended their citizen service offers, focusing on communication channels like the Internet or the telephone to streamline government-citizen relationships. In doing so, they created comprehensive, integrated knowledge bases using ICTs to develop online self-service portals or to support call center agents to access information more efficiently (Kubicek & Hagen, 2000; Layne & Lee, 2001; Steinmetz, 2011; Torres et al., 2005). Modern knowledge bases in the public sector rely on semantic web technologies and service ontologies (Arsovski, Markoski, Pecev, Petrovaeki, & Lacmanovic, 2014; Law, Taduri, Lau, & Kesan, 2015; Sanati & Lu, 2012) to support search and retrieval. In numerous projects, these knowledge bases were developed and continuously maintained and refined, for example, in the context of the "Behördenrufnummer 115" in Germany or "NYC 311" and "Miami Call" in the United States (cf. Steinmetz, 2011). An integrated knowledge base is essential to civil servants in the front office; they need to access the expertise of a broad array of subject matters when responding to the plethora of citizens' information and service requests. Therefore the advisory information artifact has to intelligently integrate the available comprehensive knowledge bases during face-to-face service encounters with citizens.

4.2. Counseling affordances

The second essential component of the advisory information artifact is to provide *counseling affordances*. In our research, we learned that employees – as non-professional advisors – require supplementary methodological support to apply the necessary advisory-related behaviors. *Affordances* describe the action choices an artifact's characteristics provide to its users, which emerge at the time of interaction (Gibson, 1977; Jones, 2003; Stoffregen, 2003). For example, when using a jug, a handle suggests to a user to lift it rather than pushing it. Hence, affordances suggest to users to follow certain methods or to show certain behaviors. Moreover, users are generally able to perceive an artifact's affordances without additional cognitive effort (Fayard & Weeks, 2007; Zillien, 2008). In this manner, *counseling affordances* are technical characteristics of an artifact which encourage users (i.e., civil servants in the front office) to show certain advising behaviors. Different studies have shown that artifacts equipped with suitably designed affordances have a high potential to function as instructional systems that engage learners in critical thinking and promote learning (Jonassen, 1999; Jonassen, Carr, & Yueh, 1998; Young, 2003). Thus, when the integrating artifacts provide corresponding affordances in an employee's work environment, they have the potential to help starting experiential learning cycles (Giesbrecht et al., 2014). In a previous publication (Giesbrecht et al., 2015a), we developed and assessed six key design principles for equipping information artifacts with counseling affordances, which are as follows:

First, an advisory information artifact should support *establishing a shared information space* (first key design principle) for civil servants in the front office, creating an open and participatory work environment. In a shared information space, employees and citizens can collaborate as equal partners, each able to locate, access, and utilize the necessary tools and information resources required (cf. Fig. 4.1).

Second, an advisory information artifact should be built on *connected problem-solving spaces that are linked with distinct process change bumps* (second key design principle), establishing a structured problem-solving process for front office civil servants. In detail, “problem elicitation” and “solution finding” spaces should be provided, each containing all tools and information resources necessary to perform the problem-solving activity (cf. exemplary instantiation in Fig. 4.2). On the left is the initial screen shown when beginning a needs analysis. During the needs analysis activity, the advisor drags icons labeled with predefined general issues into the empty space. These icons become problem cards that can be edited or specified more closely by context-dependent help. The right screen depicts one aspect of a possible solution. In this case, the location and business hours of a government agency. The distinct process change bumps can help employees more consciously and

deliberately move through the individual phases of the advisory process, helping them to structure their advisory encounters with citizens more actively.

Third, an advisory information artifact should *provide collaboration materials and corresponding tools using well-known metaphors* (third key design principle), allowing civil servants in the front office to intuitively use and integrate tools and information resources into their advisory collaborations. Employees should be encouraged to utilize the provided tools and information resources at a greater level, while still maintaining close working relationships with the citizens they are assisting. In Fig. 4.2, the drawing of a cloud on a blue empty background on the left screen is provided to encourage users to begin brainstorming while simultaneously eliciting citizens' problems.

Fourth, an advisory information artifact should *enwrap existing tools and information resources* (fourth key design principle), allowing front office civil servants to apply traditional tools in co-creative work practices. Employees should be encouraged to demonstrate consistent co-creative advising behaviors, which help prevent them from reverting to transaction-oriented work processes and behaviors when using existing tools and information resources. In Fig. 4.2, the right screen shows how location-related information, like the address of the employment office, is integrated in a visualization of advisor-client interactions, represented by a geographical map. In this scenario, the visual display of information resources encourages employees and citizens to jointly explore the information.

Fifth, an advisory information artifact should *provide contextualized memory aid* (fifth key design principle), allowing civil servants in the front office to integrate external information resources smoothly and organically as an advising session occurs. Contextual memory aids encompass not only specific facts (for example, the address of a pediatrician), but also closely related pieces of information (for example, the pediatrician's business hours, or website) that can help employees retain and recall essential information about the topic, such as “no service on Saturday or Sunday.” Developing contextualized memory aids has the capacity to encourage employees to integrate additional knowledge more easily into their advisory exchanges with citizens. As a result, employees can expand their own subject matter expertise, while at the same time being supported in applying their expanded expertise to the service encounter. The white tag cloud feature in Fig. 4.2 shows an exemplary instantiation of contextualized memory aid: When employees select a term in the large cloud (containing frequently asked questions from “new-in-town” citizens), a smaller cloud appears that contains the top eight related problem statements. For instance, when choosing “children,” subtopics like “find a school for my child” point to location-related issues, or “find a pediatrician close by” link to health-related issues. This additional contextualized information can



Fig. 4.1. The established shared information space: advisor (right) and citizen (left) in front of the jointly viewed and operated advisory information artifact (on the table).

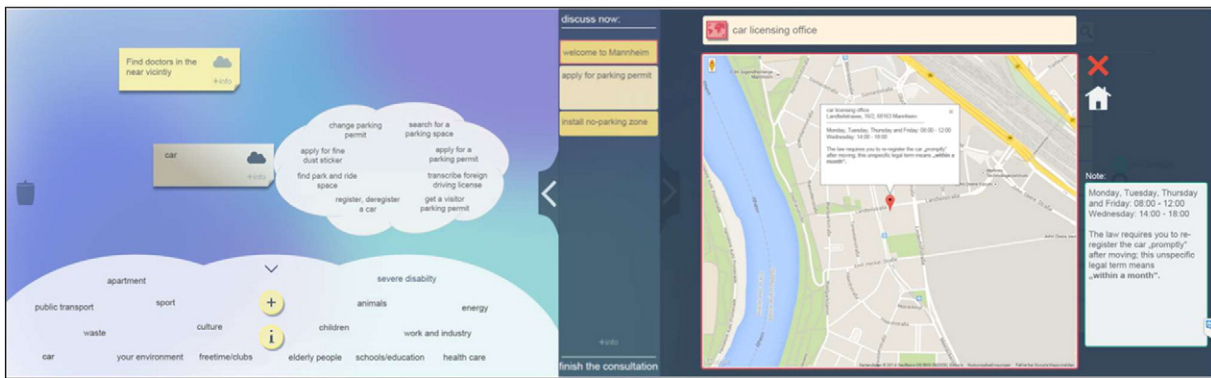


Fig. 4.2. The problem elicitation space (left) and the solution finding space (right) within an advisory information artifact (exemplary instantiations).

help employees locate additional related subject matters, and provide the civil servant with a mechanism to integrate this additional knowledge seamlessly into their unfolding conversation.

Sixth, an advisory information artifact should *provide forward awareness*, that is, anticipatory information (sixth key design principle), which allows front office civil servants to sustain open, participative work environments while working with external information sources. Fig. 4.3 depicts an example of anticipatory information. Whenever the problem statement of “new in town” citizen is entered into the computer system, employees are then provided with a colored dot (see lower left corner) that provides information about the information quality of the solution (green = good, yellow = medium, red = poor). In general, having anticipatory information can enhance coordination and productivity of the actors involved in the advisory session (Cadiz, Venolia, Jancke, & Gupta, 2002; Dourish & Bellotti, 1992). For example, the color red can encourage employees to take action (in order to prevent providing citizens with poor information) and re-discuss the issue at hand, for example, by rephrasing the problem statement. When they are given anticipatory information employees can guide the problem-solving process more actively, and foster a participatory work environment that integrates citizens into their actions, for example by reworking the problem statement.

4.3. Service encounter thinkLets

Along with the technical support provided by the counseling affordances, the design-and-evaluate cycles of the development process revealed that civil servants in the front office need supplementary support to apply the advisory information artifact appropriately in their social interactions and exchanges with advice-seeking citizens. Accordingly, another key component of the advisory information artifact is that it provides social behavior guidelines, helping civil servants in the front office invoke fruitful IS-based collaborations, which best fit the respective problem-solving activity. Based on the concept of thinkLets (Briggs, De Vreede, Nunamaker, & Tobey, 2001; Briggs, De Vreede, &

Nunamaker, 2003; De Vreede, Kolfshoten, & Briggs, 2006), the authors developed the related concept of *service encounter thinkLets*, used to provide practitioners with the necessary collaboration-related knowledge. A *service encounter thinkLet* (SET) provides employees with social behavior guidelines that inform employees about best practices for collaborative problem-solving activities in advisory service encounters. Thereby, SETs allow civil servants in the front office to acquire or improve their moderation and facilitation skills, eliminating the need for time- and cost-intensive employee trainings. Fig. 4.4 depicts an exemplary SET for the problem-elicitation phase. A SET contains basic elements such as: (i) an overview of the SET, for example, what goal can be achieved when a specific collaboration pattern is invoked; (ii) details about how the collaboration pattern can be activated in the form of a script that gives instructions in how to use available tools; and (iii) decision guidelines that help decide which SET to use in what phase of the advisory process (see Giesbrecht & Schwabe, 2015 for elaborate details on SETs). The use of SETs can diminish deficiencies found in other qualification methods for service personnel. In contrast to using scripts when training service personnel (for example, Holman, 2002; Leigh, 1987), SETs provide civil servants in the front office with a set of co-creative work practices to draw on, rather than dictating a rigid, pre-structured advisory process. The “decision guidance” element in each SET enables the civil servant advisors to decide for themselves when and if to apply a certain SET in a problem-solving activity. SETs also let the advisor alter the session and advisory process at any time. This helps mitigate and prevent any negative effects that arise from using standard communication scripts in the advisory process.

