Computer Supported Cooperative Work manuscript No.
(will be inserted by the editor)

Online Idea Management for Civic Engagement: A Study on the Benefits of Integration with Social Networking

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Received: date / Accepted: date

Abstract Idea Management (IM) has increasingly been adopted in the civic domain as a tool to engage the citizenry in processes oriented toward innovating plans, policies, and services. While Idea Management Systems (IMSs), i.e., the software systems that instrument IM, definitely help manage this practice, they require citizens to be committed to a separate virtual space for which they need to register, they must learn how to operate, and they must return to frequently.

This paper presents an approach that integrates IMS with today's most popular digital spaces of participation, the social networking sites, enabling citizens to engage in IM processes using ordinary tools and without having to step outside their daily habits. Our goal is to reach out and pull into IM the large and demographically diverse sectors of the society that are already present and participating in social networking sites. Through a real case study of IM in the public sector that mixed both qualitative and quantitative data collection methods, our proposal demonstrates to be a promising approach to reduce the barriers of participation. We conclude with an analysis of the strengths and limitations of our proposal.

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Keywords Civic Participation · Open Innovation · Idea Management · Social Network

1 Introduction

Citizen organizations and governments worldwide increasingly use technology to engage citizens in deliberation and decision-making processes oriented to innovate urban plans, policies, and public services. Idea Management (IM) is one of the processes used to engage citizens in the innovation of public services or regulations. It refers to the process of collecting, developing, and selecting ideas to develop new, innovative products, services or regulations, or to improve existing ones (Flynn et al, 2003). For example, in Finland the public recently contributed to the reform of the off-road traffic law. The Finns participated online in the lawmaking process by submitting their ideas and by commenting and voting on others' ideas (Aitamurto et al, 2014). Similar initiatives are emerging all around the world (Nambisan and Nambisan, 2013).

IM and citizen engagement is not a recent practice. In the past, organizations opened their innovation processes by soliciting suggestions and ideas from customers, employees, and members through physical "suggestion boxes" located in common areas (Fairbank and Williams, 2001). The emergence of social and collaborative web-based technologies has transformed these mechanisms to collect customer recommendations (e.g., suggestion boxes) into active, sophisticated, and dedicated Idea Management Systems (IMS), which lets people propose ideas, as well as rate and place comments on other users' suggestions (Hrastinski et al, 2010). Examples of popular IMS that support this process are IdeaScale[1], Crowdicity[2], and Spigit[3].

Contributions of participants to provide valuable ideas are seen as strategic assets for the success of IM (Di Gangi and Wasko, 2009). In this sense, the larger the community of participants is, the more diverse are the views that are likely to appear (Hsieh, 2011; Iandoli et al, 2007; Landemore, 2013). Although there is not sufficient evidence of the lack of diversity in online communities, such as IM, there is indeed an ample consensus that cognitive diversity increases the chances of producing valuable outcomes (e.g., ideas) (Bonabeau, 2009; Jeppesen and Lakhani, 2010; Surowiecki, 2004; Terwiesch and Xu, 2008; Frey et al, 2011). Having a set of diverse viewpoints is also seen as important to reduce the risks of extremisms, group-thinking, and intolerance (Sunstein, 2009).

By working disconnected from the physical and virtual places where citizens spend their daily routines, current technologies for civic engagement (e.g., IMS) force the people to be committed to separate spaces and processes and to use tools that are unfamiliar to them (Graeff, 2014). Ideation and discussions hosted in the state-of-the-art IMSs require that citizens sign up and learn how to use a new, dedicated platform as well as return regularly to such platform to participate. Sign-ups and learning are entry barriers that might discourage participation. In this sense, Drenner et al (2008)

[1] `http://ideascale.com`

[2] `http://crowdicity.com`

[3] `http://spigit.com`

have noticed the downside of entry barriers when recruiting new members to groups, demonstrating that entry barriers drive away people that might be interested in contributing to the communities.

We believe that achieving the ambitious goal of increasing participation and diversity requires lowering the barriers of participation imposed by today's civic engagement platforms. We propose to reduce the entry barriers by integrating IMSs with ordinary virtual spaces of participation enabling people to participate in IM using familiar tools and without having to step outside their daily habits. Along with this line, Schiavo et al (2013) have demonstrated that bringing the right technological instrument to where the people actually are is crucial to achieving participation.

In this paper, we introduce and evaluate an approach that integrates an IMS with a social networking site (SNS), with the goal of simplifying the access to civic engagement technologies and facilitating the idea discussion and participation. For the IMS, we specifically consider the case of IdeaScale[4], which has been used, among others, by government agencies, civic organizations, and political parties to harvest ideas from citizens (Saldivar et al, 2016b). As SNS, we use Facebook, today's most popular virtual space of participation[5]. Our approach includes a model to mimic and integrate features of an IMS with standard features of Facebook and a algorithm that synchronizes content between the IMS and Facebook so users can access the same information regardless of the platform they decide to use. Facebook has demonstrated to be a valuable tool to foster dialogue among citizens, serving as a platform for political expression and discussions on public interest issues (Halpern and Gibbs, 2013). Activists have found them useful for advocating changes (Warren et al, 2014) while governments have employed SNSs for engaging the citizenship in online deliberation and planning processes (Evans-Cowley, 2010). By integrating IMS with Facebook, we aim to reduce the participation barrier increasing our chances of ensuring large and potentially cognitive diverse group of participants (Geiger et al, 2011; Wu et al, 2015) and thus useful ideas that can lead to innovations in policies and public services (Lakhani and Jeppesen, 2007; Malone et al, 2010).

