Waking Up a Sleeping Giant: Lessons from Two Extended Pilots to Transform Public Organizations by Internal Crowdsourcing

Christian Grotherr
University of Hamburg, christian.grotherr@uni-hamburg.de

Thomas Wagenknecht
FZI Research Center for Information Technology, wagenknecht@fzi.de

Martin Semmann
University of Hamburg, martin.semmann@uni-hamburg.de

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Christian Grotherr
University of Hamburg
Vogt-Kölln-Str. 30, 22527 Hamburg
Christian.Grotherr@uni-hamburg.de

Thomas Wagenknecht
FZI Research Center for Information Technology,
Friedrichstraße 60, 10117 Berlin
wagenknecht@fzi.de

Martin Semmann
University of Hamburg
Vogt-Kölln-Str. 30, 22527 Hamburg
Martin.Semmann@uni-hamburg.de

Abstract

Digital transformation is a main driver for change, evolution, and disruption in organizations. As digital transformation is not solely determined by technological advancements, public environments necessitate changes in organizational practice and culture alike. A mechanism that seeks to realize employee engagement to adopt innovative modes of problem-solving is internal crowdsourcing, which flips the mode of operation from top-down to bottom-up. This concept is thus disrupting public organizations, as it heavily builds on IT-enabled engagement platforms that overcome the barriers of functional expertise and routine processes. Within this paper, we reflect on two design science projects that were piloted for six months within public organizations. We derive insights on the sociotechnical effects of internal crowdsourcing on organizational culture, social control, individual resources, motivation, and empowerment. Furthermore, using social cognitive theory, we propose design propositions for internal crowdsourcing, that guide future research and practice-oriented approaches to enable innovation in public organizations.

Keywords: Public Transformation, Internal Crowdsourcing, Design Propositions

Introduction

The adoption of information technology is a key characteristic of digitalization, and enhances the process of creating service innovations (Barrett et al. 2015). Due to the rise of the sociotechnical phenomena, not only organizations but also society and individuals are impacted (Gallivan and Srite 2005; Janowski 2015). This leads to new forms of resource mobilization and integration, and the emergence of open phenomena, such as open innovation or crowdsourcing, which build on the engagement of individuals (Schlagwein et al. 2017). Consequently, due to the privatization of public services and the responsibility of public organizations to facilitate digitalization (Dunleavy et al. 2005; Fang 2002), public organizations are seeking to transform, and leverage, the benefits of the digital transformation (Holgersson et al. 2017).

However, the changes induced by digital transformation are disruptive. Initiatives to foster these developments need to deal explicitly with organizational, social, and leadership aspects, despite a narrow

technological focus (Bertot et al. 2016; Markus 2004; Matt et al. 2015). Reaching digital maturity will not only be achieved through technologies but depend heavily on the skills and engagement of employees. This emphasizes the need to investigate how to engage employees in their work environment, facilitating work motivation, and finally, leading to improved work practices (Rainey and Steinbauer 1999; Wright 2001). In this regard, IT-enabled engagement platforms are a powerful mechanism for empowering employees, and implementing digital transformation initiatives (Tilson et al. 2010). Specifically, the concept of internal crowdsourcing, a novel approach that seeks to mobilize unused resources, aims at leveraging benefits of employee engagement, by empowering them for open communication and engagement in decision-making and realization of change initiatives (Zuchowski et al. 2016).

To ensure lasting success, it is important to create a culture of openness, and social feedback (Zuchowski et al. 2016). This characterization differs from the characteristics of public organizations (Baarspul and Wilderom 2011). Public organizations are faced with fundamentally different goals and in structure, as they are focused on serving public interests (Rainey and Bozeman 2000). The support structure is therefore manifest as function-oriented with routine processes (Willem and Buelens 2007). Accordingly, the approach is disrupting the organizational culture, and requires long-term efforts accompanying with substantial changes in organizational governance and interventions to change individuals' behavior, through technological advancements. Despite the relevance of the topic, research on how IT-enabled engagement platforms, as sociotechnical artifacts, shape and change individual behavior within the organizational context is scarce (Doherty and King 2005; Goldkuhl 2013; Luna-Reyes et al. 2005; Orlikowski and Iacono 2001). Little is known about the long-term effects of open collaborative platforms in public organizations. Research is needed that goes beyond the design and prototyping of engagement platforms to usage and use scenarios in work environments of individuals and how they reshape cultural properties (Markus 2004). Although first initiatives implemented internal crowdsourcing in the private sector (Benbya and Leidner 2016; Feldmann et al. 2014), applying these approaches to the public sector remains challenging (Bozeman and Bretschneider 1986; Dawson et al. 2016). This leads us to the following research question: *What design propositions guide internal crowdsourcing with IT-enabled engagement platforms that aim for employee engagement and empowerment in public organizations?*

The aim of this paper is to shed light on how individuals engage in novel forms of open collaboration, which are facilitated by internal crowdsourcing and IT-enabled engagement platforms. We propose validated design propositions that guide the design and establishment of engagement platforms and internal crowdsourcing, thus facilitating employee engagement and in a long term shaping cultural properties. To observe such change, we build on two design science projects situated in the public sector and evaluate two internal crowdsourcing systems. We piloted the concepts with two engagement platforms extensively for six months, each in a real-world setting. Both engagement platforms aimed to empower employees to collaboratively propose, discuss, and develop improvements for identified strategic (Pilot 1) and tool-specific (Pilot 2) issues. The case organizations delegated decision-making power by approving the crowd not only to propose and discuss for change initiatives, but also to implement solutions. We reflect on the design decisions we made before and during the piloting phase. We applied a social cognitive theory perspective (Bandura 1989), to assess the impact of the pilots regarding their ability to open up organizational culture. This approach helps to explore the effects of engagement platforms on individuals behavior, which are guided by social norms (Bandura 1989). We identify design propositions for establishing supportive interventions, as well as design decisions about the platform, which facilitates the introduction of the platform to employees' daily work environment. On one hand, the design decisions made about the engagement platform affected individuals' behavior, such as reduced engagement barriers, with the visibility of engagement activities, thus affecting social norms. On the other, supportive and activating interventions, such as management engagement and realistic expectation management, were required that stimulate recurring engagement of individuals. These experiences led us to right-size our approach for sustaining digital transformation efforts within public organizations. The results support researchers and practitioners in starting the digital transformation of organizations, by making use of the internal crowdsourcing concept, and thus, aims at bridging the gap between information systems scholarship and practice (Nunamaker et al. 2015; Te'eni et al. 2017).