In summary, by equipping employees' workspaces with counseling affordances and providing social behavior guidelines in form of service encounter thinkLets, *advisory information artifacts* can be created. These artifacts have a high potential to empower front office civil servants and raise their skill sets on-the-job, even within the resource-restricted work environments of government front offices. Deploying an *advisory information artifact* can enable employees to start acquiring new skills on the job through experiential learning, and eventually transition from their roles as administrators to those of skilled advisors. Advisory information artifacts supply effective support for less-trained service personnel with few (if any) advisory-related qualifications, like civil servants in the front office. Deploying advisory information artifacts in government front offices might be instrumental in overcoming deficiencies of previously applied learning-from-others qualification approaches, which have frequently resulted in a wide variety of training outcomes. As proof-of-concept studies have shown (Giesbrecht et al., 2014), advisory information artifacts can effectively complement training or qualification measures, such as shadowing or mentoring, with systematic on-the-job support. In this way, they help establish more predictable and consistent qualification of front office civil servants when it comes to providing participatory and problem-oriented advisory services.

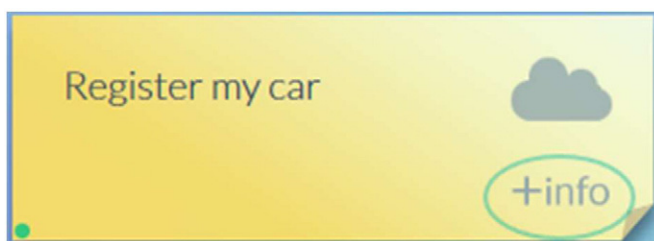


Fig. 4.3. Anticipatory information in form of a colored dot (bottom left) informing users about the solution information quality to expect.

Elicit needs with the cloud	
(-> name)	
Overview (-> script)	
<ul style="list-style-type: none"> You get to know how to elicit the client's needs and problems in close collaboration with the client. You establish a work relationship to the client and initiate a dialog. You ask the client actively questions until you understand his/her problem situation and know which problems are important to him/her. 	
Use „Elicit needs with the cloud“... (-> decision guidance)	
<ul style="list-style-type: none"> to externalize explicit needs or problems of the client and document them in the IT-tool. to disclose the implicit ("hidden") needs of the client and document them in the IT-tool. to deepen the shared understanding of the client's situation (for the client him/herself as well as for yourself). 	
Don't use „elicit with the cloud“... (-> decision guidance)	
<ul style="list-style-type: none"> to provide the client with solution information to their needs to discuss possible solution with the client. 	
What You do? (-> script, tool, configuration)	
Prepare the tool: (-> tool, configuration)	
<ul style="list-style-type: none"> Go to the needs elicitation screen Check that you and the client can see the screen and interact with it. 	
You say: „Please tell me about Your situation. As you can see, we start (-> script) with a clean sheet and together we fill it with the things you need or want to be resolved. The things we have to care about. Please have a look...“	
Do this: (-> script)	
<ul style="list-style-type: none"> Encourage the client to look over the topics in the cloud and to select one or more. Pull out a suitable topic from the cloud and select a suitable problem description from the smaller cloud by dragging it into the free space. You ask the client if the respective problem description suits his/her request. Drag out additional problem descriptions if necessary. You complement the needs elicitation with those problem descriptions that you perceive as necessary by discussing them with the client. You ask the client, if the depicted problem descriptions illustrate his/her current needs and requests. 	
You are finished, when... (-> script)	
<ul style="list-style-type: none"> you have documented all the needs and request of the client in the tool (on individual cards). You and your client agree that you have a comprehensive picture of the client's current problem situation. 	

Fig. 4.4. Exemplary service encounter thinkLet for the problem elicitation phase (Giesbrecht & Schwabe, 2015).

5. Findings

In order to assess and evaluate the efficacy and impact of an advisory information artifact, we implemented an instantiation in a local government front office in a major German city. We used a within-subject user test to assess whether or not, and if so, how, deploying advisory information artifacts in a front office affected overall advisory service provisions, employee work practices, and the quality of the services provided. Before describing the assessment procedure, the evaluation design, the data collection, and the results, we detail below a description of the case and the instantiation of the advisory information artifact.

5.1. Case description

For a government front office in a major German city, the authors developed an advisory information artifact to support front office civil servants in providing high-level and citizen-centric advisory services to “new-in-town” citizens. This group of citizens is typically unfamiliar with local government services and requirements. When moving into a new urban environment, these citizens may not know how to add themselves to the public registry (required in most Europe countries), enroll their child in school, or dispose of different types of waste. Accordingly, front office civil servants need to offer comprehensive and individually tailored advice, rather than merely processing the transaction the citizen came to the office for. The local government front office is not set-up to provide any other services beyond the mere act of registration. However, while processing registrations, employees were often asked by citizens to provide additional information about available government services.

The instantiation of the advisory information artifact and its essential individual components was comprised of (i) an integrated knowledge base provided by the local government and supplemented by the authors, (ii) the counseling affordances, implemented via a 20-inch All-In-One tablet computer with a touch-screen (cf. Fig. 4.1), and (iii) service encounter thinkLets provided on paper (one SET per sheet; cf. Fig. 4.4).

The organizational environment, i.e., a local government's physical front office, provided additional challenges when implementing the

advisory information artifact. First, providing face-to-face citizen services is personnel-intensive, which often results in a high number of part-time employees in the government's physical front offices. As a result, the time required for employees to learn about, train on and then use the instantiated advisory information artifact was spread out over a lengthy period of time. Consequently, the adoption of new workplace practices (communicated by the SETs) and the corresponding supportive IT-means (i.e., the advisory information artifact called “Citizenexplorer”) was severely hampered, which could result in substantially lower advisory service quality.

A second challenge was that due to the siloed structure of back offices, the inter-departmental boundaries substantially hampered creating a knowledge base. At times, it was difficult to provide the necessary all-encompassing information for relevant business processes discussed in citizen advisory services, e.g., “from applying until receiving public benefits. Additionally, the geographically distributed physical front offices, designed to provide citizen advisory service “close to the citizen” in their home districts, resulted in an increased need for location-specific information (e.g., the locations of doctors' offices or schools, or the services offered by neighborhood associations). As a result, implementing the advisory information artifact was limited because doing so required (i) having a knowledge base with both cross-departmental integral and location-specific information, and (ii) suitable retrieval support in order for optimal knowledge base use by employees in face-to-face service encounters.

5.2. Assessment and evaluation design

We assessed and evaluated the effects of introducing the developed advisory information artifact in front offices in a within-subject user test design, where 12 civil servants in the front office (who we refer to as “advisors”) gave advice to 36 citizens in 84 advisory sessions. The 12 advisors were selected by the management of the local government among the staff of their front offices. For the participating citizens, we recruited students from a neighboring city (about 120 km away). This limited their prior knowledge regarding city-specific administrative issues and processes; the subjects could act equally like new residents. Furthermore, this also mimics the city government's needs, since

students represent one of the largest groups of new residents. Of 12 advisors in the test, 9 were female and 3 were male. The advisors were between 19 and 57 years old (mean value 31.3 years) while 22 of the 36 sample citizens were female, and 14 were male. The sample citizens' ages ranged from 18 and 56 years (mean value 27 years).

For the evaluation, we compared the advisors' conventional and artifact-supported advisory sessions, and collected measurable and observational data about the differences. In the conventional advisory sessions, the advisors gave advice as they would normally do in their daily work. In the artifact-supported advisory sessions, the advisors made use of the advisory information artifact. Since we used a within-subject test design, both treatments were tested with the same sample group of participants. In detail, each participant (advisor or citizen) experienced at least one conventional advisory session and one artifact-supported advisory session to report directly on the perceived differences. In reporting on the evaluation and results, we refer to "artifact-supported advisory sessions" when sessions were supported by the advisory information artifact. The other sessions are referred to as "conventional advisory sessions." The test was designed as follows.

First, each advisor received a refresher course on the basic objectives of citizen advisory services, establishing an equal state of knowledge among the advisors. Second, the advisors conducted a conventional advisory session in their normal workplace. Third, in a training episode of five hours, the advisors received technical instructions on how to handle the IT-tool they needed to use for the counseling affordances. They also were asked to read the service encounter thinkLets for the individual problem-solving activities and to try them out in role-plays. Fourth, the advisors conducted three artifact-supported and three conventional advisory sessions, in alternating order. The sample citizens were assigned to advisory sessions, to ensure that each of them experienced both types of advisory session, allowing them to report on the differences in their experiences. Since we followed the action design research approach, we were able to establish external validity by evaluating the artifact in a real organizational context.