Specifically, we aim at answering the following research questions:

- **RQ1.** Does an integration of IMSs with SNSs help to increase the diversity of participants regarding demography (age, gender, district of residence, occupation, level of education), computer skills, and civic commitment with society?
- **RQ2.** Does the integration help to increase the number of participants?
- **RQ3.** Does the integration help to increase contributions (i.e., ideas, comments, votes)?

To do so, we experimented and evaluated an IMS-SNS integration in a real case of IM for civic engagement, and in this paper we report on the methods and results. The remainder of the paper proceeds as follows. A review of related work is presented

[4] `https://ideascale.com`

[5] A recent report from Pew Research Center shows that 80% of online American users have present in Facebook and 76% of them visit the site on their daily basis. For more details about the study, please refer to `http://www.pewinternet.org/2016/11/11/social-media-update-2016`

next. In Section 3, we explain the study conducted to evaluate the approach. Section 4 introduces the approach along with a description of the platforms considered in this study. Later, Section 5 describes the results of the evaluation in the light of the research questions. A general discussion about the effect of the approach and its strengths and limitations is presented in Section 6.

2 Related Work

Various scholars have proposed approached to integrate platforms for eliciting ideas, opinions, and comments in online and offline spaces of civic participation. In this section we discuss related work by first presenting proposals that bring civic engagement tools to physical spaces at the heart of civic life. Then, we review approaches aiming at building spaces of participation by integrating third party platforms with social networking sites.

2.1 Proposals that bring civic engagement tools closer to common physical spaces of participation

There is a large body of work describing efforts towards increasing participation and improving citizen engagement by using public displays placed in selected locations in cities. The primary goal of public displays is to reach communities excluded because of inequalities in the access to technology. For example, Digital Popup (Fredericks et al, 2015) leverages on digital pop-ups (i.e., technologies placed on particular civic spaces to create awareness about a specific issue among people) to foster seamless public consultations by allowing citizens to send their ideas and opinions regarding local issues. The study concludes that digital pop-ups, or technologies situated at specific locations in cities, have the potential of enabling valid responses in regards to local issues by fostering in-situ participation of groups of people that typically do not attend traditional town halls meetings. Along this line, Hosio et al (2015) propose the use of public interactive displays placed at the center of the northern city of Oulu, Finland to collect feedback from citizens regarding urban plans for the city. Using urban screens to let citizens express their views as they walk through public spaces has also been proposed by Schiavo et al (2013). Similar to Fredericks et al (2015), the latter also emphasizes that situated technologies, such as public displays, are useful to provide cost-effective opportunities to engage citizens in urban planning processes. Encouraging wider participation in discussions about social concerns is the goal of Schroeter (2012), who introduces a system that integrates SMS, Twitter, and public screens. In Schroeter's proposal, citizens can use their mobile phones to suggest ideas on how to address issues of public interest; as they approach the display, answers are shown. Schroeter reported that his approach served not only to reach wider audiences that would not otherwise be involved in the discussions but also to enhance the relationship between residences and their local government. The use of mobile phones has been exploited by Graeff (2014) who presents a location-based application that lowers the barriers of participation by creating opportunities of engagement embedded into citizens' everyday life. Users are prompted with questions

about urban planning issues as they pass through geographic areas of the city that are under renovation. Graeff found that location-based approaches have the potential to increase the awareness of citizens regarding their community's problems and needs.

2.2 Approaches that integrate civic engagement tools with social networking sites

Poli (Semaan et al, 2015) is an integrated social network environment of civic and political participation and deliberation. Poli automatically aggregates information from multiple sources (i.e., Facebook, Twitter, and Youtube) and presents in a flexible format that allows users to be exposed and interact with diverse information and discussants. Poli is designed to enhance the experience of people in online political participation by enabling them to successfully address and disseminate information as well as engage in discussions. Semaan and colleagues conclude that Poli could serve to help people in using multiple social media platforms to participate in the public sphere. Han et al (2014) introduces Local News Chatter (LNC), an approach that enriches local news with information posted on Twitter by residents and community media outlets. LNC collects tweets related to locally relevant news articles and displays them within a thread of comments below the text of the articles. Authors of the previous study found that approaches like LNC help to increase awareness of community problems having the potential of strengthening social interaction among residence and facilitating deliberation on local concerns. An integrated platform that combines mobile and web tools with Facebook, called Locast, is presented in Boardman et al (2011), with the goal of extending civic engagement boundaries by fostering social connections and spark conversations about local themes. Locast leverages Facebook technologies to facilitate content sharing and the sign up process. The results of this study unveil that technologies like Locast can facilitate conversations around common interest topics and encourage participation on the young population that feel more attracted and are used to use social media as channel. Through an application that enhanced Facebook with deliberation functionalities (e.g., survey features, polling tools, moderation capabilities), Bendor et al (2012) have examined the suitability of Facebook discussion groups to engage the public in conversations about the innovation of Vancouver's public transportation. Their promising findings of the technical affordance of Facebook as a platform to carry out political discussion provide further support to the idea of using this social media to engage the citizenry already presence in this social media into relevant discussions about public services.

