Governing Nonprofit Platform Ecosystems – An Information Platform for Refugees

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The number of refugees arriving in Europe increased dramatically in 2015. Following arrival at the host country, refugees need access to information on various topics such as applying for asylum, medical care, educational offerings, jobs, or social activities. As many different parties using different channels provide this information, refugees struggle to access relevant information at the right time. Our goal in addressing this information deficit is to support a digital information platform for refugees by developing a governance strategy for the ecosystem of information providers. Within an action research study based on a nonprofit project, we evaluate the implementation of governance mechanisms derived from platform and community governance literature. Our results show that governance mechanisms are implemented differently for nonprofit platform ecosystems than for commercial platform ecosystems. These results enhance the societal impact of the information platform developed in the project. The study contributes to theory on governance of platform ecosystems and IT-enabled collaboration by evaluating established governance mechanisms in the context of nonprofit platforms.

Keywords: Consultation and collaboration across digital differences; eGovernance for good government (eGovernment and eBusiness); Open sourcing; Online communities; IT platform; platform governance

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Introduction

The world has faced a refugee crisis since 2015. In the first half of 2015, the number of refugees under the UNHCR (United Nations' Refugee Agency) mandate reached 14.4 million and increased further in the second half of the year (UNHCR, 2015). The regions of origin of the refugees are conflict-affected countries in the Middle East (e.g., Syrian Arab Republic, Afghanistan) and Africa (e.g., Somalia, Sudan, South Sudan). While the majority of refugees are hosted by neighboring countries, an increasing number has sought asylum in European countries. Approximately 1.26 million refugees applied for asylum in the European Union in 2015, the highest number of asylum seekers since the existence of the EU (Eurostat, 2016).

Upon arrival, refugees not only need to be supplied with necessities such as medical care, food, shelter, and adequate clothing for local weather conditions, they also need information on, for example, how to obtain medical care, how to initiate the asylum process, how and where to participate in language courses, or how to engage in activities with local residents (Qayyum, Thompson, Kennan, & Lloyd, 2015). Unfortunately, relevant information for refugees is collected and distributed by a large number of different sources. Various governmental agencies, non-governmental organizations (NGOs), local initiatives, and volunteers provide parts of the relevant information – albeit using an often-uncoordinated effort. To complicate matters, the information varies from municipality to municipality and becomes outdated quickly due to regulatory amendments or other changes. In counseling programs for asylum seekers, agencies and volunteers try to bundle the most important information, typically by gathering brochures and flyers, and enrich this printed information with their personal experience. While this effort is extremely important and helpful, it may not be the optimal method to disseminate relevant information: brochures may get lost, content may become irrelevant with time or no longer applicable when refugees are relocated, and information relayed orally may be forgotten or misunderstood.

IT can help to overcome this information deficit. First, IT facilitates the collaboration of different actors to produce information (Brown, Scott Poole, & Rodgers, 2004; Cheng & Yu, 2015). Therefore, IT could help different actors to collaboratively collect and edit relevant information for refugees. Second, IT enables the timely and efficient presentation of context-specific information (McKinney & Yoos, 2016) and thus could help to provide refugees with relevant information via a digital channel. As the vast majority of refugees has a smartphone at their disposal (see also the discussion by O'Malley in The Independent, 2015) , information can be communicated via mobile applications as a digital channel. Going beyond that, studies have shown that IT can help to promote social inclusion by allowing refugees to participate in an information society, to communicate effectively despite language barriers, and to better grasp the nuances of the society they have entered (Andrade & Doolin, 2016; Caidi, Allard, & Quirke, 2010; Schreieck, Wiesche, Hein, & Krcmar, 2016).

Given the challenge that information intended for refugees is heterogeneously distributed among different sources and varies from municipality to municipality, an IT-enabled collaboration platform could help to integrate both general and location-specific information for different municipalities. On an IT-enabled collaboration platform, the information provider acts as a complementor by contributing information to the platform, and the refugee acts as a user by consuming this information (Ghazawneh & Henfridsson, 2013). The platform itself acts as intermediary, bringing both sides together (Majchrzak, Markus, Wareham, 2016).

Applying platform governance helps to incentivize complementors to participate in platforms and to manage their contributions. As shown for different commercial platforms, platform governance mechanisms cover, for example, the degree of openness of a platform, control mechanisms like quality checks, or boundary resources such as standardized application programming interfaces (APIs) to enable developers to access the platform (Tiwana, 2014).

Combining these and further governance mechanisms stimulates third party contributions (Manner, Nienaber, & Schermann, 2013).

Existing insights on the governance of commercial digital platforms may not be applicable to nonprofit platforms. In commercial platform ecosystems, the platform owner implements governance mechanisms to manage co-creation of value to capture as much of the generated value as possible (Gawer & Cusumano, 2008). In nonprofit platform ecosystems, governance is applied to increase the societal impact of the co-created value and the platform as a whole. Therefore, the underlying strategic goal is not to incentivize the information provider monetarily but to engage them morally in a societal context. Given this situation, the application of platform governance has not, to the best of our knowledge, been discussed. Addressing this gap, we pose the research question: *"How can governance mechanisms be applied to stimulate third-party contribution in nonprofit platform ecosystems?"*

To answer this question, we analyze the application of governance mechanisms on an information platform for refugees within an action research study. We conducted the study within a nonprofit project dedicated to the implementation of an information platform for refugees. At the time of the study (October 2015 – March 2016), the platform had already been used in several municipalities of a European country. Based on governance mechanisms derived from platform governance and community governance literature, the researchers configured governance strategies that were evaluated during two cycles of the action research study. As a result, a sustainable governance strategy was developed that supported onboarding of information providers and ensured their motivation to keep the information updated. Our results provide guidance on how to set up a nonprofit platform governance. In addition, the discussion of the results contributes to IS research in the field of platform governance as part of the literature on co-creation of value for societal impact.

Our study contributes to recent literature in a threefold manner. First, we discuss the application of platform governance mechanisms within a nonprofit context, contributing to literature on IT platforms. Second, we enrich knowledge on IT-enabled collaboration within communities given the fact that the community consists of distributed voluntary workers. Third, our findings relate to research that analyzes how information and communication technologies support social movement organizations in general (Selander & Jarvenpaa, 2016) and in the specific context of refugees (Andrade & Doolin, 2016). Our findings are also of interest for practitioners in social movement organizations and for those involved in e-government projects, i.e. projects that provide government services to citizens via digital channels (Adeleke & AbdulRahman, 2011; Balta, Greger, Wolf, & Krcmar, 2015; Kuk & Janssen, 2013). The governance strategies we developed might help these practitioners to improve the IT-enabled collaboration in their projects.

In the remainder of the paper, we first present related work from platform and community governance, deriving a set of relevant governance mechanisms. After describing the method of action design research, we picture the project, which serves as a testbed for the development of governance strategies. We then describe the results of the study that yielded a suitable governance strategy. Finally, we discuss the implications of our study.

Theoretical Background

An information platform for refugees can only unfold its societal impact if heterogeneous information providers collaborate on the platform. The collaboration between information providers is IT-enabled, i.e. supported by an IT platform. Through collaboration on the platform, the information providers co-create value and need to be governed such that the co-creation of value is maximized (Grover & Kohli, 2012). To review our current understanding of governance in platform ecosystems and IT-enabled collaboration communities, we review and integrate literature from both areas.

