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Service encounter thinklets: how to empower service agents to put value co-creation into practice Service encounter thinklets

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Keywords: value co-creation, collaboration engineering, thinkLets, action design research, service design

1. Introduction

The concept of value co-creation and the service encounter as locus of such value co-creation gained much academic interest, notably in marketing research and service sciences. In these bodies of literature, the conceptual shift from organization-centric service provision to co-productive customer-organization interactions has been discussed extensively. The scientific discussions focus on the fundamental premises of value co-creation as a key part of the relationship between clients and organizations, highlighting their effects on the service encounter, service systems, and service science (Grönroos, 2008; Prahalad and Ramaswamy, 2004a; Vargo et al., 2008; Vargo and Lusch, 2004). These discussions provide conceptual insights into client-organization relationships and the service encounter as the locus of value co-creation. However, there are few insights and suggestions on how organizations, or service agents as their representatives, can establish co-creation of value.

Also numerous information systems (IS) researchers have extensively discussed how to improve advisory service encounters with suitably designed IT artifacts to establish value co-creation experiences (e.g., Carter and Bélanger, 2005; Giesbrecht et al., 2014; Kira et al., 2009; Kuk and

Janssen, 2013; Novak, 2009; Nussbaumer et al., 2012; Rodden et al., 2003; Schmidt-Rauch and Schwabe, 2011). They address aspects such as communication, relationship-building, trust, or accessibility, and show how to design technical information systems to improve collaboration in service encounters. They thus elaborate on the technical designs of developed IS solutions, and describe design requirements and principles. However, they provide few insights on the work practices and social interaction patterns necessary that users need to follow to make effective use thereof. The effects of a lack of information about information systems' social component can be far-reaching: Researchers can be severely hampered to repeat experiments to verify scientific results or to conduct another design iteration. Also, service-providing organizations can struggle to make beneficial use of research results, since essential knowledge for successful IS solutions deployment is missing. Reviewing design-oriented IS research literature in the context of advisory service encounters has revealed that previous studies mostly do not provide sufficient information on the central role of service agents' work practices, qualifications, and influences on the success of an information system to establish co-creation experiences in service encounters.

We seek to bridge these gaps and answer the research question: how can service agents be empowered to establish co-creative interactions in their IT-supported service encounters with clients? Establishing corresponding co-creative service encounters could allow for more individualized service configurations and can thereby increase service quality and customer satisfaction (Schmidt-Rauch and Nussbaumer, 2011). We introduce service encounter thinkLets (SETs) as suitable means to qualify service personnel on the job, as the core design artifact in our research. SETs are scripted collaboration techniques used by service personnel for the fruitful and repeated invocation of collaboration patterns in IT-supported advisory service encounters. In combination with corresponding IT-based support, SETs can help advisors to effectively create co-creative service encounters (COSE).

Our research contributes to the discourse on service encounters within IS (e.g., Kira et al., 2009; Novak, 2009; Nussbaumer et al., 2012; Rodden et al., 2003; Schmidt-Rauch and Schwabe, 2011, 2014), highlighting how information systems could be designed and deployed to help users establish co-creation experiences in advisory service encounters. We also contribute to research on collaboration engineering (Briggs et al., 2001, 2003; De Vreede et al., 2006), showing how the concept of thinkLets can be successfully adapted to dyadic collaborations. Further, we provide practitioners in service organizations with IS implementation guidelines to support value co-creation in customer service encounters.

2. Value Co-creation in the Advisory Service Encounter

The underlying service-dominant logic describes the concept of value co-creation as a shift from an organization-centric or product-centric perspective on service provision to one of organizations

and clients co-creating value with each other in their interactions. Prahalad and Ramaswamy (2004a, 2004b), for instance, describe service delivery as *co-creation experience*. They argue that organizations need to establish co-creation experiences in their client-organization interactions in order to co-create value with clients. Payne et al. (2008) describe specific *value-creating processes* for customer involvement, placing clients on the same importance level as the organization. With the description of these processes and their interrelationships, they provide a framework to manage the value co-creation process. In a similar approach, Grönroos and Voima (2013) emphasize the importance of providing *value co-creating opportunities* in the service delivery process. They introduce three value creation *spheres* and elaborate on clients and service provider value (co-)creating roles in each of these. However, regarding the scientific value co-creation discourse in service science, IS, or marketing research, researchers are mostly concerned with the fundamental premises and concepts (Grönroos, 2008; Vargo et al., 2008; Vargo and Lusch, 2004) and their implications on service systems or service science (Grönroos, 2011; Grönroos and Voima, 2013; Maglio and Spohrer, 2007; Needham, 2008; Spohrer and Maglio, 2008). As a result, there has been little scientific discussion on how organizations, specifically the service agents as the organization's representatives, could put value co-creation into practice.

The advisory service encounter is a prime example of a co-creative service encounter (Schmidt-Rauch and Nussbaumer, 2011). Originating in psychology, advisory services' principal objective is to enable clients to resolve their problems on their own (Schwartzer and Posse, 1986; Warschburger, 2009). In the advisory service encounter, the value is principally co-created: Advisors and clients must both provide distinct information and must participate actively in the collaboration in order to develop solutions. In this situation, service personnel must become distinctive advisors, involving their clients in structured problem-solving activities (Giesbrecht et al., 2014) and must provide co-creation opportunities (Payne et al., 2008; Prahalad and Ramaswamy, 2004a). Employees have the role of facilitators who possess the necessary professional knowledge as well as the methodological and personal skills to i) guide their clients through a structured problem-solving process, ii) suitably apply available tools and information resources in this process, while c) establishing a close relationship with the clients (Giesbrecht et al., 2014). The advisors are responsible to actively involve the clients in the value creation process and to establish value co-creation experiences (Grönroos and Voima, 2013; Prahalad and Ramaswamy, 2004a, 2004b).

However, value co-creation experiences are not established automatically. Each phase in the advisory process requires the participants to play their role as co-creators.

The advisory process, as a decision-making process, could suitably be described in the three phases of Simon's process for decision-making (Simon et al., 1987): *intelligence* (where needs

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for a decision are identified and required background information is collected), *design* (where possible solutions are developed), and *choice* (where the solutions are evaluated and the most suitable one is chosen).

Value co-creation in the intelligence phase: Advisors and clients need to start a joint problem-solving process (Schmidt-Rauch and Schwabe, 2011) to establish a shared understanding of a client's needs. These needs can be fairly fuzzy and sticky, being accessible only to the clients themselves (Schmidt-Rauch and Nussbaumer, 2011). Thus, the advisors must establish an active dialog, with mutual information exchange between them and the clients as equal and joint problem-solvers in order to develop a problem statement that is clear to both parties (Prahalad and Ramaswamy, 2004a). In these activities, the advisors need the methodological skills to make appropriate use of available tools and information resources to support the cooperative elicitation of the client's needs.

Value co-creation in the design phase: The clients are assumed to have little knowledge about possible solutions to their problems and the process of finding them. Accordingly, the advisors must exert their domain knowledge to develop suitable solutions. However, according to Sandström et al. (2008), value (here: solutions) will not be gained until the clients have actively taken part in the development process. In this context, advisors must provide the clients with the same access to and the same transparency of the available information. They need to exert the necessary methodological skills to guide clients through problem-solving activities, particularly their usage of tools and information resources.

Value co-creation in the choice phase: To establish a co-creation experience, advisors must actively integrate the client into the evaluation of the developed possible solutions. They need to support them to develop evaluation criteria and to assess the risks and benefits related to the solutions, so that they can eventually choose the most suitable solution.