The paper is structured as follows. In section 2, we describe the theoretical foundations followed by the methodology; in section 4, we describe the artifacts and previous design results, the evaluation is presented in section 5. In section 6, we discuss these results, and propose validated design propositions. In section 7, we conclude our research.

Theoretical Foundations

Internal Crowdsourcing

Crowdsourcing has emerged as an approach that leverages the skills and creativity of engaging actors, and organizations have begun the process of adapting crowdsourcing to internal processes, such as ideation, design activities or decision-making, building on employees (Feldmann et al. 2013; Muller et al. 2013). This mechanism extends previous perspectives that employees are not be seen as passive idea generators but actively contribute to value co-creation by knowledge integration and realizing change initiatives (Semmann and Böhmann 2015; Zuchowski et al. 2016). Zuchowski et al. (2016) define internal crowdsourcing as "an IT-enabled group activity based on an open call for participation in an enterprise" (p. 168). By using internal crowdsourcing untapped individual resources, such as knowledge and skills, are mobilized, leading to knowledge sharing across hierarchical levels and business units and resources exchange for realizing collaboratively design challenges (Zhu et al. 2016; Boudreau and Lakhani 2013). By integrating distributed knowledge, the internal crowd is suitable for addressing complex problems, as these employees are better integrated into the operational business (Benbya and Leidner 2016). Therefore, technologies, such as engagement platforms, play a crucial role, as they provide "physical or virtual touchpoints designed to provide structural support for the exchange and integration of resources, and thereby co-creation of value, between actors in a service system" (Breidbach et al. 2014, p. 596).

However, because the internal crowd is a closed system within the organization and empower employees to actively contribute beyond their work routines, challenges arise concerning the corporate culture, employee motivation, hierarchical structure, and distribution of tasks, which are not addressed by external crowdsourcing literature (Majchrzak and Malhotra 2013). For example, task allocation differs between external and internal crowds, because external crowds work on individually assigned tasks, as the example of Amazon Mechanical Turk demonstrates, whereas internal crowds collaboratively solve complex problems (Hetmank 2014; Zuchowski et al. 2016). Moreover, external crowdsourcing refers to a large number of unknown participants (Estellés-Arolas and González-Ladrón-De-Guevara 2012), but internal crowds consist of employees who are in an employment relationship with contractual ties (Hetmank 2014; Simula and Vuori 2012). Hierarchies, day-to-day business, and a long-term relationship must be taken into account (Zuchowski et al. 2016), reflecting the cultural properties of the organization. Erickson et al. (2012) highlight that internal crowdsourcing hinges on a shift in traditional practices, as organizations often build on hierarchical structures and fixed processes, while internal crowdsourcing, in contrast, can be perceived as open and democratic, as it encourages idea generation and realization, while enforcing egalitarian (flat) hierarchies and flexible processes (Erickson et al. 2012; Riemer et al. 2015). Thus, the internal crowdsourcing system subverts the hierarchy through social cooperation, leading to increased transparency between management and employees, and to an improved cooperative culture.

Social Cognitive Theory

One theory commonly used in information systems for analyzing organizations, individuals, and the influences of sociotechnical artifacts on their behavior is social cognitive theory (Bandura 1989; Bichler et al. 2016). Cultural properties of an organization affect social control, which is a mediator of expectations for and perceptions of employee behavior (Leidner and Kayworth 2006; O'Reilly and Chatman 1996); see Figure 1. Social control and cultural properties affect employee engagement and empowerment, which in turn reshape cultural properties. Moreover, social control influences individual resources and motivation.

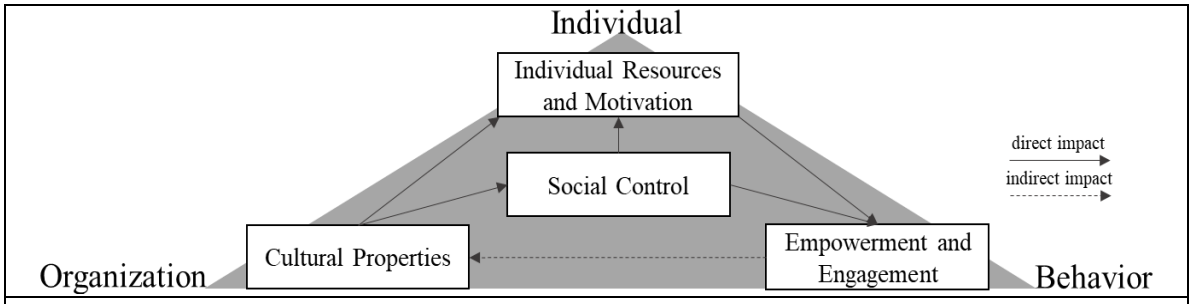


Figure 1. Research Model for Engaging Employees Based on Social Cognitive Theory

Cultural properties, stemming from an organizational culture with norms and values, define a set of shared assumptions (Deshpande and Webster 1989), which affect employees' behavior (Davison and Martinsons 2002). Organizational cultures vary considerably, and are difficult to capture in an explicit form (Jackson 2011). One useful way is to classify cultures in terms of learning and development approaches, knowledge sharing, and participative decision making, as well as collaboration, and tolerance for conflict and risk-taking (Hurley and Hult 1998). Cultural properties further determine the interaction between social groups and information systems (IS), and how they react to IS implementation processes (Jackson 2011). Employees are more likely to adopt new software if they perceive its value matches the cultural norms of a given organization (Nevo and Wade 2010; Silva and Hirschheim 2007). However, in the case of a misalignment, systems might remain unused, and employees could even resist implementing them (Markus 2004; Tyworth 2014). Just as organizational cultures shape the adoption of IS, technology can contribute to a cultural change, as individuals apply new work practices, which in turn leads to subsequent organizational transformation over time (Luna-Reyes et al. 2005; Nevo and Wade 2010).