Value Co-Creation through Platform Ecosystems

IS research has acknowledged the role of IT in enabling co-creation of value in the development and commercialization of technologies (Boudreau, 2010; Nambisan, 2013). In particular, digital platform ecosystems foster innovation, software development, and the provision of services (Schreieck, Hakes, Wiesche, & Krcmar, 2017; Schreieck & Wiesche, 2017). In a broad sense, platforms can be defined as "foundational products, services, or technologies upon which additional complementary products, services or technologies can be developed" (Gawer, 2009). If a platform is open to the outside ("external platform" versus "internal platform"), the additional complementary products, services, or technologies are developed by third parties as part of a co-creation of value process. As a result, an ecosystem of complementors is created around the platform. We understand platform ecosystems as "a set of actors functioning as a unit and interacting with a shared market for software and services, together with the relationships among them" (Jansen, Brinkkemper, & Finkelstein, 2009).

The process of co-creation of value has been analyzed for a plethora of digital ecosystems. A large part of the literature discusses application platforms for handheld computing systems such as Google Android and Apple iOS (e.g., Benlian, Hilkert, & Hess, 2015; Eaton, 2015; Liu, Au, & Choi, 2014). Further investigations of co-creation of value for digital ecosystems cover gaming platforms such as PlayStation and Xbox (Lin, Li, & Whinston, 2011), e-commerce platforms such as Alibaba (Koh & Fichman, 2012), and digital content platforms such as YouTube or Amazon Kindle (Lusch & Nambisan, 2015). All these examples show how co-creation of value can enhance the success of a commercial platform.

Co-creation of value through platform ecosystems has not yet been analyzed for social causes. While the role of IT to support nonprofit projects has increasingly received attention in IS research (e.g., Andrade & Doolin, 2016; Selander & Jarvenpaa, 2016), digital platforms and their potential for social causes are often neglected. By enabling co-creation of value, digital

platforms can bundle the knowledge and experience of different actors involved in a nonprofit project. In the case of an information platform for refugees, municipalities, private initiatives, and other providers of information collaborate on the digital platform to collect, condense, and attractively present relevant information for refugees. Not surprisingly, co-creation of value through digital platforms is an important area of research in the context of nonprofit organizations and e-government.

Platform Governance

To establish successful platform ecosystems, not only is the platform's architecture decisive, but also the governance of the ecosystem that surrounds the platform (Tiwana, Konsynski, & Bush, 2010). According to Tiwana (2014), platform governance can be defined as the "partitioning of decision-making authority between platform owners and app developers, control mechanisms, and pricing and pie-sharing structures". While Tiwana's dimensions of platform governance are tailored to software application platforms, other authors identify aspects of platform governance by analyzing diverse types of digital platforms. To structure the aspects of platform governance discussed in literature, we derive a set of governance mechanisms that include the dimensions suggested by Tiwana and mechanisms from other studies including mechanisms we identified in an earlier literature study (Hein, Schreieck, Wiesche, & Krcmar, 2016; Schreieck, Wiesche, & Krcmar, 2016).

The first mechanism relates to the overall governance structure, which can be decentralized or centralized (Nambisan, 2013). This refers to the partitioning of decision rights and the ownership status of the platform (Tiwana, 2014). The second mechanism refers to accessibility and control of platform ecosystems. A platform ecosystem needs to be open to a certain degree (Eisenmann, Parker, & Van Alstyne, 2009) but openness needs to be accompanied by control mechanisms to avoid uncoordinated effort hindering co-creation of value (Ghazawneh & Henfridsson, 2013; Tiwana, 2014). Control mechanisms include formal

control as in input and output control and informal control as in self and clan control (Goldbach & Benlian, 2015a). Trust forms the third mechanism, which relates to the measures of a platform ecosystem to enhance trust and reduce perceived risk (Hurni & Huber, 2014; Nambisan, 2013) on the complementor or user side. As the continuous interaction of complementors and users is vital to platform ecosystems, trustful relationships must be built. The fourth mechanism summarizes boundary resources, which represent all kinds of resources a platform provides for complementors (Eaton, 2015; Ghazawneh & Henfridsson, 2013). These may cover documentation on the platform, tools, or APIs. In most platform ecosystems the mechanism of pricing is relevant as an additional mechanism (Caillaud & Jullien, 2003; Tiwana, 2014). As the refugee information platform is a voluntary project void of financial transactions on the platform, we will not include this mechanism in our study.

Community Governance and IT-Enabled Collaboration

An information platform for refugees is dependent on a platform ecosystem with heterogeneous information providers that collaborate in communities. While application developers of software platforms can develop complementary applications individually, information providers need to create the information together as part of a temporary information network (Pan, Pan, & Leidner, 2012). A community is necessary to compile the information for each municipality providing information on the platform. Local communities need to cooperate with other communities to avoid redundant work, which may prove difficult due to the autonomy of different municipalities. Overcoming challenges of this kind has been identified as one of the key objectives of collaboration between governmental agencies in developing countries (Ezz, Papazafeiropoulou, & Serrano, 2009).

The setup of our study is similar to other community projects such as knowledge communities (e.g., Wikipedia) or open source communities (e.g., Linux). IS researchers have in particular worked on open source communities to derive governance mechanisms and

strategies for IT-enabled collaboration in online communities (O'Mahony & Ferrarro, 2007; Shah, 2006; Teixeira & Lin) as well as on the importance of those communities in developing countries (Ahmed, 2007; Hatakka, 2009).

The governance of online communities faces issues similar to those faced by the governance of platform ecosystems. One example might be trust, which is not only an important governance mechanism in platform ecosystems but also crucial for collaboration in online communities (Cheng, Nolan, & Macaulay, 2013) and distributed teams (Cheng, Fu, & Druckenmiller, 2016; Cheng, Yin, Azadegan, & Kolfschoten, 2016). Furthermore, in both communities and platform ecosystems, third parties contribute to a joint project and need to be incentivized and managed throughout the period of participation. According to Sagers (2004): "a project must deal with the complexity of coordinating the efforts of a geographically distributed base of volunteers to create a working software product." Mechanisms to govern communities are discussed by Markus (2007) and De Laat (2007). According to Markus (2007), community governance includes six categories of formal and informal structures and rules: ownership of assets, chartering of the project, community management, software development process, conflict resolution, and use of information and tools. The mechanisms proposed by De Laat (2007) cover modularization, division of roles, delegation of decision-making, training and indoctrination, formalization, and the tradeoff between autocracy and democracy.

These mechanisms are related to the mechanisms of platform governance discussed above. We integrate the mechanisms of community governance and the mechanisms of platform governance in a summary table (Table 1).

-- Insert Table 1 about here --

The summary of governance mechanisms across platform governance and community governance identifies which aspects of governance are relevant for a project such as an information platform for refugees. However, it remains unclear how these mechanisms can be

implemented in the context of nonprofit platform ecosystems. Existing recommendations, as for example those proposed by Tiwana (2014) or Gawer and Cusumano (2013), are based on commercial platform ecosystems such as application platforms and industry platforms.