Design-oriented IS research has also recognized the importance of establishing value co-creation in service encounters. Numerous researchers have investigated the collaboration within face-to-face advisory encounters, highlighting the supportive role of technological artifacts. Rodden et al. (2003), for instance, investigated how to design an interactional workspace for more effective face-to-face collaboration between customers and agents. Kira et al. (2009) compared face-to-face and telephone advisory encounters to investigate technical information systems' various characteristics for improving advisor-client collaboration. Schmidt-Rauch and Nussbaumer (2011) introduced four guiding perspectives for the design of supportive IT artifacts: service encounters as learning process, as design process, as collaboration, and as experience. And Schmidt-Rauch and Schwabe (2014) describe how value co-creation can be maintained after the face-to-face encounter and introduce design requirements for creating supporting IT artifacts to resolve occurring problems, namely the problem of being limited to verbal dialog, of the stickiness of

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information needs, of diverging goals, and the burden-of-choice problem. Nussbaumer et al. (2012, 2009) discuss how to design IT artifacts to resolve occurring information asymmetries. And Heinrich et al. (2014) investigated how to enhance relationship-building in advisory encounters via tabletop systems. However, these research studies primarily focus on describing the technical components of developed IT artifacts and neglect the actors' work practices when applying their solutions.

Peffers and Tuunanen (2005) show how to plan IT applications for better user adoption. From a managerial perspective, they develop an IS planning method based on critical success chains. Similarly, Kuk and Janssen (2013) investigate the planning and design of services. While comparing front-end and back-end approaches to service design, they highlight advantages and disadvantages regarding quickness of service introduction, service mutability, and business model coherence. Carter and Belanger (2005) develop an elaborate model of factors, influencing service adoption, focusing on the clients and their perceptions of eGovernment services. Their model may help one to plan and implement new services to be adopted by clients. However, all these studies barely consider the perspective of the front office employees, their roles in the acceptance of such service innovations regarding acceptance and adoption, and how they could facilitate clients' adoption of novel services.

In sum, previous studies in IS research that investigate the planning of IS application for supporting advisory service encounters or their technical design provide few insights into how advisors have applied corresponding IT artifacts to establish co-creation experiences. As a result, researchers struggle to repeat experiments and evaluations to confirm scientific results or even to conduct further design iterations to improve system design. Furthermore, service-providing organizations can rarely benefit from corresponding research results, not knowing how to communicate appropriate work practices to their service personnel along with introducing novel supportive IT artifacts. In this context, we argue that we currently lack a suitable solution that would provide researchers with guidance on how to describe such work practices and social interaction patterns.

3. Research design

The research question on how service agents could be empowered to establish co-creative service encounters was part of a larger research project in which a novel citizen advisory service is developed and implemented in the front office of the public administration of a major German city, and its technical and organizational effects are investigated. In this research project and this paper, we follow the activities of action design research (ADR) proposed by Sein et al. (2011), that is, I. problem formulation, II. building, intervention, and evaluation, III. reflection and learning, and IV. formalization of learning. In the individual stages, we focus on data collection, findings,

and deductions relating to the service encounter and advisors' capabilities. The ADR approach, which promotes a close researcher-practitioner relationship, suits our research well, since it helps to bring together the theoretical perspective from the current state of research on value co-creation and the practical perspective of service providers, including their service agents' work practices. We also respond to the call by Van de Ven and Johnson (2006, p. 802) to "not only enhance the relevance of research for practice but also contribute significantly to advancing research knowledge" in service science and IS research. In this paper, we address the individual stages of ADR in the following sections:

Problem description (addressing I. problem formulation): We report from an exploratory study to identify advisors' most influential deficiencies concerning putting value co-creation into practice despite technical advisory support. We observed six advisors giving advice to 12 clients in IT-supported advisory encounters and analyzed their behaviors (for details of the study's design and methods, see Section 4.2 and appendix A1). Through a detailed analysis of interviews and participants' responses, we identified occurring problems and deficiencies, ultimately externalizing them in corresponding solution objectives as they emerged from the organizational context.

Solution description (addressing II. building): Based on the problem description, we analyzed prior collaboration engineering research work, identifying the concept of thinkLets (Briggs et al., 2001, 2003; De Vreede et al., 2006) to inform our solution artifact's design (*theory-ingrained artifact* principles; Sein et al., 2011, p. 40). Reflecting on this concept and including insights from the organizational context caused us to rethink the initial advisory support. Our findings suggest complementing the technical support approach with a social component. For this purpose, we adapted the thinkLets concept and created *service encounter thinkLets (SETs).* They are this paper's core design artifact (see Section 5). For implementing the solution design (i.e. complementing the technical support approach with SETs), we followed a scenario-based development approach (Rosson and Carroll, 2002), including periodical formative evaluations with end-users and workshops with project team members. While doing so, we repeatedly reflected on design decisions, focusing on fulfilling the solution objectives.

Evaluation (addressing II. intervention and evaluation): We evaluated the solution in a user test in the organizational context conducted in the same organization as the problem identification study. This setting increases the external validity of our finding. In doing so, practitioners were included and had opportunities to influence the design of the solution's instantiation (*mutually influential role principles*; Sein et al., 2011, p. 43). In ADR, while the evaluation settings could not always be controlled completely, but Sein et al. emphasize that authenticity constitutes "a more important ingredient for action design research than controlled settings" (*authentic and concurrent evaluation* principle; Sein et al., 2011, pp. 43, 44). The details of the user test and the evaluation methods are described in Section 6.

Discussion and conclusion (addressing III. reflection and learning and IV. formalization of learning): In reflecting on the evaluation's findings, we generalize our design research outcomes. We introduce the *COSE artifact*, which combines technical and social advisory support approaches and describes their interrelations for successful application (*generalized outcomes* principle; Sein et al., 2011, p. 40). Thereby, the solution objectives, the conceptual description of an SET with its essential components (described in Section 5), and the link between SETs and counseling affordances represent the core design principles we developed in our research. We discuss transferability of our solution approach and highlight our solution's added value for research and practice. We also articulate learning from our research in light of the kernel theory selected, i.e. the concept of thinkLets from collaboration engineering. We conclude with an outlook.

4. Advisors' Deficiencies to Put Value Co-creation into Practice

Advisors face a number of challenges to establish co-creative interactions with their clients, and these challenges can also exceed the supportive capabilities of technical support provided by corresponding IT artifacts. We highlight these challenges by reporting from our research on IT-supported citizen advisory services in a public administration's front office, conducted in January 2013.

We observed the advisors in their current work practices and used Prahalad and Ramaswamy's DART model (Prahalad and Ramaswamy, 2004a, 2004b) as guidelines to investigate how they applied or did not apply co-creative work practices. The DART model (Prahalad and Ramaswamy, 2004a, 2004b) describes the building blocks of interactions that facilitate co-creation experiences. Therein, a *dialog* needs to be established between advisors and clients to define and resolve client problems. An active dialog implies interactivity and the ability and willingness to act on both sides (Prahalad and Ramaswamy, 2004a, p. 9). However, to establishing an active dialog, advisors and clients must become joint problem-solvers with equal rights. To enable both parties to actively participate as co-creators in the interaction, existing information asymmetries need to be reduced; Prahalad and Ramaswamy argue that they need the same *access* and equal *transparency* to information. Implementing dialog, access, and *transparency* can assist clients in assessing the *risks and benefits* of a specific decision, making them informed decision-makers and taking more responsibility for the co-created service or product. We argue that the DART model, with its building blocks for co-creative interactions, is suitable to investigate the collaborative behaviors of service personnel regarding their (lack of) efforts to establish value co-creation experiences.