Social sharing features, e.g., share and tweet buttons, have been the preferred approach to integrate IM platforms and social networking sites. Even when these solutions have been proposed to quickly and easily export content of IM discussions into general purpose social networks (e.g., Facebook, Twitter) for creating awareness, gaining visibility, and attracting new participants, recent research has questioned its effectiveness to actually increase participation and productivity in IM (Saldivar et al, 2016b). Alternatively, IdeaScale[6] and Spigit[7] —two of the big players in the field—

[6] Ideascale, Facebook app: `http://ideascale.com/features/facebook`

[7] Spigit, Spigitengage for Facebook: `http://www.spigit.com/products/spigitengage/facebook`

have proposed solutions that extend Facebook's native features proving IM-specific features, e.g., voting mechanisms, filtering, tagging, and searching functionalities.

Although sharing the common goal of lowering participation barrier by bringing civic engagement opportunities closer to social networking sites, our proposal differs from the latter works in three aspects. We do not aim at extending Facebook's capabilities, but at mapping IMS features with the existing functionalities of Facebook so citizens can participate in innovation processes run IMS by using a familiar technology such as Facebook. Additionally, we contribute to state of the art through an approach that not only consumes and aggregates information from social networks but also produces content by mirroring the ideas and comments generated in IMS. Finally, our goal is to facilitate not only registration and content sharing but the actual experience of participation by letting users to follow and actually contribute to IM via features of Facebook.

3 Case Study: Innovation in the Public Sector

In order to answer our research questions asked in the Introduction, we studied the integration between IMS and social networks in the context of a real process of innovation in the public sector, called *Voz y voto* (Voice and vote). Our primary goal was to evaluate whether lowering the participation barrier by introducing a familiar tool, such as Facebook, helps to boost participation and increase diversity in the group of participants. The intuition is that enabling users of Facebook to participate in ideation campaigns with a tool billions of people use regularly, without having to create an own account on IdeaScale and to get familiar with the IdeaScale interface and conventions, it should be possible to attract more people to a campaign and to harvest more and perhaps more diverse ideas and comments – to the benefit of the campaign as a whole.

3.1 Case Profile: *Voz y voto*

Voz y voto is a real scenario of civic engagement for public services innovation that involves local political actors of the party *Patria Querida* ("Dear Homeland" in English) with the power to really push forward citizens' ideas. The party was running to occupy seats in the municipal council of the city of Asunción (Paraguay) and was interested in launching an initiative to involve citizens in the ideation of solutions and innovations for the city's public services.

Prior relationships between some of the authors of this paper and members of the party led to this collaboration – without any political interests or biases on the side of the authors. The selection of the case study represents an opportunistic choice that was driven by the general difficulty of finding campaign organizers (i) that were willing to participate in a study like this, (ii) that still had to start their campaign, and (iii) that were willing to engage in their campaign for a prolonged period of time. Of course, they choice of a political party for a user study may imply an innate bias in the selection of study participants. However, it is important to note that this

study is not interested in any specific population. It is rather interested in the effect that complementing a conventional idea management platform with a social media platform may have on a given population, that is, in which changes and behaviors may be caused. We thus do not expect any major bias of the specific case study chosen on the findings of the paper; we can however not categorically exclude any bias.

The initiative ran for 13 weeks, from October to December 2015. Six themes were chosen by the political party (from here on, the organizer) to guide the discussions, namely garbage and recycling, infrastructure, urban resilience, city markets, sustainable urban mobility, and municipal administration.

The community of IdeaScale `https://vozyvoto.ideascale.com` was employed as the main ideation space (see Figure 3) and the Facebook group Voz y voto[8] as an alternative channel of participation. Since the campaign was from a political party, there is a probable selection bias in terms of campaign participants, which might impact our measures of diversity. Although the platforms were open to anyone and not only to members and followers of the party, this is a limitation, partially mitigated by the fairly broad demographic characteristics (e.g., in terms of age and gender) of the party's supporters. The community in IdeaScale was public, anyone could access the content but people had to register to submit ideas, post comments, or cast votes. In Facebook, the group was publicly accessible to any Facebook user.

Before the initiative began, the authors of this article collaborated in the initiative by setting up the technological tools and advising the organizers on best practices to manage the initiative, i.e., define precisely the goals and discussion topics, participate actively in the discussions by giving feedback, commenting, and thanking for contributions, and ensure that the process leads to concrete actions afterwards (Aitamurto, 2012). During the initiative, the authors provided technical support, took the role of observers (we did not take part on the discussions), surveyed the participants, and reached out to acquaintance, friends, family, colleagues through e-mail to encourage people to participate and spread the word. At the end, we synthesized the ideas and comments and reported the results to the organizer.

Members of the political party participated as moderators in the discussions. They also led the media outreach efforts by advertising the initiative through their personal social media profiles, newspaper articles, and radio shows[9].