Nonprofit platform ecosystems differ from commercial platforms in several ways. While in commercial platforms the platform owner can compensate complementors for centralized governance via pricing mechanisms, this mechanism is not available in nonprofit platform ecosystems. Owners of nonprofit platforms are also unable to implement or coerce control. As a result, the platform owner may need other measures to maximize value creation within the platform ecosystem. The mechanism of trust might gain importance in nonprofit platform ecosystems as complementors invest their effort voluntarily without expectations of direct benefit. While trust is also relevant for complementors in commercial platforms (Hurni & Huber, 2014), it is a decisive factor for nonprofit organizations in general (Bekkers, 2003). Because nonprofit platforms depend on contributions from third parties to carry out their daily work, trust is not only important for their reputation but is also a prerequisite for third parties with potential interest in contributing to the platform.

In summary, existing research helps to identify governance mechanisms relevant for nonprofit platform ecosystems. Yet, our current knowledge is not sufficient to understand how governance mechanisms can be applied in order to successfully bring together and manage the IT-enabled collaboration of various actors on a nonprofit platform. In particular, incentivizing the actors to contribute to the platform while at the same time controlling them is an open issue for nonprofit platforms. We address this gap with an action research study focusing on governing information providers within an information platform ecosystem.

Method

We conducted an action research study to develop a strategy for the governance of an information platform ecosystem for refugees. Action research has been defined as “a post-

positivist social scientific research method, ideally suited to the study of technology in its human context" (Baskerville & Wood-Harper, 1996). We chose this methodology for two reasons. First, action research is applicable to evaluate a complex and rare phenomenon not suitable for empirical analysis (Mathiassen, 2002). The ecosystem of an information platform is complex due to a large number of heterogeneous information providers. As a result, the development of a suitable governance strategy is also a complex and challenging process. Governance strategies for these types of information platforms are rare: the first digital information solutions for refugees emerged in 2015 and only a few of them have been established successfully. Second, action research is adequate if it is necessary to not only gain insights on a phenomenon but also to directly apply the knowledge in practice to advance the project (Mathiassen, 2002). Due to the criticality of the situation of refugees arriving in Europe, it made sense to directly apply the developed governance strategy in order to help refugees as soon as possible.

Action research studies are a special form of case studies. In contrast to traditional case studies where researchers observe the object of the study, in action research studies the researchers actively participate in the project to both take and evaluate actions (Yin, 2009). This participatory design was possible as the authors were part of the project team. As part of the project team, we implemented platform governance mechanisms to stimulate third-party contribution to the platform. The effect of these interventions was evaluated based on usage data and additional insights from workshops and interviews with information providers.

We followed the cyclical process of action research along five steps (Susman, Evered, Susman, & Evered, 2012; Ziegler, 2001): (1) *Diagnosing* to identify or define the problem at hand; (2) *Action Planning* to consider alternative actions that can be taken to solve the problem at hand; (3) *Action Taking* to select suitable actions and implement those actions; (4) *Evaluating* to assess the consequences of the actions taken; (5) *Specifying Learning* to gain general insights

from the approach taken to tackle the project at hand. We ran through this process twice to develop a governance strategy for the information platform for refugees. To ensure rigor and relevance of our action research study, we evaluated the study against the five evaluation principles for action research studies as laid out by Davison, Martinsons, and Kock (2004). As summarized in Table A.1 of the Appendix, our study fulfills the *Principle of the Researcher–Client Agreement*, the *Principle of the Cyclical Process Model*, the *Principle of Theory*, the *Principle of Change through Action*, and the *Principle of Learning through Reflection* (Davison et al., 2004).

The Case of *INTEGREAT*[2]

Before evaluating governance strategies, this section pictures the case that frames the action research study. We first provide an overview of the project *INTEGREAT* and then describe the main governance challenges faced by the project.

Project Description

The point of departure of the project *INTEGREAT* was the arrival of a large number of refugees in Europe in summer 2015 who then encountered a lack of information about their new environment (see also Qayyum et al., 2015). This information deficit is a direct result of the complex information ecosystem faced by refugees. As illustrated in Figure 1, refugees are dependent on information related to various topics that can be roughly clustered as follows: information on first steps related to registration and government requirements, points of contact, language, health care, education and work, family and daily life. A large number of different information sources addressing these information needs are available. In addition to the high

[2] www.integreat-app.de.

heterogeneity in the information sources, the information is dynamic and in some cases quickly outdated. Local points of contact may change, new offers may be introduced, and adjustments made to the asylum process. Refugees are often relocated after arrival at an initial reception facility making parts of the information inaccurate for later use (Schreieck, Zitzelsberger, Siepe, Wiesche, & Krcmar, 2017).

-- Insert Figure 1 about here –

The project *INTEGREAT* strives to address the information deficits of refugees. *INTEGREAT* is a mobile application that provides relevant information for refugees via a smartphone application. The app comprises general information as well as specific information of relevance in the respective municipality. Users choose the municipality according to their location when they open the app. The information provided in the app is also available offline. Refugees usually have only sporadic access to the internet as they use local Wi-Fi hotspots and generally do not have mobile service. The app is available in different languages: In addition to English, French and German, the languages of the major countries of origin are included, in particular Arabic and Farsi. The mobile app was developed in Android as our experience during the project was that the majority of refugees uses smartphones with this operating system. Exemplary screenshots of the INTEGREAT mobile app are shown in Figure 2.

-- Insert Figure 2 about here --

The counterpart of the mobile app is the backend, which is used to input the information displayed in the app. The backend comprises a content management system (CMS) based on WordPress. WordPress is a free open source software to build blogs, websites and CMS (WordPress, 2016) and was chosen as it is the most successful available free tool for websites and is therefore very likely to be further developed and maintained in the future. The basic configuration of WordPress was enhanced by available plugins to support, for example, multi-language sites. Some plugins were developed by the project team to address specific needs of

the users such as a multi-language PDF export of information in case refugees do not have a smartphone.

A municipality wanting to use the system is granted access to a dedicated instance of the CMS backend realized via a multi-site setup of the WordPress-powered CMS. The instance is prefilled with general information common for all municipalities including information on the asylum evaluation process. Users from the municipality can then decide to edit the available general information and start to add information specific to their municipality. As the information for one municipality is distributed among a large number of information providers, an arbitrary number of users can be granted access to the system. The user management comes with a fine-grained rights management. For example, a local initiative that organizes regular events for refugees can be granted access only to the Events section of the CMS. In this way, a local community of information providers emerges. In summary, the project *INTEGREAT* provides a stable core architecture that forms the basis of the information platform as pictured in Figure 3.

-- Insert Figure 3 about here ---

The setup of the project as a platform allows different information providers and stakeholders to interact with the project team and the system. These groups need to be considered when developing a governance strategy. Besides the core team and developers, municipalities, NGOs, local initiatives, and volunteers are the main information providers (Figure 1). The municipalities run several offices such as the social assistance office or the youth welfare office who possess valuable information. NGOs and local initiatives have gained domain-specific knowledge through their continual work with refugees and volunteers and are able to add specific information such as event information. Sometimes the information providers pursue different goals and are driven by a different political agenda making the governance of the ecosystem more challenging.

Governance Challenges

Managing the ecosystem of information providers and stakeholders emerged as the main challenge for the project *INTEGREAT*. Although some technical challenges arose in the course of the project, for example, related to the interplay of plugins in WordPress, these challenges never represented a serious risk for the project. Instead, the main issues were related to the acquisition of information providers, the identification of relevant contact persons in the municipalities, and the handling of information overflow often produced by the providers of information. As the platform ecosystem grew, further issues arose. The motivation of information providers had to be ensured and a decentralized method to organize information providers that at the same time ensured content quality had to be established.