4.1. The Case of IT-supported Citizens' Advisory Services

In citizen advisory services, administrative clerks give advice to citizens in face-to-face service encounters in public administrations' front offices. These employees rarely have extensive training as advisors, but possess profound domain knowledge as well as work experience to help citizens with their government-related issues. We focused on advisory sessions in which citizens with more complex information needs request advisory services, i.e. new inhabitants of a city who in their social situation have similar (missing) prior knowledge about local government-specific administrative issues. The study sought to empower the advisors in their advisory-related skills, specifically their skills as facilitators in the problem-solving collaboration with clients (see Section 2). Therefore, we supported the advisors by an IT artifact that provides *counseling affordances* called *Citizenexplorer*. Counseling affordances describe specific functionalities included in an IT artifact that encourages its users to display advice-giving behavior (for details on functions and effects, see Giesbrecht et al., 2015). The individual counseling affordances provided technical support to the advisors a) to establish a structured advisory process, b) to apply appropriate tools and information resources during the individual problem-solving activities, and c) to maintain close relationships with clients. We will now explain the individual counseling affordances, including their supportive effects on advisors.

Figure 1: Physical Positions in the Artifact-supported Advisory Session (advisor – right, client – left, and the IT tool – on the table).

The first counseling affordance, a *shared information space,* was physically established to help advisors and clients form a collaboration of equal counterparts in which both are able to monitor and access tools and information (see Figure 1). To assist advisors in applying the appropriate tools and information resources in the individual problem-solving activities, *Citizenexplorer* provides connected *problem-solving spaces* (counseling affordance 2). A problem space and a solution space is provided (see Figure 2), each containing tools and information resources that suit the activity in question. To help advisors structure the advisory session more explicitly,

Citizenexplorer provides *slight process change bumps* (counseling affordance 3). Therewith, advisors need to make transitions between activities more purposeful and thus more visible to the clients. In our instantiation, this is accomplished by using a sliding mechanism, with users able to change between the two spaces by sliding the screen to the left or the right (only one space is visible at a time). To promote collaborative interactions between advisors and clients, *Citizenexplorer offers collaboration material and corresponding tools by using well-known metaphors* (counseling affordance 4). For instance, in the needs elicitation phase, *Citizenexplorer* provides a tag cloud containing words most often used to address clients' needs and an empty area to be filled with these tags (see Figure 2, on the left). Finally, to support advisors in integrating available tools and information resources in the appropriate problem-solving activities, *Citizenexplorer enwraps existing tools and information resources and includes them in the advisor-client collaboration* (counseling affordance 5).
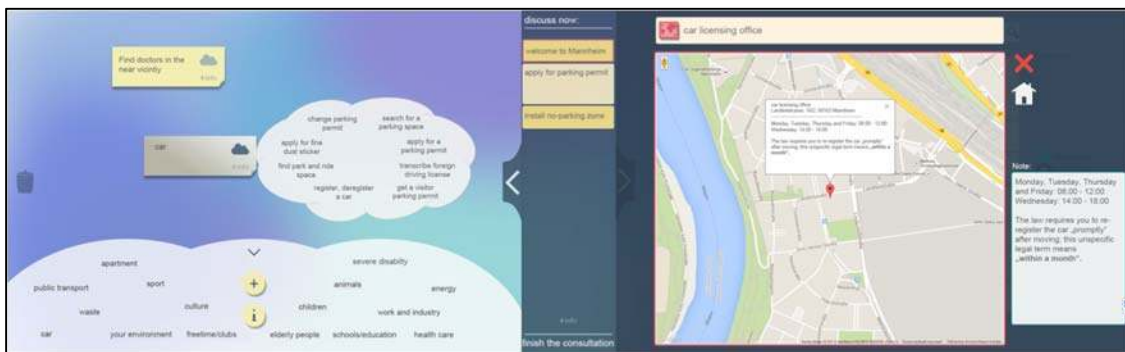

Figure 2: *Citizenexplorer*'s Problem Space Screen (left) and Solution Space Screen (right) (only one screen is visible to the user at a time) (Giesbrecht et al., 2015).[1]

4.2. Insight on Current (non-)Co-creative Work Practices

In a user test with six advisors and 12 clients conducted in a within-subject test design, we observed different key shortcomings in advisors' current work practices. (Details of the evaluation design and metrics are explained in appendix A1.)

In general, our observations revealed that in all their advisory sessions (artifact-supported as well as conventional), advisors did not manage to create a participatory work environment, to closely collaborate with clients, or to integrate them in co-creative activities. The client feedback confirmed our observations rated their personal involvement in the value creation process as moderate (4.7

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[1] Figure 2 depicts the final version of the *Citizenexplorer* prototype. The difference to the first version is not relevant for the purpose of this paper. Due to space limitations we had to limit ourselves to one illustration of the *Citizenexplorer* for the whole paper.

in the conventional and 5.1 in the artifact-supported advisory sessions; 7 = pos. max.). They also rated their relatedness to the advisors not significantly different from neutral (4.4 in the artifact-supported sessions and 4.6 in the conventional sessions; 4 = neutral). In the interviews, the clients emphasized the impersonal atmosphere of the advisory sessions. One client stated: "The advisory session appeared quite impersonal to me […] I had the feeling of being outside." (All quotes were translated to English by the authors.) A closer examination of the advisors' behavior in the individual phases of the advisory process revealed a number of deficiencies when establishing co-creative interaction.

4.2.1. Missing role understanding and role taking

Despite the intensive use of available IT during the advisory sessions, only one advisor explicitly introduced the tool with its meaning for their collaboration to the client. We observed the same behavior in the conventional sessions, where none of the advisors introduced the clients to any of the tools or media they used, such as the register of residents. The resulting asymmetry between advisors and clients regarding access to and use of information during their service encounter (*access* and *transparency* issues) hampered the creation of a co-creative work atmosphere severely. Furthermore, advisors created a false role expectation, with far-reaching consequences: Without this tool being introduced, clients were unable to participate actively whenever advisors used these tools. This increased the unwanted role allocation of clients as consumers and advisors as producers, rather than as equal co-creators. In the interviews, advisors gave reasons for their behavior, describing their uncertainty about when to involve clients. Five out of eight clients also remarked on this uncertainty, noting that it prevented them from being more active and collaborating more. One client noted: "It seemed to me that I could or should also interact with the tool. I would have liked to participate […] but the advisor didn't seem to want it, or did she?" We refer to this problem of the advisors as *a lack of role understanding and role-taking* (**P1**).

Why counseling affordances did not suffice: At the start of the sessions, the advisors had to put effort into establishing an appropriate work relationship with the client. Technical functionalities to support the users in this phase should be subtle, since they can quickly harm the creation of the advisor-client relationship and can be perceived as a communication barrier (Rodden et al., 2003). While the actors received support in the form of a *shared information space*, the advisors failed to take on their role as active co-creators and struggled with the underlying concept of equal co-creators. In the interviews, they stated that it would increase their vulnerability to clients rather than enable closer collaboration. One advisor noted: "I am not fond of the shared space, because the client can see when I can't find the right information at the first attempt."