5.3. Data collection

Data was collected for the comparison between conventional and artifact-supported advisory sessions through interviews, questionnaires, and video recordings. This allowed the researchers to gather both quantitative and qualitative data on the behaviors and perceptions of the individuals involved.

First, all advisory sessions were video recorded. These recordings were coded and analyzed by two researchers; the advisors' work behaviors regarding their advising behaviors were identified and assessed. In particular, it was assessed how the advisors:

- (i) guided the citizens through a structured problem-solving process counting the number of times an employee engaged in actions such as: proposing topics and asking questions to steer the discussion, explaining the advisory process, or applying auxiliary means to create a comprehensive advisory process),
- (ii) applied available tools and information resources actively and co-creatively within the individual problem-solving activities (identifying statements of invitation for participation and material-supported explanations from advisors), and
- (iii) established and maintained a close relationship with citizens during service encounters (measuring the percentage of conversation time compared to session time, identifying relationship-building actions by advisors, such as asking follow-up questions or showing empathy through active listening, or applying auxiliary means to promote equal access to information).

Second, we conducted semi-structured interviews with all participants to learn about the underlying reasons and motivations for their

behaviors during the advisory sessions. The interview guidelines consisted of questions about satisfaction with the advisory service, citizens' perceptions regarding how the advisors established co-creative interactions with them (using the DART model after (Prahald & Ramaswamy, 2004b), and the perception of involvement in the value creation process. These interviews lasted 35 min on average.

Third, advisors and citizens provided quantitative feedback by filling out a questionnaire. A primary goal of the questionnaire was to assess the advisors' overall empowerment. We used the measuring tool from Spreitzer (1995) for psychological empowerment in the workplace and adapted it to the front-office workplace. We also measured the constructs of *competence* ("I have mastered the skills necessary for giving advice"), *self-determination* ("I have significant autonomy in determining how I structure my advisory sessions"), *meaning* ("The work I do is meaningful to me"), and *impact* ("In my advisory sessions, I have significant influence on the citizens"). Furthermore, we used the KODEX¹ measuring tool (Heyse & Erpenbeck, 2007), which was created to assess, measure and diagnose employees' work-related skills, including their professional, methodical, social/communicative, personal, and activity/action-oriented skills, in order to measure the additional individual front-office skills of that these employees need to have in their roles as advisors. These skills comprise employees' dialog/communication skills, their media competence (knowledge and methodical skills to utilize and integrate available information sources), and their systematic-methodical skills (needed to guide clients through a structured advisory process). Since the KODEX instrument is fairly comprehensive, here we focus on the measurements of aforementioned skills. Finally, additional questionnaire items addressed the participants' perceived service quality (Yield Shift Theory; (Briggs, Reinig, & Vreede, 2012), for example, "I am satisfied with the received advisory session"), their perceived relatedness (included in the IMI measuring instrument (intrinsic motivation inventory; (Deci & Ryan, 2003; McAuley, Duncan, & Tammen, 1989; Ryan, 1982; Ryan, Mims, & Koestner, 1983), for example, "I felt close to the advisor"), and their perceived involvement in the value creation process, ("I felt myself involved in the creation of the result in the following advisory sessions"). All items in the questionnaire were rated on a 7-point Likert scale, with 7 as the high score and positive maximum. The results were further statistically analyzed using Student's *t*-test to identify statistically significant differences between the two treatments, conventional and artifact-supported. Student's *t*-test offers a suitable way to help assess the inter-treatment differences. With the effect size being rather large (we used Cohen's *d*, which was >0.8), using a *t*-test with such a small sample would also be justified.

5.4. General results: empowering civil servants in the front office

Comparing conventional and artifact-supported advisory sessions in our evaluation revealed that both citizens and advisors were significantly more satisfied with the new, artifact-supported advisory service. Citizens rated their satisfaction levels on average at 6.2 in the artifact-supported sessions, but only 5.5 in the conventional sessions (significant difference, two-sided *t*-test, $T(35) = 2.854, p = 0.007$). The advisors rated their satisfaction on average at 5.5 in the artifact-supported sessions, but only 4.4 in the conventional sessions (significant difference, two-sided *t*-test, $T(11) = 2.564, p = 0.026$). Furthermore, the evaluation revealed that advisory information artifacts can substantially help empower front office civil servants in developing their advisory-related skills. The participating advisors themselves, as well as the advice-seeking citizens, rated the aspects of empowerment present in

¹ Originally, Prahald and Hamel (1990) developed the concept of core competencies in organizations in the field of management. In the German-speaking world, the work by Erpenbeck and von Rosenstiel (2007) has been most often used to research corresponding core competencies and their components. Heyse and Erpenbeck (2007) translated their concept into the KODEX instrument to assess, measure, and diagnose personal competencies.

each encounter (competence, self-determination, meaning, and impact Spreitzer, 1995), significantly higher in the artifact-supported advisory sessions than in the conventional ones. Fig. 5.1 depicts the summarized empowerment ratings; we report the detailed results below.

First, the participating citizens assessed the employees' work-related competence level significantly higher in the artifact-supported advisory sessions than in the conventional ones (mean level of 6.2 in the artifact-supported sessions, 5.7 in the conventional sessions; significant difference, two-sided t -test, $T(35) = 2.034$, $p = 0.05$). The citizens emphasized that in the artifact-supported sessions, the advisors "could answer all their questions," "knew how to apply tools and information resources," or, "could always find some solution information." But the advisors also perceived themselves as being significantly more competent when being supported by an advisory information artifact when providing advice to citizens (mean level 5.8 in the artifact-supported sessions, 4.9 in the conventional sessions; significant difference, two-sided t -test, $T(11) = 2.224$, $p = 0.048$). The advisors emphasized that the advisory information artifact supported them in finding and providing helpful information to resolve the citizens' issues, which enhanced their subject matter expertise.

Second, the citizens perceived the advisors in the artifact-supported sessions as substantially more capable of customizing the advisory process to their individual needs than following a standard procedure (mean level 5.8 in the artifact-supported sessions, 5.1 in the conventional sessions; significant difference, two-sided t -test, $T(35) = 2.833$, $p = 0.008$). Furthermore, the citizens described that they could "understand the solution better [...] how they match their needs" and that "it was more personalized". The advisors' feedback confirmed these perceptions; in the artifact-supported sessions they perceived themselves as being considerably better able to adapt and tailor the advisory process (mean level 5.6 in the artifact-supported sessions, 4.6 in the conventional sessions; significant difference, two-sided t -test, $T(11) = 2.846$, $p = 0.016$). The advisors also referred to the artifact's explicit support. One advisor, for instance, noted that, "With the information from the little lights [the anticipatory information], I could guide the solution discussion much better."

Third, the citizens perceived that in the artifact-supported advisory sessions, advisors had considerably more influence in shaping the lives of the "new-in-town" citizens (mean level 5.2 in artifact-supported sessions, 4.5 in conventional sessions; significant difference, two-sided t -test, $T(35) = 2.262$, $p = 0.03$). One citizen, for instance, stated, "The advisor in the first session [the artifact-supported advisory session] had more [of an] influence on me [...] [and] on my next activities." The advisors confirmed the citizens' perceptions, rating the impacts of their own work in the artifact-supported sessions as significantly higher (mean level 5.4 in artifact-supported sessions, but only 4.5 in conventional sessions; significant difference, two-sided t -test, $T(11) = 2.267$, $p = 0.045$). One advisor mentioned, "I believe[d] that in my artifact-supported sessions, I could reach the citizens better." And another

advisor stated, "I think that the citizens in artifact-supported sessions [were] more likely to implement the to-do's that we discussed."

And fourth, in addition to the advisors' improved work-related skills (as perceived by citizens and advisors alike), the participating citizens found that the advisors in the artifact-supported advisory sessions had a considerably higher level of "meaning," that is, understanding and meaningfulness of their work (mean level 6.0 in the artifact-supported sessions, 5.6 in the conventional sessions; significant difference, two-sided t -test, $T(35) = 2.162$, $p = 0.037$). The advisors also assigned a significantly higher level of "meaning" to the advisors' work in artifact-supported advisory sessions compared to traditional sessions (mean level 5.8 in the artifact-supported sessions, but only 4.8 in the conventional sessions; significant difference, two-sided t -test, $T(11) = 2.634$, $p = 0.023$).

5.5. Transforming effects of applying advisory information artifacts

While this evaluation revealed that introducing an advisory information artifact has the potential to substantially empower civil servants in the front office and improve advisory services, the data, especially participants' qualitative feedback and observations, indicate that the advisory information artifact also helped initiate more profound changes in citizen advisory services.