3.2 Study Design

The study followed a mixed method approach, i.e., two online surveys (pre and post experience), semi-structured interviews with participants, a log of user activities on IdeaScale, and a database of IdeaScale-Facebook synchronization actions hosted on one of our own machines.

[8] `https://www.facebook.com/groups/1655519178027107`

[9] For example, ABC Color - October 10, 2015 (in spanish) `http://www.abc.com.py/edicion-impresa/politica/pq-crea-web-para-dialogar-con-la-gente-1415741.html`

3.2.1 Procedure

To measure the impact of Facebook on the participation and contribution, we decided to publish the possibility to participate through Facebook not at the launch of the initiative but just at the beginning of the third week. Figure 1 illustrates the procedure followed to conduct the study.

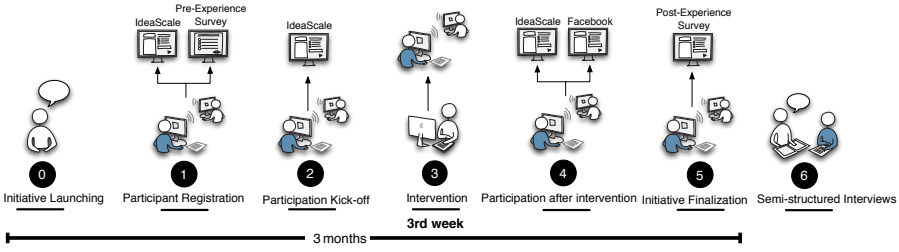


Fig. 1 Study design and phases

The initiative was launched and promoted by the organizer (step 0). The participants were not explicitly recruited, so they learned about the initiative, signed up into IdeaScale and filled in the pre-experience survey (1). After registration, participants started contributing to the process by submitting ideas, posting comments and casting votes on IdeaScale (2) — the participants were given no training or elaborate instructions but only a brief guide on the site of IdeaScale community.

At the beginning of week 3, the intervention stated and participants were notified by e-mail that they could submit ideas, comments, and votes also via Facebook. They were instructed to go to a web page (see Figure 2) providing them with all the necessary information (3). After introducing Facebook, participants took part on the initiative by creating content (ideas, comment, votes) via IdeaScale and Facebook (4). By the end of the initiative, participants were asked to complete the post-experience survey (5) and then follow-up interviews were conducted with 10 of the participants to complement the information collected through the surveys and to deepen our understanding of the experience, strength and limitations of the proposed integration (6).

3.2.2 Measures

We measure diversity (RQ1) by splitting the set of the participants in three groups depending on the platform they used to take part in the initiative, i.e., only IdeaScale, only Facebook, or both platforms. Pearson's Chi-square and ANOVA tests (Lazar et al, 2010) were conducted to check if the groups' profiles vary significantly. Differences were measured in terms of age, gender, district of residence, education, occupation, computer ability, time on the Internet, online and offline civic activity.

Because we were interested in studying whether the introduction of Facebook helps to bring more people on board and more contributions, i.e., more ideas, comments, and votes, we delayed the entrance of Facebook until week 3. Later, we mea-

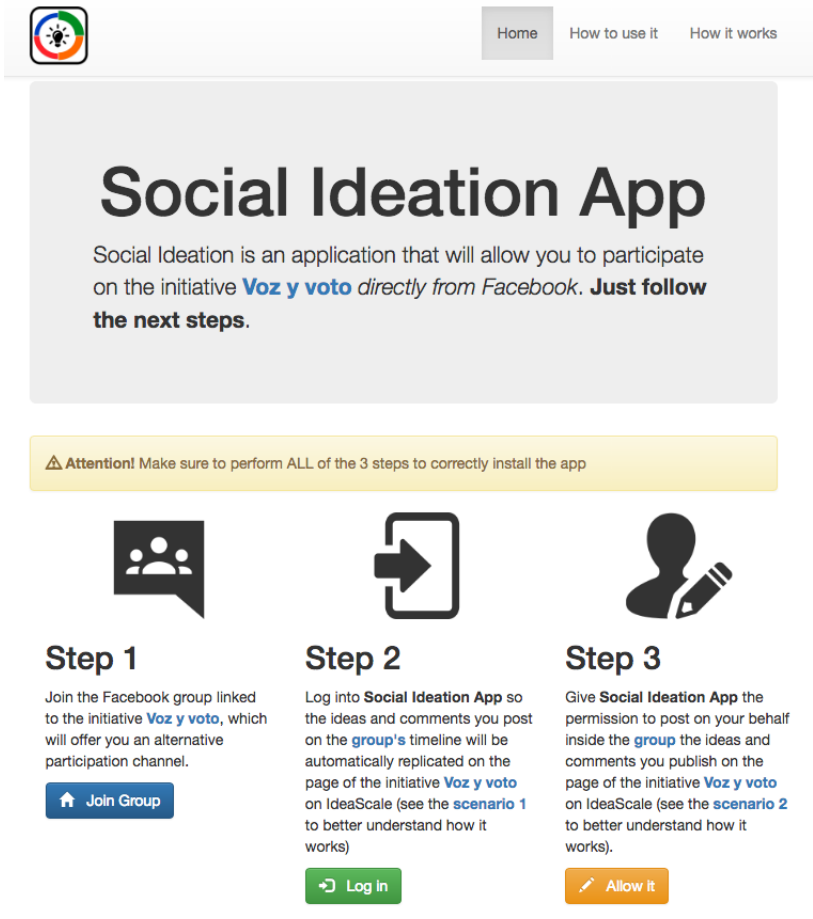


Fig. 2 Website with instructions on how to participate from Facebook. Social Ideation App is the name of the system.

sure RQ2 and RQ3 by analyzing the number of registration, ideas, comments, and votes before and after the intervention.