4.2.2. Missing Knowledge about Collaborative Tool Usage

To facilitate value co-creation, advisors and clients should be able to collaboratively use the available tools and information resources (addressing *access*). However, in the observed advisory sessions, advisors mostly stayed with a single usage mode and struggled to integrate the clients into collaborative usage, for instance into the usage of the register of residence when searching for information. Only two advisors actively included the client while operating the IT tool in the artifact-supported sessions. In the conventional sessions, none of the advisors included clients in their IT usage activities. Advisors gave reasons for their behavior, mentioning, for instance, "I did it as I do it at the service desk […] performing transactions […] It's not easy to switch modes." and "It didn't occur to me that she [the client] wanted to participate […]". The advisors' corresponding behavior may foster information asymmetry and can prevent clients from becoming equal co-creators. We even observed that advisors transformed initially co-creative interactions back into product-centric ones: The advisors would often start an intensive discussion with the client, working towards a shared understanding of for instance a possible solution to the client's needs, but would unexpectedly stop the conversation when using an information system and would only return to the client to present the final solution (*dialog* issue). In these frequent situations, the advisors failed to facilitate and explain their tool usage and did not invite the clients to actively participate (*access* and *transparency* issues). The clients explicitly referred to the advisors' behaviors, describing that the tools that were used became more of a communication barrier. We refer to this problem as *missing knowledge on collaborative tool usage* (**P2**).

Why counseling affordances did not suffice: To establish co-creative interactions, advisors and clients need to be encouraged to actively interact with the available tools and information resources. The technical counseling affordances would have to provide corresponding instructions to both parties separately, which could easily disrupt the mutual information exchange and could impede co-creative work.

4.2.3. Missing knowledge about co-creative work processes

In all sessions' *design* phase, the six advisors revealed the same behavior: They first used the available information system (e.g. a register of residence or a leaflet) on their own to identify a suitable solution and then turned to the client to explain the solutions. In doing so, the advisors used one-way information provision more than co-creative discussions (*dialog* issue). With their communicative behavior, advisors also hindered clients from comprehensively assessing the presented solution information (*risk assessment* issue). In the interviews, four advisors gave similar explanations: Without prior knowledge about the outcome of the solution-finding process, they did not want the clients to participate, since they feared losing control. This exemplifies the advisors' traditional way of thinking as producers (referring to P1). Furthermore, it highlights the

advisors' need for specific process knowledge to perform collaborative activities: They need some information about benefits and outcomes of collaborative activities in order to perform them properly. Without this knowledge, advisors will most likely stay with their traditional work practices. We refer to this problem as *missing knowledge on co-creative work processes* (**P3**).

Why counseling affordances did not suffice: The advisors could use the IT tool's problem-solving spaces and the explicit transition activities between them (counseling affordances 2 and 3) to establish a more structured advisory process. However, IT tool cannot enforce an entire collaborative solution-finding process. Any technical means to impose a corresponding process would have severe negative effects on advisor-client collaboration.

In sum, citizen advisors revealed a number of deficiencies occurring in their current work practices regarding establishing co-creative interaction, which also exceeded the support provided by technical counseling affordances. Thus, from the identified problems P1 to P3 we derive the following three solution objectives to extend existing technical approaches, to help citizen advisors to putting value co-creation into practice:

Solution objective SO1 (addressing P1): Support the advisors in internalizing the role allocation of advisors and clients as co-creators of the advisory's value and to show the corresponding co-creative behavior during the advisory service encounter.

Solution objective SO2 (addressing P2): Enable the advisors to use available tools and information resources as an integral part of their co-creative work practices.

Solution objective SO3 (addressing P3): Provide guidance for the advisors to decide when to apply co-creative work practices that suit each phase in the advisory process and what outcomes to expect from these work practices.

Advisors need to develop the corresponding skills for establishing co-creation experiences. Traditional qualification measures rarely fit this task (e.g. peer-to-peer learning) or are too expensive owing to additional teaching resources needed. These problems can be found in the context of citizen services in public administrations (cf. Giesbrecht et al., 2011, 2014) as well as in other domains, such as financial advisory services (e.g. Oehler and Kohlert, 2009; Schwabe and Nussbaumer, 2009).

5. Service Encounter ThinkLets to enable Value Co-creation in Advisory Service Encounters

As illustrated, advisors need to learn how to establish co-creative work practices in their service encounters. The advisors' deficiencies (see P1 to P3) revealed their lack of collaborative knowledge or their lack of facilitation skills to establish co-creative interactions.

Service-providing organizations know about the importance of a high-quality IT-supported service provision as their competitive advantage and constantly develop their service personnel's skills. Limited budgets require organizations to apply methods that require fewer resources. One of the most common methods in organizations is to develop scripts describing desired courses of action and to provide service staff with precise instructions, for instance, communication scripts used in call centers (cf. Deery et al., 2002; Holman, 2002; Sawyerr et al., 2009). While corresponding approaches help service staff to apply new knowledge in their customer interactions, they hardly allow them to deviate from given instructions. As a result, employees are unable to personalize the service encounter to the client's needs. Furthermore, the necessity of following scripts can intensify the problem of differing goals between advisors and clients (Schmidt-Rauch and Nussbaumer, 2011). This can severely hamper symmetric conversation and information exchange in a transparent dialog, which are essential building blocks of co-creative interactions. How can service staff be provided with knowledge to establish active dialog between equal actors and ultimately establish co-creative interactions?

5.1. Solution: Service encounter thinkLets

Briggs et al. developed the concept of thinkLets to provide practitioners with necessary collaboration knowledge to enable them to establish fruitful IT-supported collaboration. Coming from the collaboration engineering research area, Briggs et al. introduced thinkLets in 2001 in reaction to the often complex nature of group support systems (Briggs et al., 2001, 2003; Kolfschoten et al., 2006; De Vreede et al., 2006). They wanted to enable practitioners – rather than expert facilitators – to induce fruitful collaboration. A thinkLet can be defined as a "named, scripted collaboration technique for predictably and repeatedly invoking known patterns of collaboration among people working together toward a goal" (Briggs et al., 2009, p. 6). Accordingly, novice facilitators can use thinkLets as learning modules of facilitation techniques (Kolfschoten et al., 2006) and can thus enhance their facilitation skills. A thinkLet provides explicit instructions and prompts for invoking a certain collaboration pattern along with instructions on how to configure and use supportive tools and technologies. Concretely, a thinkLet consists of these principal components: the name, the facilitation script, and the tools used with their configuration (for detailed descriptions, see Briggs et al., 2003).

ThinkLets enable non-expert facilitators to establish fruitful collaboration in group work. The occurring collaborations in advisory sessions fit the patterns of collaboration that emerge in group work, i.e. generate, clarify, organize, evaluate, reduce, and build commitment (Briggs et al., 2009; De Vreede et al., 2006). Accordingly, thinkLets have a strong potential to support advisors in the individual phases of their problem-solving process to establish the desired co-creative interactions with clients. We argue that thinkLets can be adapted to account for the advisory service

encounters' special characteristics, specifically the advisors' deficiencies to establish co-creative interactions (see P1 to P3). Thus, we revised the components of thinkLets to address the solution objectives SO1 to SO3. We refer to the resulting adapted thinkLets as *service encounter thinkLets* (SETs). As a result, an SET contains the following components:

Name: An SET, analogously to a thinkLet, should contain a name or identifier. With the SET's name, advisors can identify the individual service encounter thinkLet, which can help them link it to the problem-solving activity in question, which they should perform in a co-creative manner (addressing SO3).

Script: Analogously to a thinkLet, the script in an SET contains an overview of the SET-induced collaboration pattern, with its goals as well as the instructions and prompts how advisors can establish specific co-creative interactions, including advisors' role-related behavior. The script in the SET also needs to account for the advisors' double role as facilitator and co-creator in the service encounter. It needs to instruct advisors on how to behave in each role and how and when to switch from facilitator (directing the advisory process) to co-creator (closely collaborating with a client on the same level) (addressing SO1). Furthermore, the script needs to include instructions on how to operate tools and information resources (i.e. the technical counseling affordances) in order to make them an integral part of co-creative interactions (addressing SO2).