Social control as a representation of cultural properties mediates expectations for and perceptions of individuals' behavior in organizational settings (Leidner and Kayworth 2006; O'Reilly and Chatman 1996). Social control manifests organizational culture in the action and behavior of individuals or groups of individuals. Therefore, collective values within organizations shape an individual's behavior and disposition to future interactions, and willingness to share information (Marwell et al. 1988; Wasko et al. 2004). In this regard, behavior can be positively rewarded by gaining reputation, sharing information, and establishing relations, thus enabling changes in social control (Constant et al. 1996; Storbacka et al. 2016). As reputation is a key resource and motivator for individuals, building on this facet contributes to overcoming social control, as witnessed in physical encounters (Jones et al. 1997).

Individual resources and motivation of employees such as knowledge and time are required for changing cultural properties (Lawrence et al. 2009). Individuals must be able to integrate their resources, as well as other individuals' resources, to engage in a collaborative process of value co-creation (Vargo and Lusch 2015). The provision and integration of resources depend on individuals' three types of motivations for engagement (Storbacka et al. 2016): (1) Relational properties determine the roles and position of individuals within an organization. (2) Informational properties define the knowledge and data that individuals contribute to and builds the basis for engagement. (3) Temporal properties refer to the duration, regularity, and frequency of the engagement. Building on individuals' motivation and their willingness to help others differs in voluntary engagement processes (Marwell et al. 1988). Motivation can be understood as a two-sided concept subsuming intrinsic and extrinsic motivation (Venkatesh 1999). Thus, motivation-increasing effects have been studied, and can be actively designed. For instance, researchers have shown that access to peers, possibilities to engage and learn, and receipt of information useful for work practice contribute to motivation to engage (Constant et al. 1996; Wasko and Faraj 2000).

Empowering and engaging employees involves giving them the authority to make decisions to get tasks done (Hammer and Champy 1993). This relates to information sharing, performance-based rewards, intensive training, and employee involvement in management decision making (Bowen and Lawler 1992; Wilkinson 1998). Empowerment initiatives intend to increase employee commitment and contributions (Wilkinson 1998). In turn, by applying new work practices, engagement of individuals shape cultural properties over time (Lawrence et al. 2009). However, Davisonand Martinsons (2002) question whether employee empowerment can automatically improve business performance in all types of organizations, as individual motivators vary among employees. Although some may be interested in receiving money, others thrive for status and promotion. Notwithstanding this possible limitation, one way to support employee empowerment may be to implement an internal crowdsourcing system.

Methodology

By applying rigorous IS research methodologies to cumulative research (Briggs et al. 2019), we develop IT artifacts to enable sociotechnical changes, thus contributing to theory by evaluating them (Hevner et al. 2004). Extant research has demonstrated that to realize organizational change, social and other non-technical elements must be taken into account (Gregor et al. 2006; Markus 2004; Silva and Hirschheim 2007; Ulbrich 2010). Thus, we do not limit our research approach to quantitative research, but emphasize qualitative methods (Besson and Rowe 2012). These methods are applied to leverage the experiences gained during a long-term piloting phase in the field (Briggs et al. 2019). Pilot projects are conducted to

"develop and implement technological innovations in their natural organizational and social environment" (Schwabe and Krcmar 2000, p. 3). Given this nature of piloting, we conducted two design science projects in two public organizations (see Table 1), with the aim of designing and evaluating sociotechnical artifacts throughout a six-month period. This approach emphasized that the sociotechnical artifacts were an integral part of the organizational context, and enhanced the sense of ownership of affected employees, and the promotion of collaboration among employees. Pilot 1 was conducted at a public-sector employment agency in rural Germany. The organization had around 120 employees located in three offices, serving a constituency of more than 200,000 citizens. The second pilot was conducted at a government port agency with 1800 employees, which is responsible for property management and port maintenance. In Pilot 2, the target group included a sample of 100 IT-knowledgeable employees.

Following the design science research methodology (Peffers et al. 2007), we started the research based on inhibitors in practice that hinder the realization of benefits resulting from a digital transformation *(problem formulation)*. Although both cases differ in the number of employees and aim, both organizations refer to similar cultural properties and social control mechanisms of public organizations. Both pilots started with the vision to give employees a strong voice, by empowering them, and to drive a shift from top-down to bottom-up logic (see Table 1). Pilot 1 aimed to engage employees on a broad level. They were free to introduce proposals for everything related to their work lives, including work routines, processes, and physical changes to the building. The organization already had a board meeting in place, which decides on strategic issues. They opened this physical-only meeting up to all employees, to the extent that they could propose suggestions and gain commitment that the board would then have to discuss how to implement during their strategic meeting. Using an internal crowdsourcing system, employees were able to propose, comment on, and like proposals for all subjects of interest to them. In contrast, Pilot 2 aimed at engaging employees with newly introduced software, to realize emergent benefits of the tool. In general, organizations struggle with a significant portion of unrealized benefits of software introductions (Semmann and Böhmann 2015). To address this challenge, a novel approach for engaging employees in the usage phase was established, to foster exploration and exploitation of the newly introduced software. It has been assumed that users can be an important driver for user-generated change initiatives, due to the users' context-specific knowledge and the need for short-term changes. Therefore, users are empowered to propose, discuss, rate, and, implement change initiatives.

Table 1. Summary of Characteristics of Two Pilots

	Pilot 1	**Pilot 2**
Type of organization	Public organization	
Aim of organization	Employment agency	Port agency
Number of employees	120 employees	1800 employees
Vision	Fostering empowerment, engagement, switching culture from top-down to bottom-up	
Specific aim	Strategic improvements	Tool-specific improvements
Applied mechanism	Internal crowdsourcing	
IT-enabled engagement platform	Yes (see Table 2 for Pilot 2)	
Research approach	Design science research	
Data collection and analysis	Workshops, interviews, observation, usage data (see Table 2), qualitative content analysis	
	Focus group (4)	Thinking alouds (33)
Range of affected units	Multiple business, digital and IT units	
Business units focus	Broad	Focused on business units strongly tied to IT (CIO, CDO)