The description of the main challenges makes clear the necessity of a governance strategy to manage the heterogeneous community of information providers. The governance mechanisms derived from literature, i.e. governance structure, accessibility and control, boundary resources, and trust can help to address these challenges. However, literature does not provide insights on how to apply these mechanisms in the context of *INTEGREAT*. Accordingly, the project team was unsure how centralized the governance should be structured in order to keep the project manageable while incentivizing decentral information providers. The team had to decide whether to apply formal control mechanisms to ensure content quality or whether to rely on informal mechanisms. In addition, we were unsure how to build trust between the different parties and which boundary resources should be provided for information providers. Therefore, it was crucial for the project's success to evaluate how the governance mechanisms as part of a sustainable governance strategy should be best implemented.

Governance Strategy

A governance strategy is the result of the planned implementation of governance mechanisms

in a specific configuration (see also Schwarz & Hirschheim, 2003). We derived the following governance mechanisms from platform and community governance literature: governance structure, accessibility and control, trust, and boundary resources. Within an action research study with two cycles, we define, evaluate, and refine the implementation of these mechanisms as part of a governance strategy. The effectiveness of the strategy was measured using the number of new municipalities that implemented *INTEGREAT* and the activity level[3] on the content management system of the platform. We enhanced the quantitative analysis with qualitative insights from workshops, interviews, and surveys conducted with information providers and refugees as summarized in Table 2. Throughout the Results section, we will refer to these insights. We analyze the two action research cycles following the phases of an action research study as described by Susman et al. (2012): Diagnosing, Action Planning, Action Taking, Evaluating, and Specifying Learning.

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First Action Research Cycle

The first action research cycle to develop a governance strategy of the *INTEGREAT* platform started when the basic functionalities were implemented for the first municipality in October 2015. The positive feedback the project received in the media and from other municipalities made it clear that *INTEGREAT* could be beneficial for all municipalities hosting a substantial number of refugees. Therefore, the research team together with the project team decided to roll out the information platform, requiring a governance strategy to incentivize and manage information providers.

Diagnosing and Action Planning. In the first two months after the start of *INTEGREAT* in the

[3] Activity was measured as the number of ‘save’ and ‘edit’ operations performed in the CMS.

first community, more than 20 municipalities and associated information providers were interested in the platform and requested information on how it could be introduced in their municipality. It was not sufficient to just grant the municipality access to their own instance of the CMS. New municipalities needed to be supported to onboard successfully and in a sustainable way. Literature shows that the initial phase of a platform ecosystem is decisive for its success (e.g., Evans & Schmalensee, 2010). Therefore, the project team together with the researchers developed actions suited to govern the heterogeneous information providers.

Action Taking. Actions were taken across all governance mechanisms to support the integration of new municipalities in the ecosystem (Table 3). The governance structure had to be decentralized in order to incentivize volunteers and to cope with the decentralized information structure. Therefore, new municipalities were given direct access to the system and the possibility to enter and structure information in their preferred way. Similarly, restrictions were minimized for the mechanism accessibility and control. Barriers for new members were reduced by making the CMS as intuitive as possible and no dedicated control process was introduced to prevent the demotivation of information providers. To strengthen trust in the project and its sustainability, the project collaborated with an established initiative that has been engaged in work with refugees for more than two decades and with a renowned university. Boundary resources were distributed by the team members on an individual basis through, for example, individual counseling of information providers wanting to use the platform.

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Evaluating and Specifying Learning. The evaluation of the number of new municipalities that implemented the information platform showed that the governance strategy was efficient regarding the onboarding of complementors on the platform. In the first month, six municipalities requested to roll out the system in their area and initiated the collection of

information followed by a roll out by nine municipalities in the second month (Figure 4). Based on feedback from the contact persons, we identified the governance actions that had the largest impact on the onboarding decision. It was important that the CMS was intuitive to use as information providers from municipalities, NGOs, and local initiatives were not as IT-savvy as initially expected (I_1, Table 2).

Collaboration with an established initiative in the area of asylum counseling had proven helpful in enhancing the complementors' trust in the platform ecosystem (W_1, Table 2). However, the analysis of activity data on the CMS showed that after the first two months, the activity level of information providers declined (Figure 5). Some municipalities lost interest shortly after onboarding and others gathered most of the relevant information but did not manage to finalize it. Furthermore, a quality check of the information on the platform revealed an overflow of unstructured information in some topics, while others were not covered (S_1, Table 2). As this unstructured information was, for some municipalities, visible in the app, this posed a threat to the project's reputation.

Given the learning of the first action research cycle, the onboarding-focused governance strategy was in part successful in the early phase of the project but needed refinement to improve the sustainability of the involvement of the information providers.

Second Action Research Cycle

The governance strategy in the first action research cycle had resulted in onboarding of a significant number of municipalities. Local media coverage, dedicated articles in journals for mayors of municipalities and other members of bodies of the government as well as information distributed via social media sparked interest in the project. However, onboarding had not been sustainable for all municipalities. Therefore, the governance strategy was adapted with a stronger focus on sustainability. The goal was to enable continued onboarding while at the same

time ensuring that the municipalities would not lose interest.

Diagnosing and Action Planning. Although the pilot municipality successfully introduced the platform, not all of the municipalities that started using the platform finished the introduction process of the *INTEGREAT* app. Those who finished the implementation had included a lot of unstructured information potentially leading to an information overflow for the user. The main challenge of the second action research cycle was therefore to identify governance actions that increase the information providers' motivation and at the same time improve the quality of the provided content. The underlying tradeoff between the openness of platform ecosystems and control of complementors is a known issue in research on commercial platform ecosystems (e.g., Benlian et al., 2015; Boudreau, 2010).

Action Taking. Actions were taken across all governance mechanisms to refine the governance strategy (Table 4). For the governance structure, elements of a more centralized governance were introduced in order to improve the quality of content on the information platform. It was decided to introduce a standardized structure for the content that had to be implemented by municipalities. The so-called 6+2 concept comprises six predefined chapters of information and two chapters to be defined by the individual municipality. This structure should not only make the information more easily searchable, but also increase the "brand recognition" of the *INTEGREAT* app. To balance the more centralized governance structure, the possibility to market the app as a stand-alone information app by a certain municipality was introduced. While the app would adhere to the "corporate identity" of *INTEGREAT*, the commitment of the municipality would become more visible increasing the motivation of the people involved. A more structured onboarding process and a pragmatic input control were introduced for the governance mechanism accessibility and control. A structured onboarding process helped municipalities to better understand the scope of the project and estimate the resources they needed to invest in the project. The input control was assigned to one responsible person per

municipality. In this way, input control was decentralized yet formalized. While decentralized control might be less effective than centralized control, it addressed the problem of missing perceived legitimation of the platform owner to implement control. Trust had emerged as an important factor in the first research cycle. Consequently, the founding of a nonprofit association[4] was emphasized; it was thought that the establishment of a legal entity behind the project would serve to strengthen the information providers' trust in the project. Furthermore, open sourcing of the *INTEGREAT* project's source code along with the content of the platform contributed to the project's credibility. Intangible boundary resources were implemented in the second research cycle to support municipalities in compiling relevant information on the platform in a structured way. First, a dedicated community manager who consults the responsible contact person on how to manage the local community of information providers was introduced. Second, to improve the exchange of information and best practices among municipalities, conferences were organized and a common communication tool was introduced. Both measures are known to improve the meta-knowledge of the involved information providers, i.e. the knowledge of 'who knows what' and 'who knows whom' (Leonardi, 2014). As tangible boundary resource, translation support was provided by making automated translation accessible in the CMS and by cooperating with a professional translation agency.