Tools and configuration: Analogously to thinkLets, SETs, together with the technical counseling affordances, help advisors to establish fruitful collaboration in service encounters. In doing so, an SET describes the hardware and software used to establish the SET-based collaboration and how they should be configured (addressing the technical aspect of SO2).

Advisors must align their behaviors with each client in order to provide personalized advisory service. They need the flexibility and discretion to adjust the individual activities to a client's needs. However, standard thinkLets – designed by collaboration engineers as prescriptive practices, predefining the collaboration's structure, without alteration by practitioners. Recent research showed that measures that hamper advisors in customizing the process, e.g., communication scripts, can increase employees' role stress and emotional exhaustion, and can – ultimately – impede work performance (cf. Deery et al., 2002; Holman, 2002; De Ruyter et al., 2001; Sawyerr et al., 2009). Therefore, we add a further element to our notion of SETs:

Decision guidance: To personalize the advisory service encounter, advisors must make short-term decisions about which SET-supported interaction to invoke in what problem-solving activity. Furthermore, advisors – in their simultaneous role as facilitators and as co-creators – need to know when to stop facilitating (e.g. explaining the steps of problem-solving activities to the client) and when to start establishing co-creation activities and become co-creators (e.g. when searching and discussing possible solutions with the client). To support these decisions,

an SET should provide information about the concrete collaboration pattern and which collaborative behavior and outcome are to be expected (addressing SO3).

The descriptive nature of SETs and the predictability of resulting group behavior can help to lower the barriers for advisors to put value co-creation into practice: SETs can support the advisors to learn about the utilization of co-creative interactions via guided execution of SET-based collaborations. Figure 3 depicts an exemplary SET for the advisory session's *intelligence* activity, i.e. the collaborative elicitation of a client's needs. In our instantiation, it should be used with the corresponding counseling affordance, i.e. the *problem space* screen with its tag cloud functionality (the instantiation can be seen in see Figure 2, on the left).

Figure 3. An exemplary SET for "elicit needs with the cloud" (design adapted from the presentation of a thinkLet; Briggs et al., 2001).

6. Evaluation

We conducted a user test to evaluate how our solution approach of SETs combined with the technical counseling affordances contributes to achieving the solution objectives SO1 to SO3. We conducted the user test in the same organizational context as the problem identification study (see Section 4).

6.1. Evaluation design

The user test was in a within-subject test design, where 12 advisors gave advice to 36 'new-in-town' clients in 72 advisory sessions. The 12 advisors were real citizen advisors in the public

administration of the same major German city, but not the same employees as in the problem description study. To have a group of participating clients analogous to the problem identification study (see Section 4), they were recruited among the usual clients of the public administration from cities other than the one we worked with. Thus, they could take on the role of new inhabitants more easily, having a similar (low) prior knowledge of city-specific administrative issues and processes. The nine female and three male advisors were between 19 and 57 years old (average: 31.3) and the 22 female and 14 male clients were between 18 and 56 years old (average: 27). In the test, we compared conventional with SET-supported advisory sessions. In the conventional advisory sessions, advisors gave advice as they usually do in their daily work. In the SET-supported sessions, advisors where supported by the counseling affordances and SETs. Accordingly, the test was designed as follows: 1) the advisor received a refresh on the basic objectives of citizen advisory services to ensure an equal state of knowledge among the advisors. 2) The advisors conducted a conventional advisory session. 3) In a five-hour training episode, the advisors became acquainted with the SETs for the individual problem-solving activities: They read the SETs and tried them out in a role- play using the IT tool providing the counseling affordances. 4) The advisors conducted three SET-supported and three conventional advisory sessions in alternating order. The test design allowed us to observe the differences in the advisors' collaborative behaviors as well as to receive their feedback on perceived differences. Each client experienced a conventional as well as an SET-supported advisory session in order to report on the differences. To assess the advisors' changing advice-giving behaviors, we compared their first conventional advisory session (before the training episode) with their last SET-supported advisory session. In our ADR approach, we benefited from working and evaluating in a real organizational context (improving external validity). Giving credence to this fact, we slightly revised the IT tool to comply with practitioners' requests: The content was updated and individual components of the tool were slightly modified. However, none of the counseling affordances were substantially altered in order to assure that the IT tool provides the same support as in the first evaluation (see Section 4).

6.2. Data Collection

To evaluate the advisors during their service encounters in terms of the solution objectives (SO1 to SO3), the data collection comprised observations, interviews, and a questionnaire.

First, all advisory sessions were recorded on video. These recordings were coded and analyzed by two researchers to identify and assess the advisors' behaviors regarding the building blocks for co-creative interactions from the DART model (Prahalad and Ramaswamy, 2004a, 2004b; for a detailed description, see Section 4): in detail, we assessed how the advisors: i) established active dialog with the clients (measurement of advisor-client talk time), ii) provided equal access

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to transparent information (identification of corresponding statements of invitation and explanation by advisors), and iii) supported clients in assessing the risks and benefits of their decisions (identification of corresponding discussions).

Second, we conducted semi-structured interviews with all advisors and clients to learn about the underlying reasons and motivations for their behavior during the different advisory sessions. Thus, the interview guidelines consisted of questions concerning perceptions of involvement in the value creation process, satisfaction with the advisory service, and perceptions of how the advisors implemented the individual building blocks for co-creative interactions from the DART model. The interviews lasted 35 minutes on average.

Third, advisors and clients provided quantitative feedback in the form of a questionnaire. The questionnaire provided data about the participants' perceptions of the advisors' co-creation skills. We used a comprehensive measuring instrument to assess the advisors' work-related skills. We applied the KODEX[2] measuring instrument (Heyse and Erpenbeck, 2007; Erpenbeck and von Rosenstiel, 2007), which can be used to assess, measure, and diagnose employees' work-related skills, which comprise professional, methodical, social/communicative, personal, and action-oriented skills. Since the KODEX measuring instrument[3] is very comprehensive, we will focus here on the data related to the solution objectives (SO1 to SO3; see Section 4). In detail, for SO1, the questionnaire contained items to assess the advisors' skills to implement the elements of the DART model: their dialog/communication skills, their media competence (knowledge and methodical skills to utilize and integrate available information sources), and the systematic-methodical skills to guide clients in their assessments of risks and benefits. For SO2, items were added to assess the advisors' IT-oriented knowledge and methodical skills. For SO3, items were added to assess methodical knowledge and personal skills when dealing with complicated or ill-defined situations. Finally, further items comprising the participants' perceived service quality (yield shift theory; (Briggs et al., 2012), for instance, "I am satisfied with the advisory session",

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

3 To apply the KODEX measuring instrument, the questionnaire-items for the superior competence areas need to be adapted to the respective job specifications and requirements. This was done in our study by, first, analysis of employment documents (job description, job ads, etc.) and the creation of an initial catalogue, and, finalization in an expert group consisting of two managers from the public administrations and one scholar with longstanding expertise on performance description in public administrations.

their perceived relatedness (included in the IMI measuring instrument (intrinsic motivation inventory); (Deci and Ryan, 2003)), for instance, "I felt close to the advisor", and their perceived involvement in the value creation process, for instance, "I felt involved in the creation of the result in the following advisory sessions". All items were rated on a 7-point Likert scale (7 = pos. max.).