3.2.3 Online Surveys

As part of the registration form in IdeaScale, they were asked three basic and not mandatory demographic questions, age, gender, and district of residence. With this, we wanted to ensure having the information needed to answer **RQ1**. After the participants signed up into IdeaScale or joined the Facebook group, all of them were invited by e-mail to fill a pre-experience survey. The pre-experience survey contained an introductory part where we explained the goal of the study and guaranteed confidentiality of data. Before starting to fill the survey, participants were asked to provide

the email address they used to register on IdeaScale or on Facebook. The survey had three sets of questions. The first set inquired about the participants' demographic profile, such as age, gender, district of residence, occupation, education. We decided to have demographic questions also in the pre-survey to ensure of having these information in case the person did not signed up on IdeaScale (thus did not complete his/her demographic profile there) and participated only through Facebook. We merged the demographic information of those that have both registered on IdeaScale and filled the pre-survey. In the second part, the participants were asked about their online civic activity, e.g., sign online petitions, express political opinions in social media or forums, write blogs about public-interest issues. Through a 7-point scale, we checked the frequency that the participants perform these activities (1-never, 7-very often). The participants' computer skills and the time they spend on the Internet were also inquired in this part of the survey to complement the information about their online activity. The last set of questions queried about the participants' civic activities in society, like voting in elections, volunteering in NGOs, leading social campaigns, participating in protests. Also here we measured how often they performed these activities through a 7-point scale, (1-never, 7-very often).

At the end of initiative, the 154 participants were invited also via email to complete a post-experience survey with the goal of understanding the strengths and limitations of our proposal. The survey was composed of two parts. The first asked for an overall self-evaluation of the experience through a 7-point scale (1-insufficient, 7-excellent) and the second consisted of a free-text entry where respondents were requested to provide feedback about their experience in general and with the platforms.

3.2.4 Follow-up Interviews

To complement the information collected through the surveys, semi-structured interviews were conducted with 10 participants. To ensure not missing any valuable perspectives, we, first, split the pool of participants according to their level of participation (i.e., contributor or observer) and the platform used (i.e., IdeaScale, Facebook, or both). Then, we assigned the participants to one of the following six groups, *i) IdeaScale contributors*, *ii) IdeaScale observers*, *iii) Facebook contributors*, *iv) Facebook observers*, *v) contributors in both platforms*, and *vi) observers in both platforms*. Later and without seeking for statistical representativeness, two participants were randomly chosen from each of the six groups. We made sure that the final group of interviewees reflects the demographic distribution of the population of participants regarding age, gender, and occupation. The participants were recruited by e-mail and on a voluntary basis (no payment involved). The interviews were structure following a common script. The script contained similar questions to the ones carried out in the surveys, with additional focus on questions about appropriateness of Facebook and IdeaScale's features to post ideas, comments, and votes. Two pilot tests were run with colleagues to obtain feedback about questions and understand the potential length of the sessions. The sessions lasted on average 40 minutes and were recorded in audio.

4 Integrated IM via IdeaScale and Facebook: Approach

The approach we take in this paper towards answering the research questions consists in integrating IdeaScale and Facebook, so that Facebook users can be involved in the campaign, and then study the effects this has on people, processes and results. In the integration, the main conceptual challenge is to understand how to map the typical idea management features of IdeaScale (e.g., asking for ideas, collecting responses, up- and down-voting ideas) onto commonly used Facebook features, such as posting status updates, commenting on posts of friends, or participating in interest groups. From a technical standpoint, the challenge is to understand how to seamlessly synchronize IdeaScale with Facebook so that the users of the former get access to and can comment and vote on the ideas provided by the users of the latter, and viceversa, possibly in (near) realtime. Ideally, both types of users should be enabled to perform the same types of actions via the platform they prefer, ensuring they both participate under the same conditions and have access to the same information.

One important observation is that in our work we do not aim to implement applications or plug-ins that extend Facebook's capabilities nor do we want to develop ad-hoc solutions on top of Facebook. Instead, we identify mappings, techniques and conventions that allow us to replicate IdeaScale features (e.g., commenting an idea) using native Facebook features (e.g., commenting a post). Instead of extending the expressive power of Facebook we thus rather aim to leverage on the innate analogies between the two platforms. Our motivation is to propose an approach that aims to i) reduce the participation barrier, thereby increasing our chances of having a large and possibly diverse group of participants; ii) reach people "where they are" avoiding them the need to leave online spaces they usually inhabit (e.g., Facebook) and to be committed to separate places (e.g., IMS); and iii) allow people to take part in IM by using familiar technologies.