-- Insert Table 4 about here --

Evaluating and Specifying Learning. After the implementation of the new "sustainable" governance strategy, the activity on the platform increased significantly while at the same time new municipalities continued to onboard (see Figure 4 and Figure 5). The values for activity in December 2015 and January 2016 were affected by the Christmas holidays but February and March 2016 showed a substantial increase in activity. The information provided on the platform

[4] Tür an Tür Digital Factory gGmbH, http://tuerantuer.de/digitalfabrik/.

became more complete and structured for the new municipalities compared to the first action research cycle. Municipalities reported that the hierarchical 6+2 concept in the CMS helped them to structure the information better (S_2, Table 2). The founding of an NGO convinced municipalities and information providers that the *INTEGREAT* project would be sustainable and therefore they were motivated to contribute on a long-term basis (e.g., W_3, Table 2). Information providers welcomed the boundary resource of automated translation (S_2, Table 2).

In sum, the "sustainable onboarding" governance strategy was a successful enhancement of the "onboarding" governance strategy applied in the first action research cycle. Based on discussions with contact persons in the municipalities, the balance of more guidance and stronger trust in the societal impact of the project were key to an effective governance strategy.

-- Insert Figure 4 and Figure 5 about here --

Discussion

In this section, we discuss how our findings inform the application of governance in nonprofit platform ecosystems as compared to commercial platform ecosystems. We then discuss the contributions our work makes to theory and practice in the area of governance.

Governance in Nonprofit vs. Commercial Contexts

The governance strategy we developed in our study differs from strategies known from commercial platforms along the mechanisms governance structure, accessibility and control, trust, and boundary resources. The implementation of each governance mechanism is affected by the fact that the platform is non-commercial and serves a social cause (Table 5).

-- Insert Table 5 about here --

As decentralized governance had led to an unstructured accumulation of information on the platform, we adopted a more centralized governance strategy. This may in turn have negatively affected the complementors' motivation as they lose decision rights. In commercial platform ecosystems, the platform owner can compensate complementors for centralized governance by providing resources and sharing revenues. In some cases, centralization can be enforced due to the dominant market position of the platform owner (see Eaton, 2012 for the case of Apple). By contrast, in nonprofit platform ecosystems, revenue sharing is not available as a compensation for complementors and a dominant market position of an NGO does not necessarily help to enforce governance mechanisms. Instead, centralizing governance in nonprofit platform ecosystems can be built on establishing a relationship which fosters co-creation and openness (Loudon & Rivett, 2014). In the *INTEGREAT* project, participating municipalities were supported in hosting a press event and had the opportunity to be an associated partner of the project.

By implementing the governance mechanisms accessibility and control, we found that in an information platform for refugees, input control is necessary to ensure the quality of information. In commercial platform ecosystems, formal and informal control mechanisms are applied by the platform owner in a centralized manner to ensure quality. The platform owner is legitimized by ownership and by his market power. In nonprofit platform ecosystems, applying control can negatively influence the complementors' motivation: from their point of view, the platform owner has no legitimation to apply control. Contributors to nonprofit projects often have a specific idea of how they want to contribute and may be unwilling to adhere to control processes. Therefore, informal control mechanisms such as self and clan control may be more effective than formal control mechanisms. Clan control can be strengthened by establishing a community with shared norms and values (Goldbach & Benlian, 2015b). In the project *INTEGREAT*, control processes were assigned to experienced information providers within the

local communities of information providers. Due to their expertise, they were perceived by the other information providers as legitimated to apply control.

The mechanism trust may have greater importance in nonprofit platform ecosystems than in commercial platform ecosystems. In commercial platforms, the interplay of trust and power affects the relationship between platform owner and complementors (Hurni & Huber, 2014). The complementor has to trust in the reliability of the platform and in the platform owner's intention to continue the platform (Goldbach & Benlian, 2015a). In nonprofit platform ecosystems, this trust in the platform is enhanced by trust in the community of complementors (Cheng et al., 2013) and their shared norms and values (Tiwana, 2014). Therefore, establishing trust between platform owner and complementors as well as among complementors is vital to nonprofit platform ecosystems. Only when complementors have trust in the platform and the community, their initial motivation will translate into engagement on the platform.

Finally, boundary resources have to be implemented differently in nonprofit than in commercial platform ecosystems. In commercial platform ecosystems, standardized boundary resources such as documentation, tutorials, APIs and SDKs facilitate the onboarding of a large number of complementors. While documentation and easy-to-use interfaces are also helpful in community-driven nonprofit platform ecosystems, the implementation of boundary resources needs to support the community building. Labeled as "indoctrination" by De Laat (2007), measures such as nominating local community managers or holding conferences to connect information providers are boundary resources that enhance the community. Tools that make communication visible (e.g., Slack) further strengthen value creation by the community by increasing meta knowledge of community members (Leonardi, 2014). Boundary resources need to be better adapted to the individual complementor and his community.

In summary, governance strategies for nonprofit platform ecosystems differ from those for commercial platform ecosystems in IS. While the same governance mechanisms are applied,

they cannot be implemented as effectively in nonprofit as in commercial platform ecosystems due to a perceived weaker position of the platform owner. By making concessions to the complementors in the implementation of a governance strategy, the platform owner can still use platform governance to maximize value co-creation and, as a result, the societal effect of the platform ecosystem.

Contribution to Theory

With our study we contribute to three streams of research: (1) platform governance, (2) IT-enabled collaboration, and (3) IT for development with a focus on refugees.

Scant literature exists on platform governance to manage co-creation of value in nonprofit contexts. The goal of the platform owner is not to capture as much value as possible, but rather to maximize societal impact via co-creation of value. This affects the implementation of platform governance. In our study we show that the governance of nonprofit platform ecosystems is based on the same underlying mechanisms as for commercial platforms but the implementation of the mechanisms differs. Whereas in for-profit platform ecosystems, platform governance aims at maximizing value co-creation along with value capture of the platform owner, in non-profit platform ecosystems, platform governance helps to stimulate value co-creation in a way that the co-created value is beneficial for society. Furthermore, as nonprofit platform ecosystems are to a greater degree community-driven, the implementation of platform governance is informed by community governance. The integration of community governance concepts is new to platform governance research as platform governance mainly focuses on the perspective of the platform owner. Finally, our study contributes to the literature stream on how information and communication technologies can support nonprofit projects (e.g., Selander & Jarvenpaa, 2016) and in particular the integration of refugees (Andrade & Doolin, 2016).

By developing governance strategies for communities of information providers that work together via a digital platform we also contribute to literature on IT-enabled collaboration.