By introducing an advisory information artifact, the physical environment of the face-to-face service encounter changed substantially, influencing the behaviors of both types of participants. Though they sat on opposite sides of a desk in the conventional sessions, in the artifact-supported sessions employees and citizens positioned themselves side-by-side in front of the advisory information artifact (Fig. 4.1 depicts the physical setup in artifact-supported advisory sessions). When put in a different workplace environment, citizens and employees began to change their perceptions about their service encounters: Participating citizens preferred the artifact-supported sessions and emphasized the "closer collaboration" and "more direct communication" with the advisors. Nine of twelve citizens made similar statements regarding artifact-supported sessions, appreciating being able to "follow the advisor's actions and comprehend how the solutions was found." One citizen stated, "[in the artifact-supported session] I understood the solutions better [...] [and] how they match[ed] my needs." In contrast, when referring to the conventional advisory sessions, citizens found these "not so well structured," or the solutions were "harder to comprehend" In this context, citizens perceived themselves as significantly better involved in the problem-solving process during that artifact-supported sessions (mean level 5.1 in the artifact-supported sessions, 4.2 in the conventional sessions; significant difference, two-sided t -test, $T(35) = 2.394$, $p = 0.022$). Furthermore, citizens clearly indicated that they comprehended the results substantially better in artifact-supported sessions (mean level 5.5 in artifact-supported sessions, 4.6 in conventional sessions; significant difference, two-sided t -test,

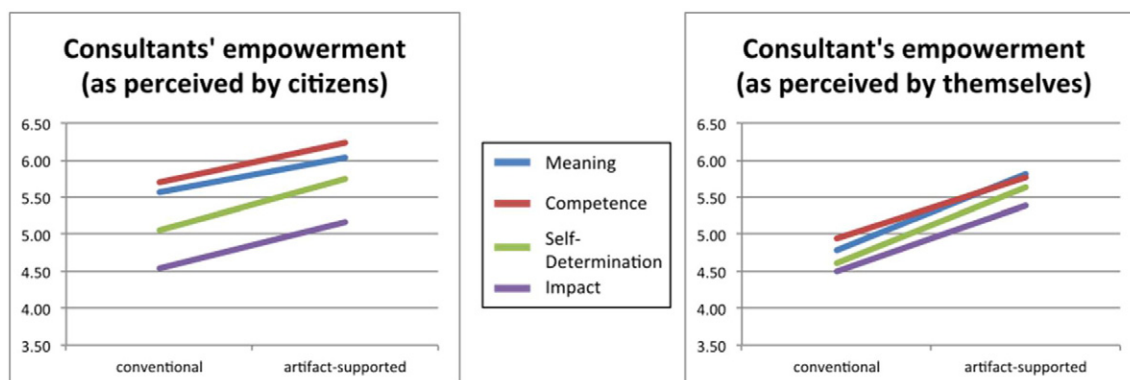


Fig. 5.1. The effects of introducing an advisory information artifact in front office services on employees' empowerment.

$T(35) = 3.171, p = 0.003$). In this context, conversation time between advisors and citizens increased substantially in artifact-supported advisory sessions compared to conventional sessions (on average, they talked with each other for 71% of the total advisory session time in the artifact-supported sessions, in contrast to only 54% in the conventional sessions).

Being in the changed workplace environment, advisors also began changing their overall attitude toward front-office work; from the typical for conventional sessions, “I don’t want the client to participate and to be too close to me,” to “[I] especially like[d] the collaboration with the citizen,” or even, “it is fun to work with the citizens that closely.” One employee summarized the benefit of artifact-supported sessions as, “We [advisor and citizen] could establish a shared understanding of the citizen’s problems much quicker.” In this context, the advisors perceived that in artifact-supported sessions they could engage advice-seeking citizens in the problem-solving process significantly better (mean level 5.4 in the artifact-supported sessions, 4.4 in the conventional sessions; two-sided t -test, $T(11) = 3.317, p = 0.007$).

Our observations also revealed that service encounters between advisors and citizens changed substantially between conventional and artifact-supported advisory sessions. While in conventional sessions a question-answer pattern with predominantly one-way communication prevailed, in artifact-supported sessions a recognizable problem-solving process unfolded, including extensive information exchanges. In this context, both advisors and citizens perceived the advisors to be significantly better able to control and steer the advisory process in artifact-supported advisory sessions than in the conventional sessions (significant difference; cf. advisors’ and citizens’ self-determination ratings in 5.4). Furthermore, citizens also expressed their appreciation of the changed advisory process. A third of the participating 36 citizens stated that the new advisory process allowed them “to learn new things” or “be given useful information that they would not have expected.” The advisors appreciated that the problem-solving process was made more visible to the citizens and it “showed their work to the citizens.” One advisor stated, “The citizens could see all the work I am doing [...] therewith, they appreciated my work more.” The advisors’ appreciation of the changed service encounter was also reflected in their substantially higher ratings in the artifact-supported advisory sessions for the meaningfulness of their advisory work and the impact on the citizens (cf. values in 5.4). Finally, 10 of the 12 advisors made statements that in the changed advice-delivery process of the artifact-supported advisory sessions, citizens were “more active,” would “understand faster,” and ultimately could “work more efficiently.”

When analyzing the observations, we found that the advisors substantially changed their roles and respective behaviors when they switched from conventional to artifact-supported advisory sessions. In the conventional advisory sessions the advisors awaited citizens’ requests; in the artifact-supported sessions the advisors initiated lively discussions, mutually exchanging knowledge while actively guiding the conversations. These observations were also supported by citizens’ feedback; their ratings for the advisors’ communication and dialog-related skills were substantially higher in artifact-supported sessions (mean level 6.2 in the artifact-supported advisory sessions, 5.7 in the conventional ones; significant difference, two-sided t -test, $T(35) = 2.14, p = 0.04$). Furthermore, citizens believed that in artifact-supported sessions, the advisors made more appropriate use of available tools and information resources (mean level 6.1 in the artifact-supported advisory sessions, but only 5.3 in the conventional sessions; significant difference, two-sided t -test, $T(35) = 3.329, p = 0.002$). The advisors appreciated the support from the advisory information artifact and in their feedback, they referred to various features that supported the structuring of the advisory process and the integration of available tools and information resources. 8 of the 12 participating advisors, for instance, explicitly noted that the tag cloud feature helped them uncover the citizens’ needs more efficiently. Or, 4 of the 12 advisors said that

the anticipatory information provision was the most helpful feature, supporting active guidance throughout the exchanges.

Finally, the role of citizens also substantially changed between conventional and artifact-supported advisory sessions. In conventional advisory sessions, citizens waited for the advisors to provide them with answers to previously asked questions. In contrast, in artifact-supported sessions, the citizen sat side-by-side with the advisor, enabling them to monitor and access information, and help create the advisory session’s results. Advisors’ repeated invitations to participate in the process supported the citizens in assuming the role of active co-creators (on average, there were 4 invitations to participate in artifact-supported sessions, but no invitations in conventional sessions). Indicating her appreciation of the close collaboration with an advisor, one citizen summarized, “I clearly prefer[ed] the supported advisory session. I liked to be able to participate more [...] the advisors integrated me actively in all steps.”

6. Discussion and implications

The evaluation provides initial evidence that *advisory information artifacts* have the capacity to empower public employees working in the resource-confined front office environments to provide true advisory services (addressing the research question). With relatively little training once the advisory information artifact is introduced, front office employees can almost immediately improve their advisory-related on-the-job skills and transform into actual advisors. Designing advisory information artifacts and making them integral parts of employees’ work environments turned out to be a viable complement to existing learning-from-others qualification measures. The advisory information artifacts enabled front office civil servants, both newly assigned and long-term, to acquire the skill sets necessary for working in modern public administration. This result directly addresses Lenk’s (2002), Schenk and Schwabe’s (2011), and Schuppan’s (2010) pleas for research and increased academic knowledge on how qualification-related deficiencies in public service provision can be effectively diminished.

As the results demonstrate, the advisory information artifact not only supports civil servants in the front office in improving their professional, methodical, and personal skills (Giesbrecht et al., 2015a; Giesbrecht & Schwabe, 2015), but it also helps employees reach a state of actual empowerment (Spreitzer, 1995) in their novel role as advisors. Citizens perceived advisors as significantly more competent and more trustworthy when giving advice, resulting in improved service satisfaction. The substantial improvement in employees’ perceptions about the meaningfulness and impact of their work may also strengthen their intrinsic work motivations. As Wright (2007) and Anderfuhren-Biget et al. (2010) pointed out, public service motivation is a highly influential factor when considering public employees’ work performances. As they became more empowered in the workplace, the public employees began valuing front-office work more highly, changing from their traditionally low assessment of it as compared to back office activities (Weerakkody et al., 2011).

In local government front offices, service practices must transform to meet the increased service-quality expectations of citizens (Accenture, 2005; Schedler & Proeller, 2000) and to implement citizen-centric advisory services (cf. King & Cotterill, 2007; United Nations & Department of Economic and Social Affairs, 2014; Weerakkody et al., 2011). Our study clearly shows that deploying an advisory information artifact has the capacity to promote substantial changes in front office service provisions, offering more citizen-centric and co-creative advisory services, rather than mere transaction-oriented processing. This shift helps initiate a change of the service paradigm.

In the following paragraphs, we discuss how an advisory information artifact can support such changes in service provision, employing the drama metaphor (Grove & Fisk, 1992; Zomerdijsk & Voss, 2010) often used “to understand, describe and communicate about services” (Zomerdijsk & Voss, 2010, p. 68). The basic service delivery process, the

service provider (i.e., civil servants in the front office), the clients (i.e., citizens), back office support (i.e., tools and information resources), and the physical environment make up the main service components.

6.1. The service delivery process: from government-centric to citizen-centric service

Providing civil servants in the front office with counseling affordances and service encounter thinkLets caused the service delivery process to change substantially. Traditionally, public employees treated citizens as petitioners and focused on processing pre-defined transactions. They used selected information resources that were provided based on to government needs. The left side of Fig. 6.1 illustrates the traditional service encounter with its underlying paradigm. Yet, with the introduction of the advisory information artifact, civil servants in the front offices started to provide co-creative advisory services where citizens felt that they were treated as actual clients. Additionally, civil servants used integrated information resources aligned to citizens' needs. The right side of Fig. 6.1 illustrates the novel, artifact-supported service encounter. The concept of affordances turned out to be most suitable to effectively providing methodical guidance, encouraging employees to try out novel work practices on-the-job. Employees could see the positive effects of the service paradigm change and reflect on its benefits, which eventually led to adopting novel advisory practices. Furthermore, the predictability of the SET-invoked patterns of collaboration and the integrated information base provided employees with the support they needed to confidently and competently transition from administrator to advisor. Therewith, we showed how *advisory information artifacts* could be designed and applied to effectively support initiating changes in local governments' service provision strategies to move toward more citizen-centric service delivery as Weerakkody et al. (2008, 2011), King and Cotterill (2007), Davison et al. (2005) or Irani et al. (2007) had demanded.