As mentioned above, the organizational culture and the social control of public organizations must adapt to new modes of coordination, such as openness, transparency, and social feedback. These properties of empowered employees are at the core of internal crowdsourcing (Zuchowski et al. 2016), which was applied to both pilots *(objectives of the solution)*. Due to the specificities of the corporate culture, design decisions directly affect employee's motivation to engage, and must mindfully enable the shift to bottom-up appraisals. Building on these properties of both case organizations, it was necessary to develop

solutions with a sociotechnical mindset (Orlikowski and Iacono 2001). This enables us to compare design decisions made in the internal crowdsourcing system to the social cognitive theory components and how they were affected. Therefore, we instantiated the mechanisms of internal crowdsourcing conceptually in three core components (C1: Initiate Change; C2: Gain Crowd Commitment; and C3: Realize Change), with corresponding design features on the engagement platform *(design and development)* (Semmann and Grotherr 2017). The proposed internal crowdsourcing systems encouraged employees to share their knowledge across functional and hierarchical boundaries. Accordingly, following a literature review, we designed the artifacts based on the requirements gathered from future users, at junior and senior levels, and implemented IT-enabled engagement platforms in both organizations (see Table 1). By making use of multiple mock-ups and clickable prototypes, we *demonstrated* the relevance of IT-enabled organizational transformation, and designed two IT artifacts as a solution, in several workshops and interviews (Rubin and Rubin 2011). Following previous research on IS implementation in public organizations (Ulbrich 2010), we used a multi-method approach for the *evaluation*. The evaluation included (1) collecting and analyzing data from user-generated content (i.e., proposals, comments, and likes; see Table 2) and (2) interviewing key personnel of the organizations in both pilots. In Pilot 1, we also conducted four focus groups (Krueger and Casey 2014) with team managers, as well as four non-management employees. In Pilot 2, we ran 33 thinking alouds (Boren and Ramey 2000), which lasted 45 minutes, with system users. We recorded, transcribed, coded, and analyzed all interviews using qualitative content analysis (Schreier 2012). Based on this analysis, we aimed to derive insights into the sociotechnical implications of internal crowdsourcing in public organizations (Orlikowski and Iacono 2001): Specifically, we applied the social cognitive theory perspective (see Figure 1). Finally, we reflect on the pilots to derive design propositions, and contribute to the research on digital transformation in public organizations.

Core Components of Engagement Platforms

In the following, we describe the two artifacts, which were previously designed and developed (Semmann and Grotherr 2017; Wagenknecht et al. 2017). The internal crowdsourcing mechanisms were translated into the artifact and conceptually implemented in three core components on the engagement platform.

Component 1: Initiate Change: The aim of this component was to empower employees by providing the ability to contribute ideas for change initiatives. The component had to address an individual's resources and their mobilization. We supported proposing new ideas by enabling tags, the integration of images, and standardized templates, which is in line with common design choices of internal crowdsourcing systems (Zuchowski et al. 2016). To defuse social control and to embolden reticent employees (Haines et al. 2014), within Pilot 1 employees were able to selectively propose initiatives anonymously using a feature called "opt-in anonymity." In Pilot 2, employees did not have this opportunity. By providing the opportunity to participate anonymously, employees might be willing to engage in crowdsourcing activities, and express their opinions, as they feel free from social norms and cultural properties such as hierarchy. Note that the "opt-in anonymity" feature was designed to reduce the likelihood of a crowd member acting maliciously, as this feature encourages employees to switch to anonymous contribution only for sensitive subjects. However, if the users are not anonymous, the contributions can be allocated, and thus, achieve higher-quality results. In addition, this enables a network of experts to be established for specific topics. These different design choices helped us investigate the effect of anonymity on employee engagement.

Component 2: Gain Crowd Commitment: The overall purpose of this component was to leverage employees individual resources to engage in a collaborative process of advancing proposed change initiatives and to gain supporters. This includes mechanisms for providing feedback and rating change initiatives, as well as developing suggestions for solutions (Pilot 2). These mechanisms go beyond traditional suggestions boards, as employees are empowered to actively contribute to solution realization. In both cases, employees could engage on the platform, and provide feedback via comment and like functions. Regarding social control, this allowed colleagues to show appreciation and recognition. Moreover, both platforms provided opportunities to discover relevant change initiatives using search and filter functions. A simplified search for relevant initiatives was promoted via a tagging mechanism (Pilot 2). In Pilot 2, employees were also able to rate and share change initiatives, which have a positive effect on social control as it motivates other individuals to engage. Based on the employees' preferences, the platform also recommended interesting initiatives via notifications and newsletters to increase an

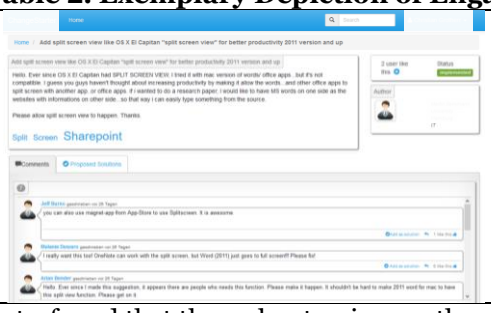
individual's motivation to engage. In addition, defining mechanisms for governing the crowd is crucial (Zuchowski et al. 2016). In both pilots, we provided community guidelines to motivate employees to engage and stimulate positive discussions. In Pilot 1, designated employees on each organizational team acted as multipliers who received special training on how to best use the system. In Pilot 2, community management was employed to govern social control by motivating employees to engage and to resolve conflicts by guiding the crowd for fairness. In terms of incentives for crowd commitment, we did not implement monetary rewards. Monetary incentives are not common in public organizations, and thus, might conflict with daily work routines and employment contracts.

Component 3: Realize Change: The aim of this component was to empower employees to realize change initiatives. By doing so, employees are not merely seen as passive idea generators, but increase autonomy in decision-making and realizing collaboratively proposed changes initiatives. Especially in Pilot 2, the goal was not solely the discussion of change initiatives, but to actively solve identified issues. The organization transferred the decision-making and realization power primarily to the crowd, as they were responsible for selecting tasks, developing solutions for change initiatives that guide their colleagues step-by-step, explaining to them how they can use the newly introduced software in the right way, or implementing lightweight change initiatives. There are two possibilities for engaging individuals: implicitly via newsletters from the platform (Pilot 2), or explicitly via e-mails addressed to potential employees (Pilot 1). The benefits of empowered employees can be demonstrated by providing success stories of beneficial change initiatives. This was done in Pilot 2, leading to a contextualized demonstration of the value of engaging on the platforms on an individual level. If the solutions involved technical changes (Pilot 2), the initiative had to be supported by IT operations. Pilot 1 returned the primary responsibility for implementing organizational change initiatives with the incorporation of employees to senior management. A risk of frustration could arise if the implementation process of change initiatives takes a long time. To address these motivational issues, there were several functions affecting individual motivation to engage. First, implicit communication features, such as newsletters, or explicit ones, such as direct suggestions sent by users or community management via e-mail to tagged experts, facilitate constant information and engagement flow. Second, in Pilot 1, employees had limited time to choose which change initiative should be posted on the management board. Each user only had one vote per two-week period. Thereafter, the board decided on whether, and how, the proposal could be implemented. This time constraint facilitated timely feedback and implementation activities, leading to success stories. In contrast, Pilot 2 implemented a continuous phase model without restrictions on time frames.