Online communities are one way IT enables collaboration among diverse parties as evidenced by knowledge communities (e.g., Wikipedia) or open source communities (e.g., Linux). There are both online communities with a dedicated commercial purpose, such as idea platforms created by companies (Blohm, Bretschneider, Leimeister, & Krcmar, 2011), and nonprofit online communities, such as Wikipedia and most open source projects (Teixeira & Lin). While companies that run commercial communities can grant monetary incentives to govern collaboration within the community, governance in nonprofit communities is more difficult. Although O'Mahony and Ferrarro (2007) and Shah (2006) analyze this situation for open source projects, we are able to add to their findings for the context of a nonprofit information platform. In particular, we show that the design of the IT artefact that enables collaboration is an important factor influencing collaboration. In the case of *INTEGREAT*, the design and usability of the CMS laid the basis for the implementation of community governance mechanisms. Building on the IT artefact, governance mechanisms such as fostering trust can be applied and spark collaboration on the platform (Cheng, Yin, et al., 2016).

Developing and governing a digital platform that supports both information gathering and information seeking is a first step toward understanding the role of information systems in a globalized world challenged with poverty, persecution, and migration swapping in the global North (Heeks, 2008; Qureshi, 2015). Understanding governance mechanisms for nonprofit platforms is a necessary first step to support collaboration between countries, municipalities, volunteers, and refugees to address the information needs of refugees (Andrade & Doolin, 2016). These findings may also inform in a more general way the coordination of social movement organizations in both developing and developed countries (Selander & Jarvenpaa, 2016).

Contribution to Practice and Society

First, our study directly contributed to the societal impact of the information platform

ecosystem for refugees *INTEGREAT*. By developing a suitable governance strategy, not only did the ecosystem of information providers grow, but also the number of apps installed reached more than 3,300. Thereby, the information gathered on the platform reached the target group and helped to overcome the information deficit of refugees arriving in Europe. Overall it can be shown that important information needs for refugees (Caidi et al., 2010) can be satisfied with the nonprofit platform solution. Especially the boundaries of cross-cultural communication, a major limiting factor for information sharing (Bajwa, Lewis, Pervan, & Lai, 2014; Caidi et al., 2010), can be addressed by offering multi language support customized to the individual needs of refugees residing in different municipalities. The information platform will not be able to replace face-to-face asylum counseling but it can make counseling more efficient as basic information is already provided on the platform. For example, the possibility to update information directly in the system reduces the effort required to inform individual refugees about relevant changes. The knowledge on platform governance gained from this study will inform the way new features will be developed and maintained by the community. For example, an offline map and a navigation feature is being developed but it will only be useful if the community provides up-to-date point of interests for the users (see also Pflügler, Schreieck, Hernandez, Wiesche, & Krcmar, 2016).

Second, the contribution of our study is applicable to other platform ecosystems that enable co-creation of value in a nonprofit context. In e-government the potential of co-creation of value is underrated (Adeleke & AbdulRahman, 2011; Kuk & Janssen, 2013). Citizen involvement platforms are one example of co-creation of value in e-government that may benefit from insights on the application of governance. Our study provides an overview of the governance mechanisms that need to be considered by platform owners and suggests an adequate implementation of these mechanisms as part of a governance strategy.

Lastly, the concepts we developed on governing nonprofit platforms can be applied to support developing countries by establishing collaboration and knowledge sharing. However, when developing and implementing nonprofit platforms in developing countries, factors such as the technological development of the country, age, education and income of the targeted users, and possibly geographic location (e.g., whether it is more rural or urban territory) need to be taken into consideration (Loudon, 2016).

Conclusion

In this study we derive a governance strategy for a nonprofit platform ecosystem. By conducting an action research study within the project *INTEGREAT*, an information platform for refugees, we combine governance mechanisms to a suitable governance strategy. Our results push the project *INTEGREAT* forward and thus help to overcome the information deficit that refugees face when they arrive in a host country.

The study thereby contributes to co-creation of value theory in the context of nonprofit platform ecosystems. While the same basic governance mechanisms are relevant to foster co-creation of value, nonprofit platforms cannot rely heavily on a centralized governance structure, strict control, and standardized boundary resources. Instead, the governance structure needs to be carefully balanced and trust is a key component of the governance strategy. Our findings furthermore enhance literature on IT-enabled collaboration in nonprofit communities as we show how decentralized local communities of information providers can efficiently collaborate via a digital content management system.

Our study entails several limitations. First, the scope of our action research study is limited. We analyze one case only as the phenomenon at hand, i.e. information platform ecosystems for refugees. Although the project includes a productive information community used by several communities, it is a relatively small platform ecosystem compared to commercial platform ecosystems. By conducting two cycles of an action research study, we

obtained in-depth insights into the platform which we compare to current literature on platform governance and IT-enabled collaboration. We therefore believe that the findings of our study are generalizable for nonprofit platforms. Nevertheless, follow-up studies with multiple cases and international NGOs could validate our results, perhaps by applying quantitative methods. Second, as a corollary of conducting an action research study, the active participation of researchers in the project impedes their objectivity. We have addressed this limitation by using adopting triangulation techniques such as interviews, workshops, and surveys to increase the objectivity of our results. Still, traditional case studies could help to minimize methodological bias.

Previous research has showed that collaboration systems also work for developing countries like Tanzania and South Africa (De Vreede, Mgaya, & Qureshi, 2003), so the next step could be testing social platforms in those regions. Another interesting aspect could be the implementation of collaboration aspects like voting features in order to increase the effectiveness and efficiency of the overall platform (Cheng & Yu, 2015). Finally, to better understand the impact of IT for refugees, it could be interesting to analyze the benefit of information platforms. In this context, it would be worthwhile to consider the digital divide (Ahmed, 2007; Norris, 2001) and what measures could be applied to overcome the digital divide for refugees. For example, a series of qualitative interviews with refugees and asylum counselors in municipalities could contribute to deepening our understanding of the value of IT for the social inclusion of refugees.

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Appendix

Table A.1. Evaluation of the five principles of action research studies by Davison et al. (2004).

Principle	Description	Evaluation
Principle of the Researcher–Client Agreement	This principle ensures that researchers and clients (i.e. the practitioners) agree on conducting an action research study and on a common goal.	Researcher and practitioners agreed that a cyclical action research approach was suitable due to the criticality of the situation. The project goal and project responsibility were specified explicitly.
Principle of the Cyclical Process Model	This principle fosters an action research study's rigor by ensuring that all five phases of an action research process are conducted systematically.	As described in the results section, our study comprised two action research cycles following Susman et al. (2012).
Principle of Theory	An action research study has to be linked to existing theory in order to be of scientific relevance.	Our study builds on and contributes to literature on co-creation of value through platform ecosystems as well as to literature on IT-enabled collaboration.
Principle of Change through Action	This principle ensures that actions are taken within the scope of the action research study that contribute to solving the diagnosed problem.	In our study, we implemented governance mechanisms to derive a suitable governance strategy for an information platform ecosystem. The effects of these actions were documented and evaluated based on performance indicators of the platform as well as insights from interviews, workshops, and surveys with information providers.
Principle of Learning through Reflection	To ensure an action research study's relevance, this principle highlights that insights gained from the specific case need to be generalized in order to be applicable in other contexts as part of a reflection process.	In our study, researchers and clients together discussed the learnings based on the evaluated results. By linking these insights to the theory of co-creation of value in platform ecosystems in the discussion section, we generalize the findings of our study.