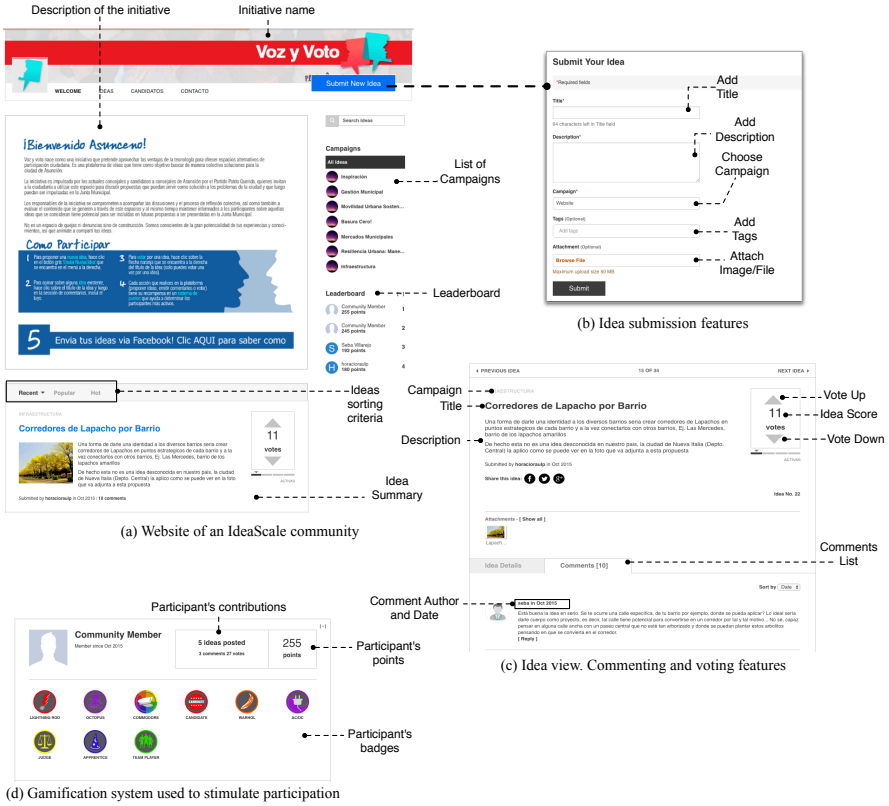
Before presenting the approach to integrate IdeaScale with Facebook, we briefly summarize the key characteristics of the two platforms.

4.1 IdeaScale: Idea Management

With 4 millions of users and more than 500 clients, IdeaScale is one of today's leading Idea Management systems being used by large institutions and companies such as The White House, NASA, Electronic Arts, and Ikea[10]. In IdeaScale, users create ideation initiatives by setting up a community website in which organizers describe the goals of the initiatives and define campaigns through which ideas are collected. To submit an idea, users, previously registered as members of the community, have to provide a title of 64-characters limit, description, and associate a campaign with the idea. Optionally, they can label the idea with tags and attach an image or file to enrich the description.

Members can also comment and assign positive/negative evaluations (votes) to others' ideas and comments. They can also reply to existing comments. These functions enable them to not only set their positions regarding the ideas and comments

[10] `https://www.slideshare.net/IdeaScale/an-introduction-to-ideascale`



(a) Website of an IdeaScale community

(b) Idea submission features

(c) Idea view. Commenting and voting features

(d) Gamification system used to stimulate participation

Fig. 3 (a) Snapshot of an initiative's website; (b) Idea submission features; (c) Detailed view of an idea, commenting and voting functions; (d) Gamification system

but also to help in refining the content of the proposals. The participants gather points through their activities and the points turned into activity badges, which are visible on the platform's leaderboard. Submitting ideas and commenting give more points than voting.

4.2 Facebook: Social Network

Apart from its popularity[11], Facebook comes with a set of features that can be used to mimic some of the functionalities of IdeaScale.

Posts within Facebook represent the primary form of content contribution. They constitute the central unit of participation as textual comments and replies to posts are the primary means of interaction among users. By commenting posts and by re-

[11] Facebook has more than 1 billion active users for the first quarter of 2017 and almost two billion monthly active users for March 2017 `https://zephoria.com/top-15-valuable-facebook-statistics`

sponding to comments participants collaborate with each other providing text-based unstructured feedback on others' contributions.

In contrast to Facebook pages, which are employed by companies for marketing purposes[12], Warren et al (2014) have found that Facebook groups help gather with friends and shared interest people to have domain-specific discussions. They have also been highlighted by Evans-Cowley (2010) as important spaces of communication, sharing, and interaction in the context of civic participation in deliberation and public planning processes.

Facebook users can also give structured and non-verbal feedback through the thumbs-up or like button enclosed into posts, comments, and replies. The "like" button is commonly used to agree with someone else's publication, either comment, reply or personal post.

Users can label their posts with actionable hashtags —clickable words or unspaced phrased preceded by the hash character '#'—. This feature, next to giving context to the post and helping to indicate the audience that the post is part of a larger conversation, facilitates the localization of the content. By clicking on hashtags or by asking the search engine to look for hashtags, people can quickly discover all posts labeled with the interested hashtag and access to the entire conversation.