Evaluation

Following Venable et al. (2016) approach, we gathered data during piloting (see Table 2). In this section, we give an overview of the usage and evaluation results. In the following discussion section, we reflect the effects of the design of the sociotechnical artifacts, according to social cognitive theory and related behavioral, individual, and organizational perspectives, and deduce design propositions.

Table 2. Exemplary Depiction of Engagement Platform and Data Gathered in Both Pilots



	Pilot 1	Pilot 2
User profiles	81	40
Proposed initiatives	13	27
Likes	77	144
Comments	20	82
Realized initiatives	n/s	5
Example	Company bike	URL Shortener

Pilot 1 found that throughout a six-month period, there were 13 idea proposals, 20 comments, and 77 likes contributed by 81 registered users. However, participants reported that motivation to engage in the system decreased over time. According to them, this was due to the decreasing number of new change initiatives, as well as the slow realization of the proposals that had received the highest number of user votes. In an interview, the managing director of the public organization said that the latter was simply due to the varying complexity of the ideas. For instance, although the managing director welcomed the idea of a "company bike" requesting funding, releasing a tender offer, and acquiring the bikes were lengthy tasks.

Nevertheless, they confirmed that both "*Employees who were anyway already participating, as well as more cautious ones, dared to act on the platform.*" (Pilot 1). In Pilot 2, 40 users contributed 27 change initiatives, 82 comments, and 144 likes over a six-month period. This led to 20 solution proposals, and finally, to 5 realized change initiatives. These change initiatives varied regarding their scope (Grotherr et al. 2018). On one hand, users created lightweight how-to's and guidelines, emphasizing shortcomings with current software training. On the other, some solution proposals required technical support from the IT department. This is predominantly highlighted by the example of "URL Shortener for SharePoint". This user-generated change initiative found approval among crowd members, resulting in likes and the discussion of solution scenarios. In addition, some users searched for open source solutions, and came up with proposals. This work is particularly useful from an IT department perspective as highlighted by the head of IT operations: *"Solutions based on open source projects help us to ensure timely implementation without the need for finding internal partners that could fund the initiative."* In this regard, with quality assurance for training and portfolio management in mind, the head of the IT department engaged continuously on the platform. However, concerns might be expressed regarding quality assurance and the potentially low quality of employee-contributed results. Especially in the case of missing knowledge regarding technical expertise, community management had to engage and attract potential experts.

Despite the data gathered on the platform, concerns were expressed during the piloting about social control and the culture of sharing. On an individual level, barriers to engage were identified, because some users were uncertain about the role of the platform, including appropriate behavior on the platform as part of the social control. Participants are concerned about how to formulate salutations (*"Should I write 'Dear ladies and gentlemen'?"*, Pilot 2). In addition, some participants ask for the opportunity to comment anonymously, as *"we don't have a culture of failure – nobody wants to fail in public"* (Pilot 1). Such barriers were addressed in Pilot 2 by prepopulating guiding first user-generated change initiatives. For both pilots, we found that public organizations follow a hierarchical organizational structure. The internal crowdsourcing system with its open structures and flexible processes seems to contrast with the organizational structure and culture. Based on the interviews in Pilot 1, we found that the organization had specialized teams in which members collaborated closely with each other within their teams. The absence of a culture of knowledge sharing was also reflected by the statement made in Pilot 2, that *"within a hierarchical organizational structure, the resource knowledge reflects authority and strength*, *which nobody wants to lose"*. Moreover, as there were prescribed and pre-defined procedures from a federal institution, the degree of freedom in how to conduct most tasks was very limited, and individual resources and motivation seemed to be closely tied to daily work routines. In both pilots, employees stressed that these tasks needed to have the highest priority. This prioritization is encouraged by the choice of a single winner (Pilot 1). This has the effect that the employees worry about whether their idea has a chance and in case of uncertainty tend not to participate because *"it is not worth the effort"*.

In addition, employees engaged on a voluntary basis; thus, the platform did not necessitate dedicated resources. Employees were concerned *"that the activities are transparent on the platform and that the supervisor might think that you are not working at full capacity and then get even more work"*, which reflects conflicting interests of work routines and the willingness to engage. Although we proposed to top management in Pilot 1 and Pilot 2 that they should reserve some time for users to contribute to the crowdsourcing engagement, the organization's leadership neglected to do so formally. General public organization values which seek to act efficiently and fulfill the obligations of government functions hinder explorative and experimental approaches (van der Wal and Huberts 2008), which was also reflected by an interviewee: *"Even though we are also confronted with the digital transformation, we still have one central and fundamental distinction compared to private businesses: the target group. While private businesses are doing well with the approach of reaching 80% of the target group, we are bound to provide our services to 100% of the target group—belonging to the whole without exclusion."* In effect, employees had to be motivated intrinsically, somehow freeing up time in addition to their regular tasks.

Discussion

As the results of the evaluation revealed, an area of tension exists regarding the concept of internal crowdsourcing as a possibility to catalyze digital transformation in public organizations. Building on these insights, we derived design propositions (see Table 3), to contribute to the research call for "delineating design principles for value co-creation-enabling IS instances" (Haki et al. 2018, p. 13).