Tables and Figures from Body

Table 1. Mechanisms of platform and community governance.

Mechanisms	Platform governance	Community governance
Governance structure	• Centralized vs. decentralized • Distribution of decision rights • Ownership status	• Autocracy/democracy • Chartering rules • Ownership of assets • Division of roles, delegation of decision-making
Accessibility & control	• Openness • Control mechanisms	• Software development process • Formalization • Modularization
Trust	• Trust building • Minimization of perceived risk	• Conflict resolution
Boundary resources	• Resources and documentation • Transparency	• Training and indoctrination • Use of information and tools • Community management

Table 2. Sources of qualitative insights.

ID	Type	Participants	Date
W_1	Workshop	• Three employees of the social office of a German municipality considering introducing *INTEGREAT* • Three members of the *INTEGREAT* project team	October 21, 2015
I_1	Interview	• Chairperson of a nonprofit association. She led the introduction of *INTEGREAT* in a German municipality. • One member of the *INTEGREAT* project team	January 11, 2016
S_1	Survey	• Survey among 15 refugees in Germany who tested the *INTEGREAT* mobile app	February 2016
W_2	Workshop	• Regional coordinator for refugee initiatives • Member of nonprofit organization that supports disadvantaged people throughout Germany • Two members of the *INTEGREAT* project team	February 12, 2016
W_3	Workshop	• Several members of the government of a German municipality • Several refugees hosted by the municipality • Two members of the *INTEGREAT* project team	September 22, 2016
S_2	Survey	• Feedback survey among information providers with 39 participants	December 2016

Table 3. Governance strategy “Onboarding” in the first action research cycle.

Mechanisms	Description	Actions taken
Governance structure	Decentralized governance in order to incentivize volunteers and to handle decentralized information structure.	• Direct access for content providers to the content management system (CMS) • Decisions on information and information structure made by information providers
Accessibility & control	Open platform with free access for information providers.	• Intuitive CMS • No dedicated quality control of information
Trust	Build trust in sustainability of the project.	• Partnering with established initiative • Official support of the project by universities
Boundary resources	Resources distributed by team members on an individual basis.	• Individual counseling for information providers

Table 4. Governance strategy “Sustainable Onboarding” in the second action research cycle.

Mechanisms	Description	Actions taken
Governance structure	Elements of a more centralized governance.	• “Corporate identity” but possibility of local stand-alone app • 6+2 structure of content with general content prefilled
Accessibility & control	Introduction of pragmatic input control.	• Structured onboarding process for content providers • Quality check for information
Trust	Strengthen trust in sustainability of the project.	• Foundation of a nonprofit association • Open sourcing of code and content
Boundary resources	Focus of intangible but effective boundary resources.	• Dedicated community manager • Conferences for content providers • Slack as tool for communication in a decentralized project setting • Translation support

Table 5. Platform governance in commercial and nonprofit platform ecosystems.

Mechanisms	Commercial platform ecosystems	Nonprofit platform ecosystems
Governance structure	• Balance centralization against shared pricing	• Balance centralization against chartering and representation
Accessibility & control	• Centralized, formal control • Legitimation by ownership and market power	• Decentralized, informal control (i.e. clan control) • Legitimation by expertise
Trust	• Trust in platform technology and owner • Focus on reliability and continuance	• Trust in platform technology and owner • Trust in complementor community • Focus on shared norms and values
Boundary resources	• Standardized boundary resources • Focus on documentation and tools	• Individual boundary resources • Focus on community management

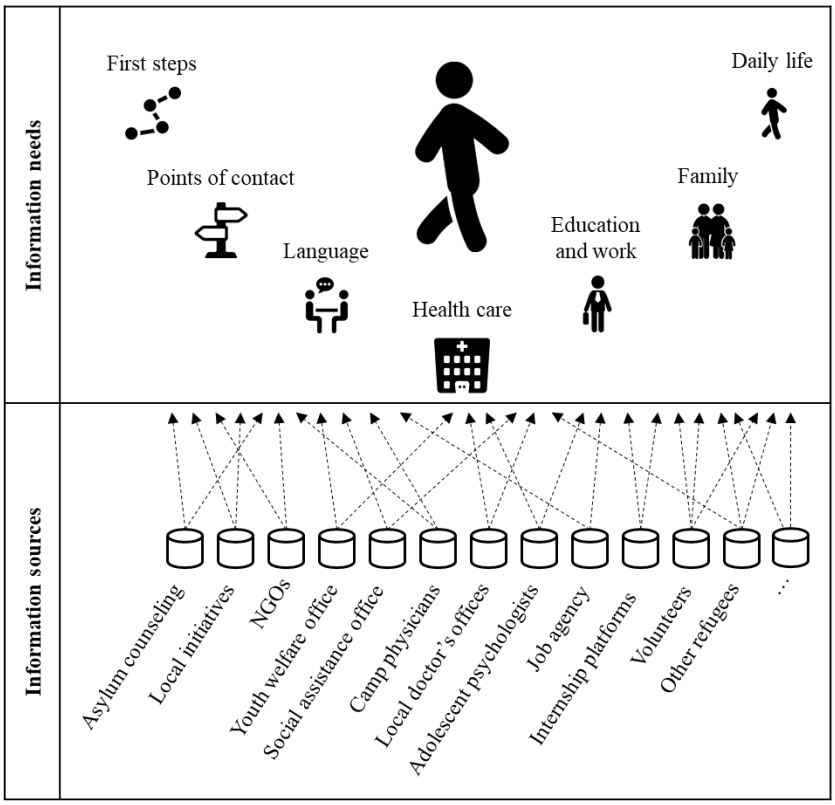

Figure 1. Heterogeneous information ecosystem for refugees.