6.2. The physical environment: enabling co-creative advisory services

By introducing an advisory information artifact, specifically the counseling affordances, the physical environment of the service encounter substantially changed. The physically-established shared information space facilitated building a close work relationship between the actors, as Heinrich, Kilic, Aschoff, and Schwabe (2014) described. Furthermore, it supported the reduction or even elimination of communication and information barriers, as Rodden, Rogers, Halloran, and Taylor (2003) called for. Consequently, after deploying an advisory information artifact, the changed physical environment encouraged its users, that is, civil servants in the front office and citizens, to act as co-creators with the same rights (to access and edit information) and duties (to participate and contribute actively to reach the advisory

session's objective). This highlights the importance of the physical environment in enabling co-creative service encounters, which are preconditions for establishing the citizen-centric services called for by Weerakkody et al. (2008) or King and Cotterill (2007).

6.3. Civil servants in the front office: from bureaucratic administrators to skilled advisors

With the help of counseling affordances, civil servants in the front offices were enticed to try out novel advisory practices, and start learning and applying the skills they needed to resolve an advice-seeking citizen's diverse and complex information needs. Therewith public employees gradually morphed from back-office bureaucrats into advisors extending their work practices from previous transaction-oriented administrative processing to co-creative advising. Civil servants started to moderate the problem-solving process and help citizens with their diverse information needs to successfully cope with the myriad of governmental information sources and services. By deploying an *advisory information artifact*, we showed how the back-office specialists could be transformed into generalists who acquired the necessary methodical skills and subject-matter knowledge to handle a wide range of citizens' information and service requests. In this regard, we continued the research of Lenk (2002), Schenk and Schwabe (2011) or Lenk and Klee-Kruse (2000), and specified how civil servants in the front office could effectively be empowered to provide citizen-centric services in modern public administrations. Accordingly, we are convinced that introducing an advisory information artifact to government front offices can help promote citizen-centric structures and work practices.

Using ICTs to “make offers” (following the concept of affordances) and making them an integral part of the civil servant in the front office's work environment turned out to be a suitable means to promote employees' on-the-job learning and support their changing role in the service encounter. More specifically, the combination of counseling affordances and SETs functions as a scaffolding framework for civil servants in the front office. This serves the advisor's role as “boundary spanners” (Schuppan, 2015) between the citizen and the public administration and offers an alternative approach to the classical, but inappropriate “electronic leash” (Hill, Schuppan, & Walter, 2012; Schuppan, 2015) for service workers.

6.4. Citizens: from petitioners to active co-creators

When deploying tailored advisory information artifacts, the service settings change the way that citizens perceive themselves as clients rather than petitioners, and become active co-creators of the service and its outcomes. Citizens' perceptions of government services might reflect an increase in service quality in the course of taking more responsibility for the advisory service's product and value (Pralhad &

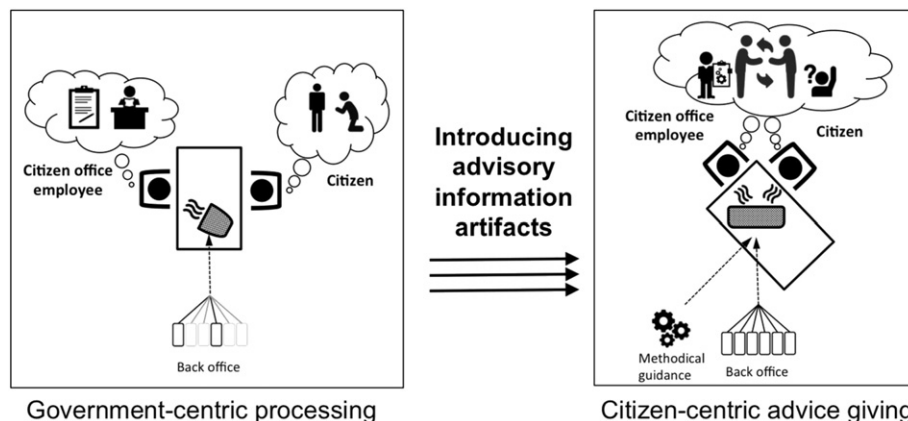


Fig. 6.1. Changes from introducing advisory information artifacts: from government-centric processing to citizen-centric advice giving.

Ramaswamy, 2004a; Schmidt-Rauch & Nussbaumer, 2011). Under these conditions, the service encounter can become an entirely positive experience for the citizens (Pralhad & Ramaswamy, 2004b).

6.5. Back office support: from simple information provision to offering methodical guidance and integrated information resources

In conventional service settings, information resources merely provide the information necessary for processing pre-defined transactions, such as car registration or passport extension (cf. Fig. 6.1 on the left). Furthermore, they rarely provide any additional support, such as how to apply available information resources methodically during the service encounter. Using advisory information artifacts can completely change the service encounter: First, they can provide integrated information resources, bringing together distributed information and services from silo-structured back offices. Second, thanks to the counseling affordances, they can provide methodical guidance on how to integrate information resources appropriately into service encounters with citizens to create co-creative interactions. In this way, they help civil servants in the front office provide the broad subject matter expertise required. Thus, advisory information artifacts address a problem that characterizes public administrations: the very high number and variety of services (Algermissen et al., 2005).

6.6. The ongoing change and the interplay of delivery modes in government service provision

The evolution of ICT-based service delivery mechanisms has helped governments provide an increasing number of informational and transactional services online. These not only provide convenient and high-quality services to businesses and citizens at locations of their own choosing, but also reduce the service load in front offices while lowering service provision costs. However, it is worthwhile to note that the majority of the services that can be provided online are merely simpler and more structured informational and transactional services. Paying a tax bill online or looking up the details of a licensing requirement are cases in point. However, when it comes to more complex, semi-structured, or unstructured service requests, the front office has remained the most frequented venue for service delivery. We found that when utilizing advisory information artifacts for service provision in front offices, the quality of service can measurably improve, which also leads to the perception of improved service quality on the part of businesses and citizens. Advisory information artifacts prepare government employees to provide comprehensive services outside and beyond their own immediate area of expertise. Additionally, front-office service provision has the capacity to match online services in high-quality outcomes and superior service experiences, potentially also at a lower cost. Positive side effects may include that front-office work becomes more attractive to employees, and that employees might feel empowered and more highly valued internally and externally. Finally, the new front-office service provision model complements the successful online service model, albeit primarily for more complex and less structured service requests (see Fig. 6.2), lifting overall government service provision to higher levels of quality and immediacy.

7. Conclusion

In this paper, we address a gap in current research on transforming government, the face-to-face citizen service encounter. We identified the qualification of civil servants in the front office as a missing factor for achieving value co-creation, which represents an essential part of providing more citizen-centric services. Researchers and practitioners striving to transform government in general, and its front offices in particular, are the primary target group of our research. By introducing a suitably designed *advisory information artifact*, they can effectively advocate for transforming front offices in order to offer citizen-centric,

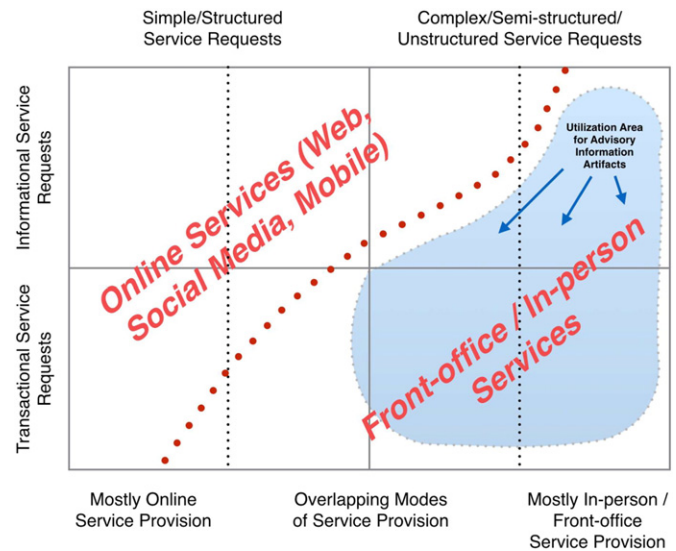


Fig. 6.2. Advisory information artifacts in the front office help match front office service quality and service outcome expectations to those of online services, lifting overall service quality.

co-creative advisory services as Weerakkody et al. (2008, 2011), Davison et al. (2005) or Irani et al. (2007) called for. The concept of an advisory information artifact sheds light on the importance of moderation skills in the public sector. Much more than in the (sales-) oriented private sector (e.g. Novak, 2009), a public advisor can be viewed as a process guide in two ways: He provides citizens with guidance on their complex life situations as an outcome of the advisory session; and he moderates the advisory process itself toward a good outcome. Providing an information system based on the notion of counseling affordances is just one step; the other important aspects are the work practices that can be trained with thinkLets. In our case (and in contrast to other research in collaboration engineering (Briggs, Kolfshoten, de Vreede, Lukosch, & Albrecht, 2013) facilitation affordances and thinkLets are tightly linked and reinforce one another. Replacing one of them by less-suited means could lead to them blocking one another. Thus the most important practical engineering conclusions this paper opens the door to are carefully designed advisory work-practices.