4.3 Integration Approach: General Overview

A general overview of our integration approach is presented in Figure 4. We propose to integrate IdeaScale and Facebook, which so far work independently, by mapping IdeaScale features with functionalities of Facebook. In taking the decisions about the mappings, we consider the features that we understand are used to carry out similar tasks on Facebook. As the figure indicates, we propose to map communities in IdeaScale, which are the hosts of Idea Management initiatives, to groups. Facebook groups seem to be the most natural feature to represent IdeaScale communities, not only because they have already been employed for civic purposes, but also because they represent the space most commonly taken up by shared interest communities to exchange opinions, discuss ideas, and share experiences (Warren et al, 2014).

In IdeaScale, ideas are associated with campaigns created to organize the collection of ideas. Understanding that Facebook hashtags are commonly used to attach content to existing corpora of information (Lindley, 2013), we consider them promising instruments to let Facebook users indicate the campaigns of their ideas. Users in Facebook employ posts to make their contributions. Since ideas represent the main contributions in the realm of IdeaScale, we propose to map them through posts published inside groups that are associated with IdeaScale communities. The mapping of comments and replies is straightforward since both IdeaScale and Facebook offer identical features.

Mapping IdeaScale votes on Facebook is not as direct, as Facebook does not provide features to assess content negatively. Because we aim to employ only existing Facebook features, it is not possible to map down-votes without touching the platform

[12] `http://on.fb.me/1YX0l42`

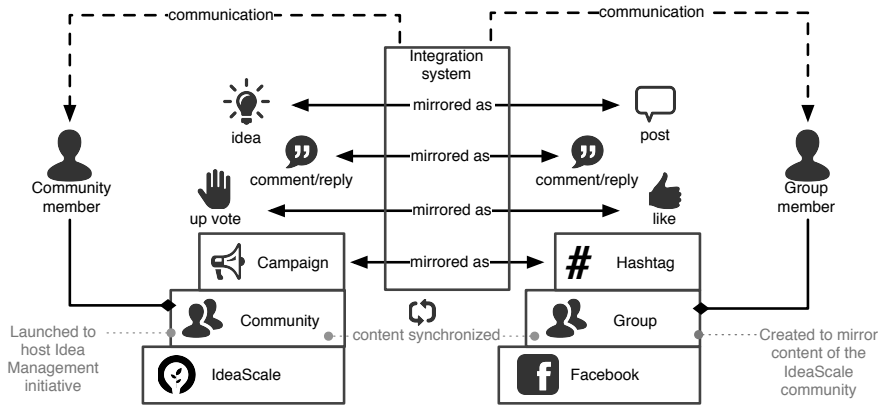


Fig. 4 High-level illustration of the integration proposal.

(at the time this work was conducted, Facebook reactions were not available yet[13]). We thus propose to map only IdeaScale up-votes using Facebook's like feature. Members of IdeaScale communities are mapped to members of Facebook groups. Figure 6 shows the mapping through two illustrative examples and highlights how we replicate content.

The integration system keeps synchronized the content on both platforms by employing this mapping scheme to mirror the content generated on IdeaScale communities on Facebook groups and vice versa. We equip the integration with functions that take care of potential errors in the use of the mapping. In this sense, if a post is created inside the group and does not contain a hashtag or the hashtag is not one of the campaign hashtags, we design the system to automatically place a comment to the post noticing this situation. Because of Facebook privacy policies, we anticipate that Facebook users would need to give write permissions to the system to publish on their behalf. Thus, when a user, who is not already participating from Facebook, put an idea or comment on IdeaScale, the system is designed to send an email communicating the participants to use our integration so that the new content can be visible by the people on Facebook.

4.4 Implementation of the Facebook-IdeaScale Bridge

The integration of Facebook and IdeaScale is achieved by means of a purpose-built integration middleware. This middleware is composed of four modules and interfacing with IdeaScale and Facebook. Figure 5 shows on the sides the platforms IdeaScale and Facebook providing, through Web APIs, services to the middleware. The modules *Social Network Connector* and *Ideation Platform Connector* support the communication logic with the APIs of IdeaScale and Facebook, respectively.

[13] `http://newsroom.fb.com/news/2016/02/reactions-now-available-globally`

The synchronization between platforms is carried out by the *Content Synchronizer*. It also administers a database of records that are used to map elements of IdeaScale (e.g., campaigns, ideas, comments) to features of Facebook. To detect inconsistencies between the platforms, it checks whether the same number of ideas/posts, comments, and replies exists in both the community of IdeaScale and the Facebook group. The module also ensures that mapped instances of ideas, comments, and replies share the same textual information. If inconsistencies are detected, the module fixes them as described later. The features that take care of possible failures in the use of the system and encourage participation from Facebook (see the previous section) are implemented in the content synchronizer module. In this sense, the system automatically places a comment to posts that do not contain a hashtag or the hashtag is not one of the campaign hashtags. Also, the system sends an email to users who are not already participating from Facebook but are posting ideas or comments on IdeaScale.