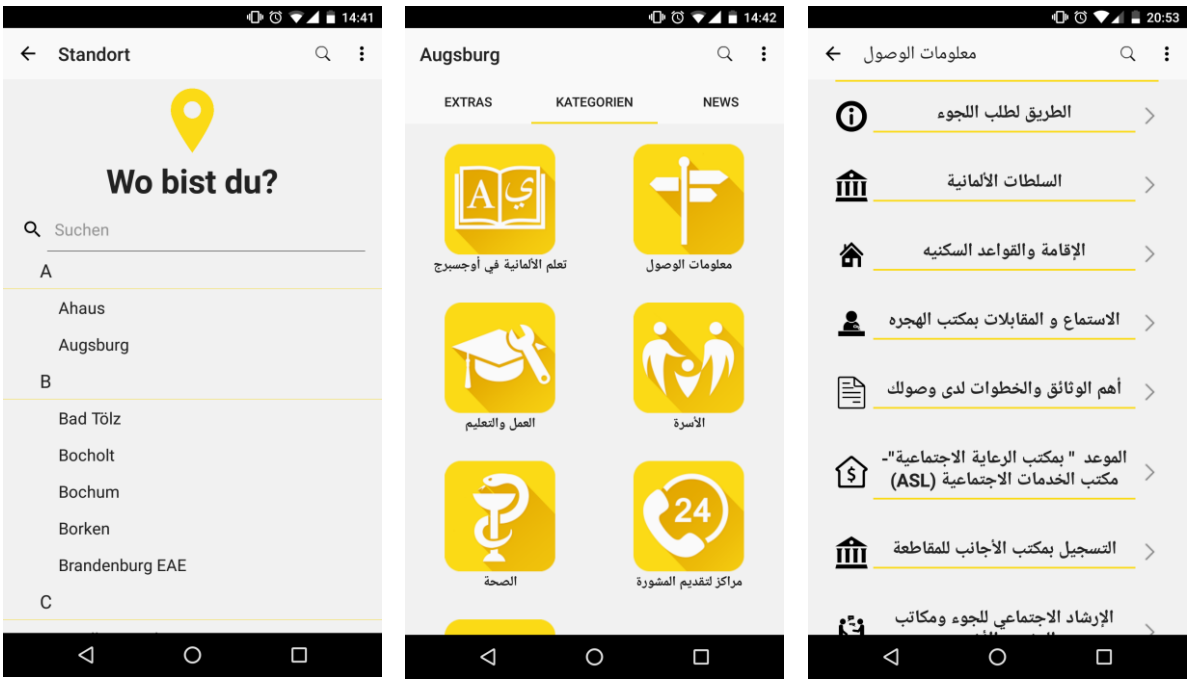

Figure 2: Exemplary screenshots of the INTEGREAT mobile app (from left to right: location selection, main categories, and subcategories; source: Tür an Tür Digital Factory gGmbH, 2017)

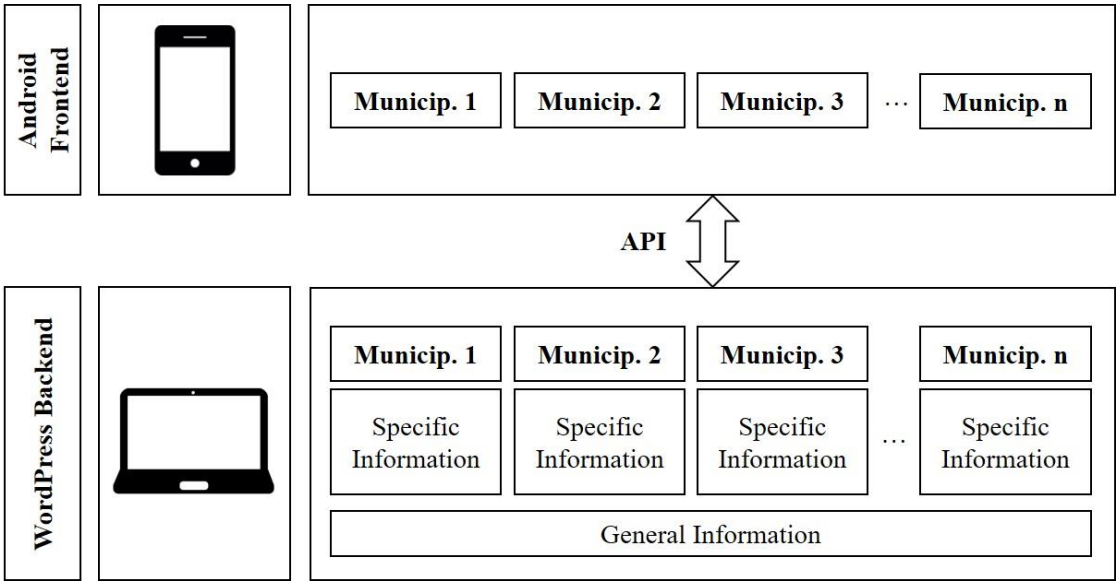

Figure 3. System architecture.

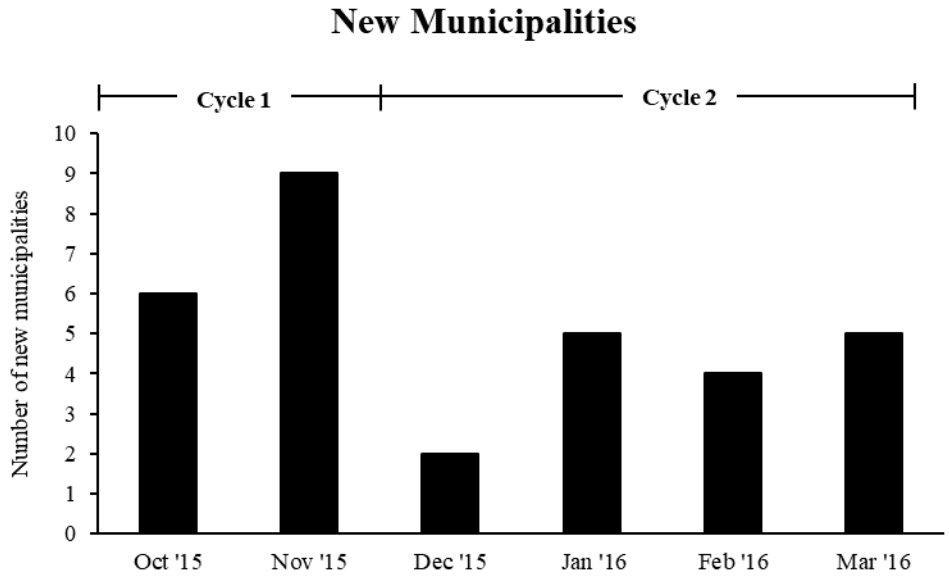

Figure 4. Acquisition of municipalities.

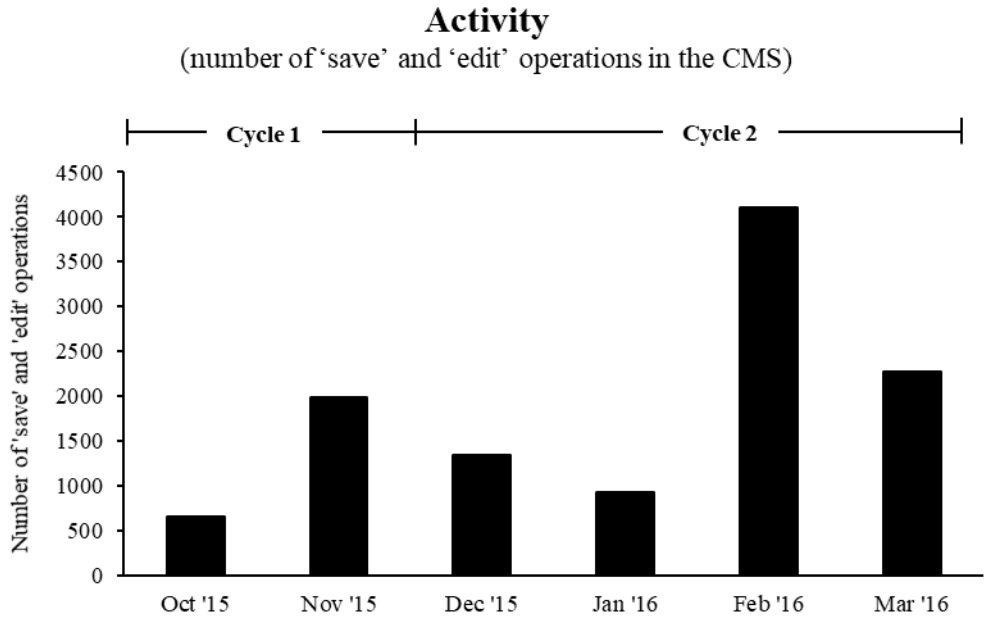

Figure 5. Activity on the platform.