We hold that two other research streams may also benefit from our results. First, researchers from collaboration engineering can see how their research can be extended to the setting of dyads. Traditionally, collaboration engineering has targeted larger groups (>5 people) and has not considered the asymmetric relationships that characterize advisory service encounters. Second, e-learning researchers might benefit from a better understanding of how affordances can be used to advance learning in the workplace. Specifically, the role of ICT in effectively guiding learners to improve their work-related skills might be of great interest, leading to an adoption of the concept of counseling affordances in order to improve e-learning system designs.

Local governments' managements can benefit from this study's insights and use the concept of an *advisory information artifact* to promote service modernization efforts by complementing these with suitable front-office measures. Designers and developers of information systems used in front offices can adopt the concepts of counseling affordances and service encounter thinkLets to improve system design, making them an integral part of managers' modernization efforts. Already, simply building on the idea of two users sharing a screen (design principle 1) will help to move the service encounter toward greater collaboration, particularly if the material is presented using well known metaphors (design principle 3) and a minimum amount of transparent structure is provided (design principle 2). This collaboration-enhancing environment should also seamlessly integrate existing tools and information resources (design principle 4) and reduce the cognitive load through

contextualized memory aid (design principle 5). It should also allow the advisor to “look ahead” and thus assure that he or she does not appear incompetent (design principle 6). However, tools are only one part of the solution. They “offer” facilitation capabilities to the front office employee. Empowering him to accept this offer with confidence is the other part. Here the thinkLets concept (implemented as service encounter thinkLets) proposes suitable work and communication practices. It provides a scaffold without pressing the advisor and client into a fixed structure. And it always leaves the advisor in control. This distinguishes from workflow systems or scripts that are applied in call centers (Schuppan, 2014). We are confident that the combined concept of an advisory information artifact can also be applied in other repetitive, high-public-value advisory services, e.g., for social benefits.

Our study showed that initiating a service paradigm change in the front offices by introducing *advisory information artifacts* also points to certain preconditions required for the artifact to work effectively. First, public employees need the ability to perceive the affordances that are provided to them, i.e., the action possibilities, as affordances that need to be learned (Guski, 1996). Second, for the advisory information artifact to be most effective, public employees need to develop a basic service motivation. This includes the willingness to put citizens in the center of their work and the urge and openness to learn new work practices, allowing them to leave the traditional role as administrators and become advisors. Persisting problems that can counteract implementing these preconditions include that public employees still often perceive front-office activities as lower in ranking than back-office activities (Weerakkody et al., 2011). Or, also, an employees' transfer into a front office position frequently occurs when they are deemed not fit for back office jobs (Lenk & Klee-Kruse, 2000; Schenk & Schwabe, 2011). Providing an appropriate organizational environment and incentive system is thus a major challenge for responsible leadership. In future research, the initial insights on the job requirements of civil servants in front offices need to be expanded. Studying job profiles for public service personnel would help deepen the understanding of citizen-centric service provision and, especially, its most important enablers, that is, the civil servants in the front office. But one-stop government should not stop at the employee-level. Public administrations should rethink their service model and can now transfer more service offerings from specialists to generalists. Some services will be completely transferred to a general service desk, some will be mainly handled by the citizen advisor while having a specialist as back-up, and some will only be orchestrated by the advisor and then handled by a specialist or an automated e-Government service.

The concept of an advisory information artifact builds on the general concept of affordances (Gibson, 1977; Stoffregen, 2003) and of thinkLets (Briggs et al., 2001, 2003), and is fitted to a generic problem-solving process (Simon et al., 1987). Hence, our findings might be generalizable either to other front-office service encounters in different agencies and governmental departments, for example, social welfare, or also private service domains, for example, advisory services in travel agencies or financial advisory services. However, operational design and instantiation should be adapted to the respective domain in a design-and-evaluate process for providing the best fit of the advisory information artifact.

Like all other research, this study has its limitations. Working with actual civil servants in the front office in real-world work environments gave us deep insights but also restricted our possibilities for evaluation. The introduction of the advisory information artifact was only evaluated in a test over six days. Hence, we cannot draw conclusions on the actual organizational integration and long-term appropriation of the advisory information artifact. For addressing this limitation, we currently run a longer-period test in other front offices of the same major German city. By this undertaking we are collecting additional data, which will likely deepen our organizational insights on the efficacy of advisory information artifacts in front-office work environments and their sustainable effects on front office service provision.

Tobias Giesbrecht is a PhD student in Computer Science at the University of Zurich since 2009. He is a research assistant in the Information Management Research Group lead by Prof. Dr. Gerhard Schwabe. His research interests lie on collaborative technologies in dyadic service encounters, i.e., advisory services, in public administrations. He focuses on user empowerment and researches how IT should be designed in order to support public administration's employees develop their skills on-the-job.

Hans J. Scholl is an Associate Professor in the Information School at the University of Washington, Seattle, WA. From the University of Albany, he earned a Ph.D. in Information Science. He also holds a Master's degree in Business Administration from the GSBA Zurich, Switzerland. His research interests are focused on information management, organizational change, electronic government, mobile technology evolution, and disaster information management. A former President of the Digital Government Society he currently serves as Vice Chair of the IFIP Working Group 8.5 (Information Systems in Public Administration). He also chairs the globally top-ranked EGOV Track at the Hawaii International Conference on System Sciences (HICSS).

Prof. Dr. Gerhard Schwabe has held a chair on Information Management at the Computer Science of the University of Zurich since 2002. His research interests concentrate on collaborative technologies and information management in service industries (financial services, public administration, tourism software industry).

References

- Accenture (2005). *Leadership in customer service: New expectations, new experiences (the government executive series)*.
- Akesson, M., & Edvardsson, B. (2008). Effects of e-government on service design as perceived by employees. *Managing Service Quality*, 18(5), 456–478.
- Algermissen, L., Delfmann, P., & Niehaves, B. (2005). Experiences in process oriented reorganization through reference modelling in public administrations—the case study REGIO@KOMM. *ECIS 2005 proceedings* (pp. 134).
- Anderfuhren-Biget, S., Varone, F., Giauque, D., & Ritz, A. (2010). Motivating employees of the public sector: Does public service motivation matter? *International Public Management Journal*, 13(3), 213–246.
- Andersen, K. V. (2006). e-Government: Five key challenges for management. *Electronic Journal of E-Government*, 4(1), 1–8.
- Apostolou, D., Mentzas, G., Stojanovic, L., Thoenssen, B., & Lobo, T. P. (2011). A collaborative decision framework for managing changes in e-Government services. *Government Information Quarterly*, 28(1), 101–116.
- Arsovski, S., Markoski, B., Pecev, P., Petrovaeki, N., & Lacmanovic, D. (2014). Advantages of using an ontological model of the state development funds. *International Journal of Computers Communications & Control*, 9(3), 261–275.
- Askim, J., Fimreite, A. L., Moseley, A., & Pedersen, L. H. (2011). One-stop shops for social welfare: The adaptation of an organizational form in three countries. *Public Administration*, 89(4), 1451–1468. <http://dx.doi.org/10.1111/j.1467-9299.2011.01933.x>.
- Balasubraman, S., Peterson, R. A., & Jarvenpaa, S. L. (2002). Exploring the implications of M-commerce for markets and marketing. *Journal of the Academy of Marketing Science*, 30(4), 348–361. <http://dx.doi.org/10.1177/009207002236910>.
- Bannister, F., & Conolly, R. (2013). Forward to the past: Lessons for the future of e-government from the story so far. *ICT, Public Administration and Democracy in the Coming Decade*, 20(3).
- Belardini, A. (2013). Growing retail revenues at airports. *Journal of Airport Management*, 7(3), 222–230.
- Belkin, N. J., Oddy, R. N., & Brooks, H. M. (1982). Ask for information retrieval: Part I. Background and theory. *Journal of Documentation*, 38(2).
- Bogumil, J., & Jann, W. (2008). *Verwaltung und Verwaltungswissenschaft in Deutschland: Einführung in die Verwaltungswissenschaft*. Springer-Verlag.
- Briggs, De Vreede, G., Nunamaker, J. F., Jr., & Tobey, D. (2001). ThinkLets: Achieving predictable, repeatable patterns of group interaction with group support systems (GSS). *System sciences, 2001. Proceedings of the 34th annual Hawaii international conference on*. IEEE (Retrieved from http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=926238 (p. 9–pp)).
- Briggs, De Vreede, G. -J., & Nunamaker, J., Jr. (2003). Collaboration engineering with ThinkLets to pursue sustained success with group support systems. *Journal of Management Information Systems*, 19(4), 31–64.
- Briggs, Reing, B. A., & Vreede, G. J. (2012). The yield shift theory of satisfaction and its application to the IS/IT domain. *Information Systems Theory*, 185–217.
- Briggs, R. O., Kolfshoten, G. L., de Vreede, G. -J., Lukosch, S., & Albrecht, C. C. (2013). Facilitator-in-a-box: Process support applications to help practitioners realize the potential of collaboration technology. *Journal of Management Information Systems*, 29(4), 159–194.
- Cadiz, J. J., Venolia, G., Jancke, G., & Gupta, A. (2002). Designing and deploying an information awareness interface. *Proceedings of the 2002 ACM conference on computer*