Design Propositions for Facilitating Employee Engagement

Table 3. Design Propositions (DP) for Internal Crowdsourcing in Public Organizations	
1	Determine the degree of top-management engagement (committed, supportive, active), as well as the time needed to participate in the engagement process to exemplify the relevance, value, and behavior as a role model for employees.
2	Middle management support is crucial, to communicate the value of the internal crowdsourcing initiative in daily work routines, and to mobilize employees' resources to engage on a voluntary basis, given top-management commitment and engagement as a starting point.
3	The platform must be designed to be lightweight, and integrated into the employees' work context, to reduce social and technical entry barriers, such as access, adoption of a new platform, and modes of collaboration.
4	Setting up realistic expectations and defining simple tasks for an internal crowdsourcing platform is crucial, to avoid overwhelming employees and the organization with novel, explorative approaches, given the limitation that resources are scarce in public organizations.
5	Building heterogenic crowds by defining and maintaining adjacent business units and functions lead to visibility of the overall project, facilitates company-wide acceptance, and leads to action, demonstrates the relevance and value of the platform, and reduces resistance in relation to new ways of working.
6 & 7	Providing real names on the platform increases group dynamics based on employee recognition, and the possibility of exploring other peers, assuming that in public organizations, employees behave professionally. Enabling anonymous employee contributions is valuable regarding sensitive and organizational critical subjects, to reduce uncertainties and entry barriers in front of superiors and other employees.
8	Providing initial content that employees use as a point of reference, to provide contextualized examples for using the platform, thus reducing uncertainties and entry barriers.

Zhu et al. (2016) emphasize the risk of "not-invented-here" syndrome as a cultural property, and the potential lack of internal drivers that advertise internal crowdsourcing. In this regard, gaining top management commitment is crucial (Erickson et al. 2012; Kotter 2007), as they determine the time and budget for the internal crowdsourcing systems. Although top management engages in initiating a crowdsourcing system, it does not mean that they will also act as role models. The observations reveal the "readiness" of the public organizations for such sociotechnical change, as it demonstrates that empowering employees as a bottom-up initiative is in contracts to the organizational culture and structure of public organizations. Managers assume a duality role of top-down promoters for innovative new work practices, but also have to secure effective daily work-routines. That is, despite top managers, as well as the workers' councils, were very committed upfront in Pilot 1 and Pilot 2, they did not contribute to the platform. The evaluation results indicated ambivalence in terms of top-management's commitment and engagement. On one hand, engagement on the platform could represent a role model that employees might follow. For instance, the mere participation by top managers may encourage, and authorize employees to participate. Moreover, top management should value crowd members for their engagement as a motivational mechanism, and show that time spent on the platform is beneficial (Kotter 2007). On the other hand, when management engagement becomes a burden, the effect might be reversed. In Pilot 1 we observed that some employees were deterred by the managing director's invitation to personally explain a successful proposal to him. This is particularly curious as employees in the private sector, which tends to be more competitive (Jackson 2011), might actually be encouraged by such an invitation, whereas employees of public organizations are discouraged. Thus, it is even more important to *determine the degree of top-management engagement (committed, supportive, active), as well as the time needed for participating in the engagement process* (DP 1). Moreover, as internal crowdsourcing should encourage employees from different business units to collaborate, business unit management might be restricted to steer their department locally. Especially, within functional organizations, business unit management tends to design work routines to be stable and efficient (Holgersson et al. 2017). *"Business unit management has got a key performance indicator to perform efficiently within their unit, but they have no KPI for working cross-functional"* (Pilot 2). In contrast, empowering employees is characterized by collaboration across departments. Accordingly, the mobilization of resources outside employees' daily work routines is important, and therefore, *middle management support is crucial* (DP 2), which have to be in line with top-management understanding of employee engagement (Giritli Nygren et al. 2014).

On an individual level, conflicts with daily business activities arise. On one hand, creativity has to be encouraged, and on the other, processes provide the predominant working structures. Everything that is required of employees has to be considered as work hours. It is necessary to find regulations with the business unit management and work council for larger time investments. This correlates with lack of acceptance at the management level, as there is no dedicated time or appreciation as mentioned before. The organization has to consider how crowdsourcing and day-to-day business can coexist. However, in public organizations, resource conflicts exist, due to defined processes and the agencies' stable and efficient work structures (Holgersson et al. 2015). There is no organization-wide commitment providing dedicated resources, and providing dedicated resources at the starting point of such an explorative transformation is not feasible. Therefore, *the platform should be designed to be lightweight and integrated into employees' work context* (DP 3). First, tasks should not be determined too time-consuming by platform objectives. Second, reducing entry barriers through technical arrangements, such as a single-sign-on mechanism, limits media disruptions and the platform does not trigger resistance. This is required to go beyond the mere experimentation phase towards continuous use scenarios in real-world environments of employees, which is facilitated with piloting (Briggs et al. 2019).

Regarding task crowd alignment, it is difficult to judge in advance the scope of change initiatives, due to unknown organizational barriers. However, the realization of change initiatives through an internal crowd represents a greater challenge than proposing change initiatives (Miron-Spektor et al. 2011). Due to different levels of knowledge in the crowd, there is a risk that employee engagement will lead to the emergence of the role of experts regarding specific topics. In both pilots, employees were concerned about *"becoming a dedicated expert" (*Pilot 2) and *"being responsible for realizing change initiatives"* (Pilot 1). After some proposed initiatives were selected in Pilot 1, the contributors were invited by their managers to provide feedback. However, the contributors were concerned about implementing the proposed change initiatives. Especially, in the case of solving change initiatives, it was stated that users neither possessed the knowledge nor wanted to engage in this phase due to capacity constraints of daily business routines (Pilot 2). This is counteracted by *setting up realistic expectations and defining simple tasks for the internal crowdsourcing platform* (DP 4) that avoid the formation of such roles. To avoid overwhelming the organization and employees, the purpose of the platform has to be aligned regarding the knowledge base of the engaged employees. Accordingly, the aim is to define manageable tasks that everybody can solve, but allow complex initiatives, providing the opportunity for profiling of engaged employees.

Another goal when introducing internal crowdsourcing is to define the crowd members (Zuchowski et al. 2016). Pilot 2 built on a crowd comprising users of newly introduced software. Pilot 1 included all employees, senior managers, and lower-level employees. Although Pilot 2 restricted employee engagement to the user level, in both pilots, several users with various backgrounds engaged on the platform, leading to fruitful discussions and realized change initiatives (see Table 2). Accordingly, *building heterogenic crowds through defining and maintaining adjacent business units and functions leads to high visibility of the overall project, facilitates company-wide acceptance, and leads to action taking* (DP 5). Within public organizations, long-term employment relationships are common as a cultural property. In this regard, similar initiatives (i.e., company suggestion programs) may have been implemented, and employees might have been affected in the past. Even if this function pursues a different focus, there are intersections and the platform should not be set-up on a green-field. If these initiatives were successful, a competitor could be seen on the new platform. If they were unsuccessful, there is a risk of *"scorched earth"* (Pilot 2). A possibility for increasing synergies is to define processes with adjacent business functions. The goal is to stimulate connectivity, which can be achieved through engaging business units for quality assurance and incorporating the proposals into work routines. Pilot 2 demonstrated the link to knowledge management, which maintains knowledge for the entire organization.