6.3. Evaluation results

In presenting the evaluation's results, we support our observations with advisors' and clients' questionnaire and interview statements.

6.4. Advisors apply co-creative work practices (addressing SO1)

Observations: Our observations revealed that, compared to the conventional advisory sessions, the advisors extended their activities in the SET-supported sessions from "just creating a basic work relationship" to actively establishing a shared understanding of themselves and clients as co-creators. As first evidence, advisors-client talk time increased substantially in the SET-supported sessions (71% of the total session time they spoke in the SET-supported sessions, in contrast to 54% in the conventional sessions). Furthermore, in the SET-supported sessions, they provided elaborate explanations (regarding information they provided or activities they performed) and asked the clients more often to participate, compared to the conventional sessions (on average, an advisor made eight explanatory statements and invited the client four times to participate in the SET-supported sessions, while making only two explanatory statements and no invitations in the conventional sessions).

Questionnaire: Advisors perceived that clients could participate significantly more in the SET-supported sessions, benefiting more from the co-created results (s: 5.4, c: 4.4; sign. diff. 0.007). In this context, clients rated their involvement in the creation of the advisory's result in the SET-supported sessions significantly higher compared to the conventional sessions (SET-supported sessions (hereafter, s): 5.1, conventional sessions (hereafter, c): 4.2; statistically significant difference; see values in appendix A2). Furthermore, the clients also reflect on the advisors' changing behavior in their assessments. They valued the advisors' dialog and communication skills significantly higher in the SET-supported advisory sessions than in the conventional ones (s: 6.2, c: 5.7; sign. diff. 0.04). Finally, the clients also perceived that, in the SET-supported advisory sessions, the advisors were able to support them significantly better in assessing risks associated with the decision (s: 5.6, c: 5.2; sign. diff. 0.03).

Interviews: In their interview-statements, clients emphasized the added value of the SET-supported advisory sessions. One client said about the SET-supported session: "I liked being able to participate more, […] the advisors actively integrated me in all steps." Also, the advisors revealed that they took on their co-creator role better (addressing SO1). According to the advisors'

statement, they changed their opinions about involving the clients – from "I don't want the client to participate and to be too close to me" after the conventional sessions, to "I especially like the collaboration with the client" or "it is most important that the client is part of each activity" or even "it is fun to work with the clients this closely" after the SET-supported sessions. The advisors gave reasons emphasizing their ability to establish a more efficient collaboration. One advisor stated: "I liked the close collaboration with the clients […] they comprehend faster and we could work more efficiently."

6.5. Collaborative use of tools and information resources (addressing SO2)

Observations: In the SET-supported sessions, 11 of the 12 advisors actively used the available IT tool collaboratively with their clients. On the contrary, in the conventional sessions, 10 of the 12 advisors in the test did not show any collaborative tool usage behavior.

Questionnaire: The advisors' changed IT usage behavior was also reflected in the clients' assessments. They valued the advisors' knowledge and methodical skills to appropriately apply available IT and other media in the advisor-client interactions significantly higher after the SET-supported sessions (s: 6.1, c: 5.3; sign. diff. 0.002).

Interviews: The advisors gave reasons emphasizing the benefits of integrating clients in tool usage. One advisor noted: "It is much better to integrate him [the client] in the usage of the tool […] he becomes more active and participates much more." And regarding their non-collaborative tool usage in the conventional sessions, the advisors gave reasons, stating for instance that they "would not know how to integrate the client" or "it didn't occur to me to integrate the client […]".

6.6. Knowing when and how to initiate co-creation activities (addressing SO3)

Observations: The largest change in the advisors' behavior appeared in their active customization of the advisory process. While in the conventional sessions, advisors limited themselves to reactively answering clients' direct questions, they began to proactively ask questions in the SET-supported sessions. In doing so, they established more active dialog and directed the advisory process more purposefully.

Questionnaire: Our observations were also confirmed by the clients' feedback: They valued the advisors' methodical skills to adapt the advisory process to their preferences in the SET-supported sessions significantly higher (s: 5.6, c: 5.2; sign. diff. 0.04). Furthermore, the clients rated their involvement in the value creation process in the SET-supported sessions significantly higher than in the conventional ones (see results above; s: 5.1, c: 4.2) (addressing SO3). In this context, the clients perceived the results as significantly more comprehensible (s: 5.1, c: 4.57; sign. diff. 0.003).

Interviews: The advisors gave reasons for their behavior, referring to the predictability of the SETs. In fact, they appreciated "knowing what to expect when following the script [of an SET]" or "knowing how to handle the IT stool within the collaboration as described in the SET".

6.7. Promising approach to empower advisors to put value co-creation into practice

The clients were substantially more satisfied with the advisory service in the SET-supported session compared to the conventional one (s: 6.1, c: 5.5; sign. diff. 0.045). The advisors also rated their satisfaction much higher in their SET-supported session than in the conventional ones (s: 5.5, c: 4.4; sign. diff. 0.017). Furthermore, they felt more competent in providing a sound advisory service (s: 5.8, c: 4.9; sign. diff. 0.048) and in having a considerably higher impact on clients (s: 5.5, c: 4.4; sign. diff. 0.015).

7. Discussion and Conclusion

The evaluation showed that SETs turned out to be effective and useful means to effectively encourage front office employees to show distinct collaborative behavior in their advisory service encounters. While technical counseling affordances can provide opportunities for co-creation, when advisors lack the corresponding collaborative behavior, actual co-creation experiences are prevented. This illustrates an example we observed in a conventional advisory session: When the advisor searched for solutions on her desktop computer, the interested client bent forward to have a closer look on the screen. However, since the advisor did not explain her actions and did not ask him to collaborate, he leaned back again, i.e. he returned to the passive consumer role.

This paper focused on SETs and their functions as its core artifact. However, a comprehensive solution needs not only SETs, but also the technical foundation they build on (the counseling affordances). Thus, the evaluation compared the combination of SETs and counseling affordances to a setting with none of these present. This tight link between IT artifact and its corresponding work practices is typical in ADR (Sein et al., 2011). To create most value for research and practice, we focus on the combination of the two. The final evaluation showed that the combined support from SETs and counseling affordances can effectively empower advisors to implement the building blocks from the DART model (Prahalad and Ramaswamy, 2004a, 2004b) and establish a COSE) (addressing the research question). In this context, we conceptualize an advisory support artifact consisting of two components: a) technical counseling affordances and b) social interaction guidelines in the form of SETs as a *COSE artifact*.

7.1. The COSE-artifact: User-oriented Design for Improved IT-supported Advisory Service Encounters

The COSE-artifact can effectively help establishing co-creative advisory service encounters. We depict the architecture of the COSE-artifact in Figure 4. Therein, the interaction patterns, suitable for establishing co-creative interactions, are first formalized (cf. document symbol in Figure 4). They build the essential part of an SET as they are included in its components (cf. arrow from document symbol to the larger blue rectangle). In turn, the basic structure of an SET is instantiated in specific SETs (one or many) for each phase in the co-creative advisory service encounter (cf. arrows from blue to black rectangles in Figure 4). Simultaneously, building on the basic concept of a technical counseling affordance (cf. laptop symbol in Figure 4), specific counseling affordances are instantiated for each phase in advisory service encounter (cf. green rectangles). Ultimately, n SETs are combined with m counseling affordances in each process phase to support users effectively to establish co-creative advisory interactions. IS researchers can benefit from the COSE-artifact's construction description to complement documentation or improve deployment of their IT-based advisory support solutions.