- supported cooperative work (pp. 314–323). ACM (Retrieved from <http://dl.acm.org/citation.cfm?id=587122>).
- Davison, R. M., Wagner, C., & Ma, L. C. K. (2005). From government to e-government: A transition model. *Information Technology & People*, 18(3), 280–299.
- de Reuver, M., Stein, S., & Hampe, J. F. (2013). From eParticipation to mobile participation: Designing a service platform and business model for mobile participation. *Information Policy: The International Journal of Government & Democracy in the Information Age*, 18(1), 57–73.
- De Vreede, G. -J., Kolfschoten, G. L., & Briggs, R. O. (2006). ThinkLets: A collaboration engineering pattern language. *International Journal of Computer Applications in Technology*, 25(2), 140–154.
- Deci, E. L., & Ryan, R. M. (2003). Intrinsic motivation inventory. Retrieved January 10, 2013, from <http://www.selfdeterminationtheory.org/questionnaires/10-questionnaires/50>
- Denhardt, R. B., & Denhardt, J. (2000). The new public service: Serving rather than steering. *Public Administration Review*, 60(6), 549–559.
- Dourish, P., & Bellotti, V. (1992). Awareness and coordination in shared workspaces. *Proceedings of the 1992 ACM conference on computer-supported cooperative work* (pp. 107–114). ACM (Retrieved from <http://dl.acm.org/citation.cfm?id=143468>).
- Erpenbeck, J., & von Rosenstiel, L. (2007). *Handbuch Kompetenzmessung*. Stuttgart: Schäfer/Pöschel.
- Fayard, A. -L., & Weeks, J. (2007). Photocopiers and water-coolers: The affordances of informal interaction. *Organization Studies*, 28(5), 605–634. <http://dx.doi.org/10.1177/0170840606068310>.
- Fountain, J. (2001). Paradoxes of public sector customer service. *Governance*, 14(1), 55–73.
- Gibson, J. (1977). *The theory of affordances. Perceiving, acting, and knowing*. Hillsdale (N.J.): Lawrence Erlbaum Associates Inc.
- Giesbrecht, T., & Schwabe, G. (2015). Service Encounter ThinkLets: How to Empower Service Agents to Put Value Co-Creation into Practice. *Accepted in Information Systems Journal*. (is in publication process).
- Giesbrecht, T., Schmidt-Rauch, S., & Schwabe, G. (2011). Toward value co-created citizen advisory – The smart advisory skills. *Proceedings of the 6th Mediterranean conference on information systems*. Limassol: AIS (Association for Information Systems).
- Giesbrecht, T., Schenk, B., & Schwabe, G. (2015a). Empowering front office employees with counseling affordances. *Transforming Government: People, Process, Policy*, 9(4) (pp. 517–544). Emerald Group Publishing Limited.
- Giesbrecht, T., Schenk, B., & Schwabe, G. (2015b). From facilitation to counseling affordances: On-the-job empowerment of front Office Employees. *Under Review at Transforming Government: People, Process, Policy*.
- Giesbrecht, T., Schenk, B., & Schwabe, G. (2014). Learning with facilitation affordances: The case of Citizens' advice services. *Proceedings of ECIS 2014, Tel Aviv, Israel*.
- Gong, Y., & Janssen, M. (2012). From policy implementation to business process management: Principles for creating flexibility and agility. *Government Information Quarterly*, 29, S61–S71. <http://dx.doi.org/10.1016/j.giq.2011.08.004>.
- Gregor, S., Martin, M., Fernandez, W., Stern, S., & Vitale, M. (2006). The transformational dimension in the realization of business value from information technology. *The Journal of Strategic Information Systems*, 15(3), 249–270. <http://dx.doi.org/10.1016/j.jsis.2006.04.001>.
- Grove, S. J., & Fisk, R. P. (1992). The service experience as theater. *Advances in Consumer Research*, 19(1), 455–462.
- Gupta, M. P., & Jana, D. (2003). E-government evaluation: A framework and case study. *Government Information Quarterly*, 20(4), 365–387.
- Guski, R. (1996). *Wahrnehmen: ein Lehrbuch*. Kohlhammer W.
- Heinrich, P., Kilic, M., Aschoff, F. -R., & Schwabe, G. (2014). Enabling relationship building in tabletop-supported advisory settings. *Proceedings of the 17th ACM conference on computer supported cooperative work & social computing*. Baltimore: ACM (Association for Computing Machinery).
- Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 75–105.
- Heyse, V., & Erpenbeck, J. (2007). *Kompetenzmanagement: Methoden, Vorgehen, KODE und KODE@ X im Praxistest*. Waxmann.
- Hielscher, V., & Ochs, P. (2009). *Arbeitslose als Kunden? Beratungsgespräche in der Arbeitsvermittlung zwischen Druck und Dialog. Vol. Band 12*. Berlin: Edition sigma.
- Hill, H., Schuppan, T., & Walter, K. (2012). Rethinking e-government from below: New skills for the working level? *Proceedings of the 13th annual international conference on digital government research* (pp. 264–265). ACM (Retrieved from <http://dl.acm.org/citation.cfm?id=2307777>).
- Holman, D. (2002). Employee wellbeing in call centres. *Human Resource Management Journal*, 12(4), 35–50.
- Hummel, S., & Krcmar, H. (2003). *Qualifizierung - Voraussetzung zur Bewältigung der Veränderung in der öffentlichen Verwaltung. Lernwege zum Electronic Government* (pp. 26–40). Mössingen: Talheimer Verlag.
- Irani, S., Elliman, T., & Jackson, P. (2007). Electronic transformation of government in the UK: A research agenda. *European Journal of Information Systems*, 16(4), 327–335.
- Jonassen, D. (1999). Designing constructivist learning environments. *Instructional-design theories and models: A new paradigm of instructional theory, volume II*. Lawrence Erlbaum Assoc. Inc.
- Jonassen, D., Carr, C., & Yueh, H. -P. (1998). Computers as mindtools for engaging learners in critical thinking43(2), 24–32.
- Jones, K. S. (2003). What is an affordance? *Ecological Psychology*, 15(2), 107–114. http://dx.doi.org/10.1207/S15326969ECP01502_1.
- Kaiser, S. (2004). *Qualification requirements in e-government: The need for information systems in public administration education. Vol. 3183*. Springer.
- Ketabchi, E., & Mortazavi, M. (2009). *Use of business intelligence tools for improving e-government processes – Case study: Process of graduation in the University of Tehran*. Reading, UK: Academic Publishing Limited.
- King, S., & Cotterill, S. (2007). Transformational government? The role of information technology in delivering citizen-centric local public services. *Local Government Studies*, 33(3), 333–354. <http://dx.doi.org/10.1080/03003930701289430>.
- Kubicek, H., & Hagen, M. (2000). One stop government in Europe: An overview. In M. Hagen, & H. Kubicek (Eds.), *One stop government in Europe. Results from, 11*. (pp. 1–36) (2000).
- Kuk, G., & Janssen, M. (2013). Assembling infrastructures and business models for service design and innovation. *Information Systems Journal*, 23(5), 445–469.
- Law, K. H., Tadori, S., Lau, G. T., & Kesan, J. P. (2015). An ontology-based approach for retrieving information from disparate sectors in government: The patent system as an exemplar. *Proceedings of the 48th Hawaii international conference on system sciences, Hawaii, USA*.
- Layne, K., & Lee, J. W. (2001). Developing fully functional E-government: A four stage model. *Government Information Quarterly*, 18(2), 122–136.
- Lee, J., & Lee, H. (2014). Developing and validating a citizen-centric typology for smart city services. *Government Information Quarterly*, 31, S93–S105. <http://dx.doi.org/10.1016/j.giq.2014.01.010>.
- Leigh, T. W. (1987). Cognitive selling scripts and sales training. *Journal of Personal Selling & Sales Management*, 7(2), 39–48.
- Leitner, C. (2006). *e-Government: People and skills in Europe's administrations*. Computer Society Press.
- Lenk (1998). Reform opportunities missed: Will the innovative potential of information systems in public administration remain dormant forever? *Information, Communication & Society*, 1(2), 163–181. <http://dx.doi.org/10.1080/13691189809358962>.
- Lenk, K. (2002). Electronic service delivery – A driver of public sector modernisation. *Information Policy: The International Journal of Government & Democracy in the Information Age*, 7(2,3), 87–96.
- Lenk, & Klee-Kruse, G. (2000). *Multifunktionale Serviceläden. Ein Modellkonzept für die öffentliche Verwaltung im Internet-Zeitalter*. Berlin: Edition sigma.
- Lenk, & Schuppan, T. (2011). Einführung von Bürgerservices. *Bürgerservices: Grundlagen-Ausprägungen-Gestaltung-Potentiale* (pp. 211–229). Berlin: Edition sigma.
- Lenk, Brüggemeier, M., Hehmann, M., & Willms, W. (1990). *Bürgerinformationssysteme*. Opladen: Westdeutscher Verlag.
- Liu, N., Gavino, A., & Purao, S. (2014). *A method for designing value-infused citizen services in smart cities*. ACM Press, 34–43. <http://dx.doi.org/10.1145/2612733.2612753>.
- McAuley, E., Duncan, T., & Tammen, V. (1989). Psychometric properties of the intrinsic motivation inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, 60, 48–58.
- Mutzeck, K. (2008). *Kooperative Beratung. Grundlagen und Methoden der Beratung und Supervision im Berufsalltag* (6. Auflage). Weinheim und Basel: Beltz Taschenbuch.
- Novak, J. (2009). MINE, YOURS... OURS? Designing for principal agent collaboration in interactive value creation. *Wirtschaftsinformatik proceedings*. Vienna: AIS (Retrieved from <http://aisel.laisnet.org/wi2009/23/>).
- Nussbaumer, P., & Matter, I. (2011). What you see is what you (can) get? Designing for process transparency in financial advisory encounters. *Human-computer interaction—INTERACT 2011* (pp. 277–294). Springer (Retrieved from http://link.springer.com/chapter/10.1007/978-3-642-23774-4_24).
- Papas, N., O'Keefe, R. M., & Seltikas, P. (2012). The action research vs design science debate: Reflections from an intervention in eGovernment. *European Journal of Information Systems*, 21(2), 147–159.
- Peppers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of Management Information Systems*, 24(3), 45–77. <http://dx.doi.org/10.2753/MIS0742-122240302>.
- Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79–91.
- Prahalad, C. K., & Ramaswamy, V. (2004a). Co-creating unique value with customers. *Strategy & Leadership*, 32(3), 4–9.
- Prahalad, C. K., & Ramaswamy, V. (2004b). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5–14. <http://dx.doi.org/10.1002/dir.20015>.
- Reffat, R. (2003). Developing a successful e-government. *Proceedings of the symposium on E-government: Opportunities and challenge, Muscat municipality, Oman* (pp. IV1–IV13) (Retrieved from http://faculty.kfupm.edu.sa/ARCH/rabee/publications_files/03Reffat_eGov.pdf).
- Rodden, T., Rogers, Y., Halloran, J., & Taylor, I. (2003). Designing novel interactional workspaces to support face to face consultations. *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 57–64).
- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43(3), 450.
- Ryan, R., Mims, V., & Koestner, R. (1983). Relation of reward contingency and interpersonal context to intrinsic motivation: A review and test using cognitive evaluation theory. *Journal of Personality and Social Psychology*, 45(4).
- Saebø, Ø., Rose, J., & Skiftene, Flak, L. (2008). The shape of eParticipation: Characterizing an emerging research area. *Government Information Quarterly*, 25(3), 400–428.
- Saebø, Ø., Flak, L. S., & Sein, M. K. (2011). Understanding the dynamics in e-Participation initiatives: Looking through the genre and stakeholder lenses. *Government Information Quarterly*, 28(3), 416–425.
- Sanati, F., & Lu, J. (2012). An ontology for e-government service integration. *Computer Systems Science and Engineering*, 27(2), 89–101.
- Schedler, K., & Proeller, I. (2000). *New public management*. Bern u.a.
- Schenk, B. (2014). Maßgeschneiderte Bürgerberatung – Ein Beitrag zur Bedarfsklärung für Web 2.0-gestützte Neubürgerberatung. In J. Jähnert, & C. Förster (Eds.), *Technologien für digitale Innovationen* (pp. 147–171). Wiesbaden: Springer Fachmedien Wiesbaden (Retrieved from http://link.springer.com/10.1007/978-3-658-04745-0_7).