Finally, defining collaboration structures is a prerequisite for continuous engagement, but neglects the effects of social control caused by open communication and the transparency of the activities of engaging employees. Especially in organizations with power distance, this leads to engagement barriers (Wasko et al. 2004). We handled the subject of identifiability as opposed to anonymity differently in both pilots. Pilot 1 included a feature that enabled "opt-in anonymity". Pilot 2 asked users to provide their real names. During the evaluation of Pilot 2, participants noted that colleagues might be afraid of expressing themselves through comments due to a fear of *"loss of face"* with respect to managers and colleagues. Surprisingly, many participants themselves were not concerned about using their real names. In Pilot 1, employees were also concerned about discussing sensitive issues that might contradict their superiors'

opinions. As we learned during the interviews, the opt-in anonymity feature led even otherwise reticent employees to participate. Nevertheless, it is difficult to assess whether the opt-in anonymity feature led to more ideas. Moreover, employees recognized the presence of *"many helpful and technically experienced colleagues"* (Pilot 2), and by providing real names, interest groups emerged based on their records and met outside the platform. In addition, certain employees tried to represent themselves through meaningful contributions, and influence each other based on their roles. To summarize, *providing real names on the platform showed a strong indication of increased group dynamics based on employee recognition, influence, and possibility to explore other peers* (DP 6). However, *enabling anonymous user contributions for sensitive subjects* (DP 7) might embolden reticent employees (Haines et al. 2014).

Social control, through long-standing relationships and a common group history (Valacich et al. 1992), acts as a positive norm enforcer. As public employers achieve high retention rates over longer periods of time, employees know each other well in a professional context. Thus, we did not observe any disinhibited language in either pilot. To the contrary, *"speaking the right language"* was perceived as a minor challenge (Pilot 2). This proves professionalism in the public organization but may prevent open and light conversations. Thus, by *providing initial content that participants use as a point of reference (DP 8)*, Pilot 2 addressed this challenge. Providing initial content demonstrated how to use the platform and reduced engagement barriers, *"since no one wants to be the first to place on anything"* (Pilot 2). This ensures an improved understanding on the employee level, as the initial content facilitates the translation step from the abstract vision of employee engagement to concrete and easy-to-understand cases. In addition, the benefits of the platform, and the fact that employees' contributions are taken seriously, can be highlighted by success stories, thus facilitating task importance and work motivation (Wright 2001).

Theoretical and Managerial Implications

As employees are central to drive transformation within organizations, research calls for an in-depth understanding of how individuals respond to new practices and how they overcome organizational barriers (Lenka et al. 2018). Providing internal crowdsourcing through a piloting mechanism stimulates a rethinking of current work practices, and enables new forms of cooperation in the work environment (Zuchowski et al. 2016). Although private organizations have gained first experience with internal crowdsourcing, the need for innovation in the public sector is driving organizations to adopt new sociotechnical artifacts. Prevailing cultural properties of public organization which are manifested for example by defensive decision making across all hierarchical levels have to be overcome by mechanisms, which encourage employees voice and establishing a social control of openness (Artinger et al. 2019). As both pilots showed, internal crowdsourcing offers an opportunity for public organizations to open their organizational culture up to increased knowledge sharing and a higher tolerance for critique and failure. The two long-term pilots in public organizations provided evidence that internal crowdsourcing has the potential to reshape the nature of interaction to generate new social connections and cognitive models, that unleash collaborative engagement in a broader social and institutional context. Moreover, crowdsourcing encourages an entrepreneurial spirit and drive innovation and represents a feasible mechanism to turn the abstract process of digital transformation into tangible and measurable reality of designable artifacts as previous research has called for (Gawer and Phillips 2013). From a practical perspective, we shed light on the concept of new work (Ashford et al. 2007) by proposing internal crowdsourcing and validated design propositions as a promising approach to overcome organizational barriers. Consequently, individual behavior, and interactions within the organization affect the organizational culture and transformation, which refers to institutional work that is originated in organizational studies (Lawrence et al. 2013).

However, both pilots showed that crowdsourcing in public organizations is anything but a sure-fire success. Both pilots suffered from motivation barriers. Some of the reservation was arguably related to the fact that the organizational cultures contrast with the values encouraged by internal crowdsourcing systems. However, entrepreneurship is only rarely invigorated in the public sector. On a group level, public employees are rarely encouraged to act informally and in a non-conformist manner. However, these competencies would arguably be required for a successful crowdsourcing engagement (Riemer et al. 2015). The reasons can be attributed to the organizational culture, as public agencies, compared to private organizations, face unique accountability, as one interviewee stated: "*Public organizations are watched by various groups and stakeholders, […], this makes it even harder to establish a culture of experimentation.".* Thus, it is difficult for public organizations to adopt measures to increase employee

engagement, which would be easy to implement in private organizations (Benbya and Leidner 2016). For instance, offering monetary rewards, or allocating work hours, is considerably more difficult to achieve in the public sector, where collective wage agreements and oversight by federal supervisory institutions are widespread. To circumvent the suboptimal incentive situation, top management could provide a vision (Hendry 1999), while middle managers help to prepopulate the discussions and engage on the platforms to act as role models (DP 1 & DP 2). However, even when employees approved a change initiative, top management struggled with the bureaucracy, as public organizations are owned by the government, and funded by taxes. In effect, realizing these initiatives took a considerable amount of time, and thus, discouraged further employee input, as the employees did not see their ideas acted on quickly enough.