Applying the COSE artifact, advisors are encouraged to take on their simultaneous role as co-creators in and facilitators of the advisory process. However, our evaluation revealed that, without an initial setup of co-creative work relationships between advisors and clients, the actors frequently remained in traditional role allocation of producer and consumer, preventing co-creation experiences. In line with Payne et al. (2008), we argue that the advisors need to actively manage the co-creation of value. In the service encounter, this needs to start with the initiation of a co-creative work environment in which the advisors should actively establish a close working relationship with clients and should ensure a shared understanding of the clients' and their own roles as co-creators with equal rights and duties. Simon's (1987) rational problem-solving process does not directly account for these relationship-building issues incorporated in value co-creation. Thus, initiating co-creation constitutes an important first activity in the co-creative advisory service encounter (see the different process phases in Figure 4).
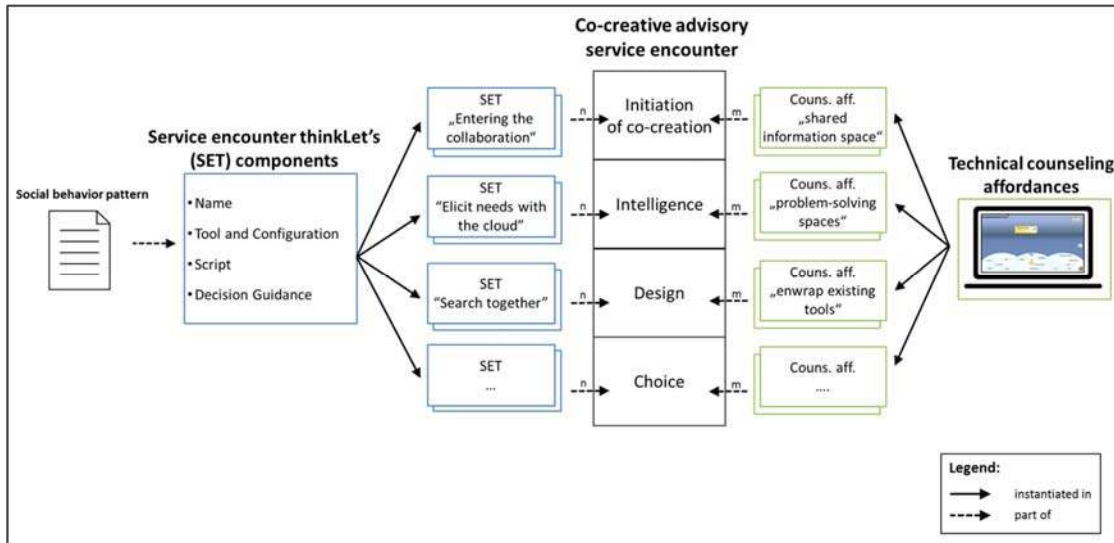
Figure 4. The architecture of the COSE-artifact.

Applying the COSE artifact constitutes an efficient instrument to enable advisors to put value co-creation into practice. With a training episode of less than one day, advisors could implement the abstract concept of value co-creation and could establish co-creation experiences for clients in their advisory service encounters. Hence, they accomplished the shift from product-centric service provision to creating personalized service experiences for the clients, as Prahalad and Ramaswamy (2004a) called for in their work.

The COSE artifact provides a scaffold that enables advisors to effectively apply co-creative work practices in their advisory service encounters. That is, the combination of SETs and technical counseling affordances (see Figure 4) provides advisors with the necessary tools, information, and behavioral instructions to establish individualized co-creation experiences. Our evaluation revealed the necessity of this scaffold: In the SET-supported sessions, all 12 advisors successfully established co-creation interactions. However, in conventional advisory sessions, only one of the 12 advisors was able to establish similar co-creation interactions. This 'loss' of collaborative behavior emphasizes the benefit (and necessity) of the combination of SETs and technical counseling affordances in supporting them: Without the constant 'offerings' from the counseling affordances, mere behavioral guidelines are not adequately present, and the advisors were far less capable of implementing co-creative work practices. The *COSE artifact as scaffold* shows what a large effect appropriately designed information system support in service encounters can have on value co-creation. Hence, we argue that current frameworks that describe processes and practices of designing for co-creative interactions in client-supplier encounters, as described by e.g. Payne et al. (2008) or Grönroos and Voima (2013), can be augmented by extending them with our design knowledge of corresponding support processes and practices.

7.2. Contribution to Research and Practice

By introducing the COSE artifact, we highlight how IS application can effectively be designed to improve customer service experience. The detailed description of the COSE artifact's architecture, its components' construction, and application in an advisory service encounter (cf. Figure 4), we contribute to ongoing IS research discourse on designing IS applications to improve customer service encounters. We can contribute to the planning models and frameworks for IS applications in services from for instance Peffers and Tuunanen (2005), Kuk and Janssen (2013), or Carter and Belanger (2005). We can complement their models with the perspective of the service-providing employees, highlight the role of front office employees in user adoption of service innovations, and show how they can be empowered to become de facto facilitators for the acceptance and adoption of novel service offerings.

Furthermore, the COSE artifact can be used as a framework that provides guidance for IS researchers such as Rodden et al. (2003), Nussbaumer et al. (2012), Kira et al. (2009), Novak (2009), or Schmidt-Rauch and Schwabe (2011, 2014), to comprehensively document and characterize their developed IS solution. With the detailed description of the COSE artifact's technical and social elements (depicted in Figure 4), especially the SET's components (*name*, *tool and configuration*, *script*, and *decision guidance*; Section 5), researchers have suitable means to complement their artifact design knowledge contribution to the knowledge base. That is, they can systematically communicate the social interaction patterns alongside describing technical design principles, making their deployed IS solution successful.

By designing, implementing and evaluating the COSE artifact, we could provide a proof of concept for applying collaboration engineering in customer service encounters. With introducing SETs (cf. Section 5) and describing its successful application in advisory service encounters (cf. left part of Figure 4), we were able to demonstrate how the concept of thinkLets can successfully be transferred from their traditional field of application of large groups to dyadic collaboration in customer service encounters. We thereby sought to contribute to the IS discourses on collaboration engineering of Briggs et al. (2001, 2003, 2009), De Vreede et al. (2006), and Kolfschoten et al. (2006) by refining the thinkLet concept for successful application in service encounters, in which facilitators are empowered to design their own collaborations more autonomously than originally planned. SETs provide advisors with the essential practices and guidelines, and help establishing co-creative activities. Our evaluations revealed that the decision-guidance component of SETs and the predictability of SET-initiated work practices turned out to encourage advisors effectively to initiate collaborative work practices in dyadic service encounters.

In applying concepts of collaboration engineering to service encounters, practitioners in service-providing organizations can systematically improve their customer service encounters, making

them true co-creation experiences. That is, they can use the detailed description of SETs with its building blocks (cf. section 5) and the individual counseling affordances (cf. section 4.1) as corresponding IS implementation guidelines.

Practitioners in service organizations can benefit from implementing the COSE artifact to improve on-the-job qualification methods. The qualification aspects in the COSE artifact address and diminish deficiencies of current methods to train and qualify service personnel. In contrast to the provision and application of scripts in the training of service staff members (e.g., Holman, 2002; Leigh, 1987), the developed SETs provide advisors with a portfolio of co-creative work practices rather than pre-structuring the advisory dialog and purporting a rigid process. The SETs comprise specific guiding information to enable advisors to decide for themselves when to apply an SET in the current problem-solving activity and, ultimately, altering the advisory session's process at any time (cf. the *decision guidance* element of an SET). Thus, we argue that the negative effects of standard communication scripts on the provision of personalized service could be prevented.