- Schenk, B., & Schwabe, G. (2011). *Bürgerservice vor Ort. Bürgerservices (edition sigma)*. Berlin: Gerhard Schwabe.
- Schmidt-Rauch, S., & Nussbaumer, P. (2011). Putting value co-creation into practice: A case for advisory support. *ECIS 2011 proceedings* (Retrieved from <http://aisel.aisnet.org/ecis2011/138>).
- Scholl, Eisenberg, M., Dirks, L., & Carlson, T. S. (2011). The TEDS Framework for Assessing Information Systems From a Human Actors' Perspective: Extending and Repurposing Taylor's Value-Added Model 62(4), 789–804.
- Scholl, & Carlson, T. S. (2012). Professional sports teams on the Web: a comparative study employing the information management perspective. *European Sport Management Quarterly*, 12(2), 137–160.
- Scholl, H. J. (2005a). E-government-induced business process change (BPC): An empirical study of current practices. *International Journal of Electronic Government Research*, 1(2), 27–49.
- Scholl, H. J. (2005b). Motives, strategic approach, objectives & focal areas in e-Gov-induced change. *International Journal of Electronic Government Research*, 1(1), 58–77.
- Scholl, H. J., Kubicek, H., Cimander, R., & Klischewski, R. (2012). Process integration, information sharing, and system interoperation in government: A comparative case analysis. *Government Information Quarterly*, 29(3), 313–323.
- Schuppan (2010). E-government competencies: Looking beyond technology. *Handbook of public information systems* (pp. 353–370).
- Schuppan (2014). *E-government at work level: Skilling or de-skilling?* IEEE, 1927–1934. <http://dx.doi.org/10.1109/HICSS.2014.244>.
- Schuppan (2015). Service workers on the electronic leash? Street-level bureaucrats in emerging information and communication technology work contexts. *Understanding street-level bureaucracy* (pp. 243). Policy Press.
- Schuppan, T., & Reichard, C. (2002). eGovernment: Von der Mode zur Modernisierung. *Landes-Und Kommunalverwaltung (LKV)*, 12(3), 105–110.
- Schwartz, C., & Posse, N. (1986). *Beratung. Pädagogische Psychologie* (pp. 631–666). München: Psychologie Verlags Union.
- Sein, M. K., Henfridsson, O., Purao, S., Rossi, M., & Lindgren, R. (2011). Action design research. *MISQ*, 35(1).
- Shankar, V., Venkatesh, A., Hofacker, C., & Naik, P. (2010). Mobile marketing in the retailing environment: Current insights and future research avenues. *Journal of Interactive Marketing*, 24(2), 111–120. <http://dx.doi.org/10.1016/j.intmar.2010.02.006>.
- Simon, H. A., Dantzig, G. B., Hogarth, R., Platt, C. R., Raiffa, H., Schelling, T. C., ... Winter, S. (1987). Decision making and problem solving. *Interfaces*, 17(5), 11–31.
- Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal*, 1442–1465.
- Steinmetz, U. (2011). Bürgerservice am Telefon. *Bürgerservices: Grundlagen-Ausprägungen-Gestaltung-Potentiale*. Edition sigma.
- Stoffregen, T. A. (2003). Affordances as properties of the animal-environment system. *Ecological Psychology*, 15(2), 115–134.
- Todevski, M., Janeska-Sarkanjac, S., & Trajanov, D. (2013). Analysis of introducing one stop shop administrative services: A case study of the Republic of Macedonia. *Transylvanian Review of Administrative Sciences*, 38E, 180–201.
- Torres, L., Pina, V., & Acerete, B. (2005). E-government developments on delivering public services among EU cities. *Government Information Quarterly*, 22(2), 217–238.
- United Nations, & Department of Economic and Social Affairs (2014s). *United Nations e-government survey 2014: e-Government for the future we want*. New York: United Nations.
- Valenduc, G., Vendramin, P., Krings, B., & Nierling, L. (2007). How restructuring is changing occupations? Case study evidence from knowledge-intensive, manufacturing and service occupations. Retrieved from <http://www.econstor.eu/handle/10419/67055>
- Van de Ven, A. H., & Johnson, P. E. (2006). Knowledge for theory and practice. *Academy of Management Review*, 31(4), 802–821.
- van Veenstra, A. F. V., Klievink, B., & Janssen, M. (2011). Barriers and impediments to transformational government: Insights from literature and practice. *Electronic Government, an International Journal*, 8(2/3), 226–241.
- van Velsen, L., van der Geest, T., ter Hedde, M., & Derks, W. (2009). Requirements engineering for e-Government services: A citizen-centric approach and case study. *Government Information Quarterly*, 26(3), 477–486.
- Vom Brocke, J., Simons, A., Niehaves, B., Riemer, K., Plattfaut, R., Cleven, A., et al. (2009). Reconstructing the giant: On the importance of rigour in documenting the literature search process. *ECIS*, Vol. 9. (pp. 2206–2217) (Retrieved from <http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1145&context=ecis2009>).
- Warschburger, P. (2009). *Beratungspsychologie*. Heidelberg: Springer.
- Weerakkody, Dhillon, G., Dwivedi, Y., & Currie, W. (2008). Realising transformational stage e-government: Challenges, issues and complexities. Retrieved from <http://aisel.aisnet.org/amcis2008/181/>
- Weerakkody, Janssen, M., & Dwivedi, Y. K. (2011). Transformational change and business process reengineering (BPR): Lessons from the British and Dutch public sector. *Government Information Quarterly*, 28(3), 320–328.
- Weerakkody, V., El-Haddadeh, R., Sabol, T., Ghoneim, A., & Dzupka, P. (2012). E-government implementation strategies in developed and transition economies: A comparative study. *International Journal of Information Management*, 32(1), 66–74.
- Wimmer, M. (2002). Integrated service modelling for online one-stop government. *Electronic Markets*, 12(3), 149–156.
- Wright, B. E. (2007). Public service and motivation: Does mission matter? *Public Administration Review*, 67(1), 54–64.
- Young, L. D. (2003). Bridging theory and practice: Developing guidelines to facilitate the design of computer-based learning environments. *Canadian Journal of Learning and Technology/La Revue Canadienne de L'apprentissage et de La Technologie*, 29(3) (Retrieved from <http://www.cjlt.ca/index.php/cjlt/article/viewArticle/90>).
- Zillien, N. (2008). Das Affordanzkonzept in der Mediensoziologie. *Sociologia Internationalis*, 46, 161–181.
- Zomerdiijk, L. G., & Voss, C. A. (2010). Service design for experience-centric services. *Journal of Service Research*, 13(1), 67–82. <http://dx.doi.org/10.1177/1094670509351960>.