The characteristics of public organizations revealed the need to pursue processes that realize the potential of digital opportunities to exploit public services (Dunleavy et al. 2005). This requires not only technological advances but also a rethinking of collaboration practices and organizational culture. These developments are closely linked to the reorganization of organizational boundaries and research has shown the need to investigate more in-depth into sociotechnical and organizational changes (Luna-Reyes et al. 2005). By applying social cognitive theory, we highlighted these interdependences of organizational, group, and individual dimensions referring to organizational culture, social control, and individual motivation, which affect, and are directly related to, design decisions. This is reflected by the variety of design propositions, which demonstrated, from a sociotechnical perspective, the need to investigate technological design (DP 3, DP 6, and DP 7), as well as an engagement-stimulating mechanism, ranging from supportive (DP 8) to comprehensive interventions (DP 1, 2, 4, 5), which in turn affect social and individual behavior. In general, the paradox of innovation presented by Miron-Spektor et al. (2011) demonstrates that more structure is needed for open collaboration. The challenge is to find a balance among regulations, structures, processes (top-down approaches), and self-determination of empowered employees (the bottom-up approach); thereby considering existing work environments of employees. Therefore, future initiatives have to combine public administration objectives and explorative approaches to create new service innovations. We agree with previous researchers who proposed a service and institutional logic perspective as a fruitful approach for managing activities that create new innovation opportunities, and drive organizational transformation (Barrett et al. 2015; Chesbrough 2010; Kurtmollaiev et al. 2018; Lusch and Nambisan 2015). We propose that a multilevel consideration of information technology and corresponding design decisions on a social and organizational level, is a worthwhile approach. This perspective helps to understand, and reflect the effects of information technology to individuals, on the micro-level to the social group, on the meso-level; and to the organization, on the macro-level (Bélanger et al. 2014; Burton-Jones and Gallivan 2007; Zhang and Gable 2017). This approach broadens the perspective of sociotechnical artifacts towards designable elements on different levels, which transfers the activities for institutional work to interaction design between individuals and the design of organizational structure (Barrett et al. 2015; Grotherr et al. 2018; Silva and Hirschheim 2007). Although the platforms have not yielded ground-breaking changes, they contributed to the aim of collaboration and openness. Even if a culture of failures, as known from Lean start-ups (Ries 2011), contrasts with stable and efficient work routines in public administration, long-lasting digital transformation requires experimental approaches. Accordingly, Zuchowski et al. (2016) describe internal crowdsourcing as a form of organizational learning, and as our design propositions indicated, value co-creation in public services is a collaborative process in which individuals engage, which requires mechanisms that facilitate engagement on the macro-, meso-, and micro-level (Storbacka et al. 2016). Thus, internal crowdsourcing can be used to solve the problems of knowledge-intensive services, facilitating adaptive learning from a short-term perspective. In the mid-term, business units should be integrated to improve environment-oriented learning. In the long term, internal crowdsourcing should be integrated an overarching structure as part of the work methods, to facilitate culture transformation.

Conclusion and Outlook

Driven by the ongoing digitization, organizations are investing heavily in digital transformation projects, which are driven by a combination of strategic visions, and facilitated through digital platforms. However, organizations are faced with the related transformation of structures, processes, and services, as such changes cannot be sustained exclusively from a technological perspective. In this study, we addressed internal crowdsourcing as a mechanism that can help transform public organizations. The aim was to strengthen ties between employees, and to establish internal crowdsourcing as a beneficial mode of

collaboration. Shared experiences, shared successes, and growing familiarity of employees were facilitated. These aspects resulted in beneficial interactions of employees as the platform represented a locus for exchanging knowledge, thus facilitating digital skills, such as openness, networking, and collaboration. Building on this novel mindset, public organizations can benefit by broadening the predominant organizational culture, and in the long run, transform their corporate culture toward openness, decreased hierarchies, and a culture of exchange. However, little is known about how to implement and establish internal crowdsourcing, and how supportive sociotechnical artifacts evolve over time. Principles, guidance, and interventions are required for establishing employee-engagement mechanisms. Moreover, introducing engagement platforms as sociotechnical artifacts into employees' environments requires several design decisions concerning the platform as well as organizational design.

Reflecting on the need to engage employees to drive organizational transformation and engagement platforms as intermediaries, in this study, we aimed to provide insights into how the design of IT-enabled engagement platforms as sociotechnical artifacts shape individual actions, subsumed in social norms, and holistically, in the organizational culture. The social cognitive theory highlights the interdependence of cultural properties, which shape social control and individual motivation, and in this context, the behavior to engage. This helps scholars and practitioners understand the effects of internal crowdsourcing mechanisms, engagement platforms and corresponding design decisions from multiple perspectives, and how this reshapes the organizational culture in the long run. Moreover, the effects of establishing internal crowdsourcing, which aims to stimulate engagement and empowerment, and IT-enabled engagement platforms, which influence social control and individual motivation to engage, can be analyzed regarding design decisions. This enables scholars and practitioners to systematically explore and exploit a design mechanism that fosters organizational transformation toward collaborative and open working practices.

The pilot projects were built on two engagement platforms that were used in a natural environment for engaging employees for six months to change the mode of interaction in two public organizations. By utilizing design science research methodology and social cognitive theory for reflecting both pilots, we derived design propositions, and contribute to the debate on engaging employees to increase innovativeness, and stimulating digital transformation, in public organizations by using sociotechnical artifacts. As both pilots achieved progress, establishing internal crowdsourcing has the potential to drive cultural and institutional change within public organizations, as the introduction of engagement-facilitating IT platforms as sociotechnical artifacts imply a shift in the collaboration practices of individuals, which are shaped by the design of the platform and introduction into their daily environment. Internal crowdsourcing shifts a strict process- and hierarchy-driven environment, by empowering open and visible propositions. Employees are enabled to express ideas free from organizational restrictions and even more go beyond by collaboratively gaining commitment and realizing proposed initiatives. Although necessary to establish changes, such an open engagement conflicts with the organizational culture and social control in public organizations. Such efforts need to be followed with endurance, to enable an organization to adapt to changes and observe benefits.

Nonetheless, further investigations are needed to explore the long-term effects of employee engagement regarding organizational performance. Going forward, we aim to explore how the design propositions affect both public organizations. Longitudinal research will show how internal crowdsourcing systems can change organizational cultures. Especially, a combination of a service- and institutional-oriented perspectives for organizational transformation and service innovation with concurrent activities seems worthwhile to investigate, thus, leading to a generalizable set of instruments that help encourage digital transformation. Moreover, as this study focused on public organizations, future research could investigate how the same internal crowdsourcing systems affect private organizations.

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