Furthermore, practitioners can benefit from the SET's and counseling affordances' integral support in their front office work environment. The instantiation of the COSE artifact, i.e. the *Citizenexplorer* prototype including the specific SETs, can greatly benefit all the stakeholders involved, namely the service personnel (= advisors), the clients, and the service provider. The advisors are comprehensively supported to apply co-creative work practices and to make appropriate use of the supportive IT artifacts. With the help of SETs, the advisors are encouraged to explicitly initiate a co-creative work environment, a crucial precondition to transform co-creation opportunities into co-creation experiences. With the SETs supplemented by the offerings of the counseling affordances (cf. Figure 4: n SETs combined with m counseling affordances being provided in each process phase), we could show how service personnel can successfully be supported in their dual role as domain expert and facilitator in advisory service encounters. Providing service personnel with the SET's decision guidance allows them to (re-) gain the autonomy and flexibility to customize the advisory service encounter and to establish personalized co-creation experiences. In turn, the clients in advisory sessions supported by SETs and counseling affordances perceived themselves more as co-creators of the advisory's result and substantially increased their satisfaction with and commitment to the advisory results. The service provider benefits because the COSE artifact – in the sense of a scaffold that contains tools, techniques, information, and behavioral instructions – enables service agents to take on their role as professional advisors. It may therefore constitute suitable means for quality management and support service providers to reduce the costs to qualify their service personnel and to establish a more consistent service quality. Furthermore, developers of future IT artifacts that support actors in their service encounters can use the detailed description of the COSE artifact's components (cf. Figure 4 and section 5) as a blueprint to enhance their systems' design and improve the systems' appropriation by service personnel.

The COSE artifact refers to the generic problem-solving process of Simon (1987) and is largely built on the broadly applicable concept of thinkLets from collaboration engineering. Thus, we argue that our findings can be transferred from citizen advisory services to similar service encounters in other service domains, for instance, financial advisory services or advisory services in travel agencies. In fact, first research efforts revealed similar problems in financial services and travel advisory services. To further strengthen the applicability of the COSE artifact, future research needs to systematically identify the deficiencies of advisors in other service domains. This also helps one to gain further insights into how the SETs help to resolve these deficiencies, thereby leading to a better service encounter.

While working in a real-world context with real front office employees allowed us deep insights, our research approach also comes with limitations. The evaluation with real front office employees could only be done in a short period test setting (over six days). Accordingly, we suggest that future research should gather deeper insights on the COSE artifact's effects on service personnel's appropriation and organizational integration by using longer period test settings, such as pilot studies.

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A. Appendix

A.1. Study Design and Data Collection

The study was conducted in the form of a user test with a within-subject test design. Six advisors gave advice to 12 clients in 24 advisory sessions. The advisors in the test came from the public administration of a major German city, where they work in the front office conducting face-to-face citizen advisory services. The five female and one male advisor were between 20 and 57 years old (average: 32.7). The participating clients were recruited from among the public administration's clients, and the six female and six male clients were between 18 and 74 years old (average: 39.5). To study the advisor in similar advisory sessions in terms of content, each client took on the role of a new inhabitant of the city, seeking corresponding advice to resolve their government-related issues in their novel social situation, related to their relocation (registering themselves, learning about tax regulations, public transportation, waste system, etc.). Therefore, we selected clients who had recently moved to the city (less than six months ago) to ensure a more homogeneous (missing) prior knowledge level on local government-specific administrative issues. To identify the advisors' fundamental deficiencies, each advisor conducted two conventional advisory sessions and two advisory sessions supported by the IT artifact. The advisors only received technical instructions on how to operate the supportive IT artifact, but no additional training on how to give advice. Every client experienced two advisory sessions, a conventional one and one supported by the IT artifact. We refer to the advisory sessions supported by the IT artifact as *artifact-supported advisory sessions*.

In accordance to the study's explorative nature, we primarily collected the data via qualitative methods, specifically observations of the advisory sessions and semi-structured/narrative interviews with participants, complemented with quantitative data collected via a questionnaire. We collected data about the advisors' current work practices by recording all advisory sessions

on video. To learn about advisors (non-)co-creative work practices, one researcher analyzed the recordings concerning how the building blocks for establishing co-creation experience from the DART model (Prahalad and Ramaswamy, 2004a) had manifested in the advisor-client advisory service encounters. In some detail, the analysis focused on how advisors i) establish active dialog with the clients (d*ialog*), ii) provide equal access to information (*access*), iii) provide transparent information (*transparency*), and iv) clients to assess risks and benefits of decisions (*risks and benefits*). Furthermore, to reveal the participants' underlying reasons for their behavior during the observed advisory sessions, we collected their direct feedback via semi-structured/narrative interviews. Owing to the study's explorative character, the catalogue of interview questions consisted of open questions, allowing the interviewer to formulate additional detailed questions adapted on the interviewee's answers. The interview questions focused on advisors' and clients' perceptions of the cooperation during the advisory session, for instance, "How did you perceive the collaboration with the advisor/client?" and their personal involvement in the value creation process, for instance, "How were you integrated in the advisory sessions' individual problem-solving activities?" Finally, we complemented the participants' qualitative feedback and qualitatively collected some of their impressions via a questionnaire, which they filled out after each session, rating the session they had just experienced. Its items comprised the participants' perceived involvement in the value creation process, for instance "I felt involved in the creation of the result in the advisory sessions", their perceived service quality (Yield Shift Theory; (Briggs et al., 2012), for instance, "I am satisfied with the advisory session", their perceived relatedness (included in the intrinsic motivation inventory (IMI) measuring instrument); (Deci and Ryan, 2003), for instance, "I felt close to the advisor". All items were rated on a 7-point Likert scale (7 = pos. max.).

A.2. Statistical Values of the Evaluations' Measurements

Measurement	Conventional session (1-7)	SET-supported session (1-7)	Statistic	p-value
Advisors apply co-creative work practices (addressing SO1)				
Clients' involvement in the creation of the advisory's result (involvement)	4.2	5.1	T(11)=2.411	p=0.035
Clients' participation in advisory session (involvement)	4.4	5.4	T(11)=3.317	p=0.007
Advisors' dialog and communication skills (DART's dialog)	5.7	6.2	T(35)=2.14	p=0.04
Advisors' ability to support risk assessment (DART's risk assessment)	5.2	5.6	T(35)=2.27	p=0.03
Collaborative use of tools and information resources (addressing SO2)				
Advisors' knowledge and methodical skills to apply IT and other media appropriately (KODEX)	5.3	6.1	T(35)=3.329	p=0.002
Knowing when and how to initiate co-creation activities (addressing SO3)				
Advisors' methodical skills to adapt the advisory process (DART's autonomy)	5.2	5.6	T(35)= 2.11	p=0.04
Perceived comprehensibility of advisory result (DART's transparency)	4.57	m5.1	T(11)=3.823	p=0.003
Promising approach to empower advisors to put value co-creation into practice				
Clients' satisfaction with advisory session (YST)	5.5	6.1	T(35)=2.08	p=0.045
Advisors' satisfaction with advisory session (YST)	4.4	5.5	T(11)=2.82	p=0.017
Advisors' perceived competence (IMI)	4.9	5.8	T(11)=2.224	p=0.048
Impact on clients	4.4	5.5	T(11)=2.862	p=0.015

Table A.1: Evaluation's results: Measurements regarding the advisors' ability to put value co-creation into practice with the help of SETs (as perceived by advisors and clients).

In our within-subject test design, where we compared users' perceptions of conventional and SET-supported advisory sessions, 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.