The system is equipped with a daemon that is in charge of launching synchronization tasks. Periodically (every 5 minutes by default), it requests Social Network Connector and Ideation Platform Connector for the most recent content (e.g., ideas, comments, replies) of a given Facebook group and IdeaScale community. After receiving the information from Social Network Connector and Ideation Platform Connector, it passes the information to Content Synchronizer. At the request of Content Synchronizer, it asks the third party connectors for the creation, modification, or elimination of posts/ideas, comments, replies, and likes/upvotes.

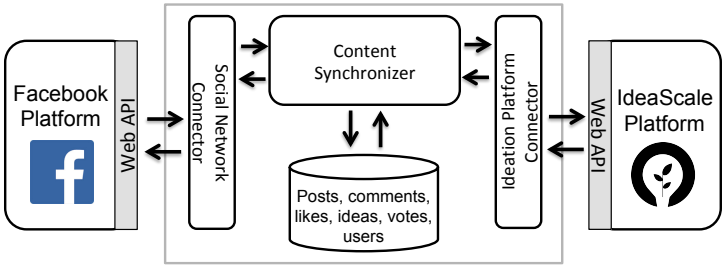
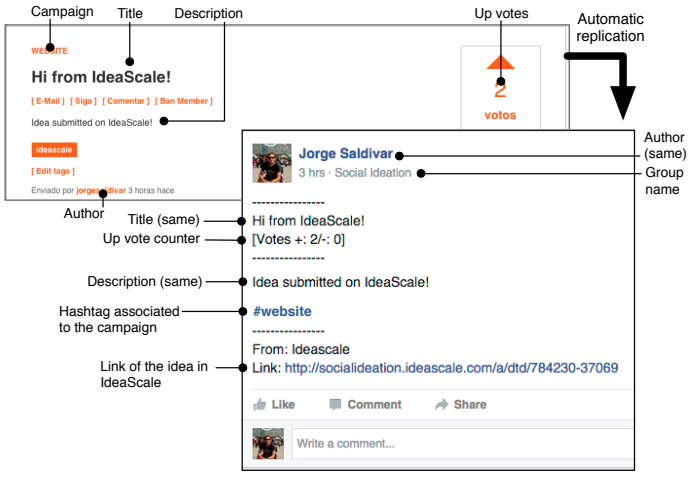
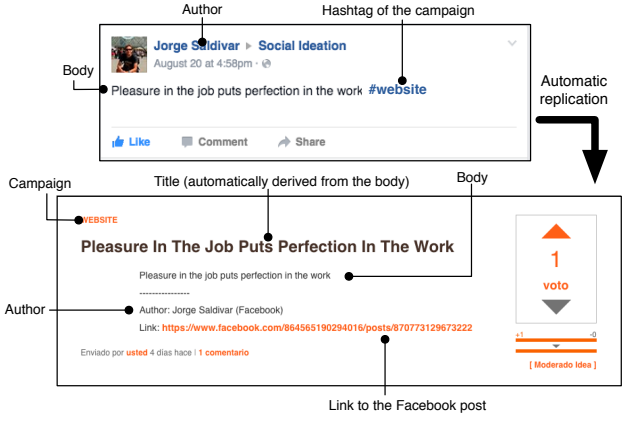


Fig. 5 Architecture of the system

Facebook does not allow third party applications to post on behalf of users unless users give explicit writing permissions. Consequently, ideas, comments, or replies generated inside IdeaScale can be replicated on Facebook if and only if the authors of these content are: i) registered in both Facebook and IdeaScale with the same email address; ii) members of the group associated with the community where these contents were created and; iii) grant permission to our system to write on their behalf inside the group. In the other direction, IdeaScale does not allow to use its API to post on behalf of its users. Thus, we employed a generic author to publish content created on Facebook, acknowledging the original author in the description of ideas or in the text of comments, as shown in Figure 6.



(a) Idea submitted in IdeaScale and replicated in Facebook



(b) Post published in Facebook and replicated in IdeaScale

Fig. 6 Illustrative examples of the mapping in action. (a) Idea submitted in IdeaScale and replicated in Facebook, (b) Post published in Facebook and mirrored in IdeaScale. It is indicated the details of the content that are mapped.

The mapping of votes is more difficult: because in IdeaScale users are allowed to vote on content only once, it is not possible to use a generic user to mirror the likes cast in Facebook as votes in IdeaScale. Therefore, likes cannot be replicated into IdeaScale. In the other direction, mirroring votes as likes can only happen if voters are also members of the Facebook group. Since we cannot assume that every participant in IdeaScale is also a member of the Facebook group (nor a user of Facebook), we do not mirror votes as likes but instead include the number of positive votes in IdeaScale as part of the text of the posts in Facebook.

Last, the APIs of IdeaScale do not support editing functions. It is thus not possible to propagate to IdeaScale modifications in the text of ideas, comments or replies maintained in Facebook. Deleting and publishing items again could be a workaround; however, this would cause the loss of the thread of comments and replies that were posted to the modified content. Even when Facebook offers webhooks that are able to push notification events every time a create, edit, or delete action occurs, IdeaScale does not support this functionality. For consistency in the implementation, we decided to make the middleware operates by polling content on both sides.

Technical Implementation. Our current prototype uses a MySQL database as the repository of content and records and Django[14] as the development framework. The modules are written in Python programming language. The libraries Facebook SDK[15] and IdeaScaly[16] (written by the authors of this paper as part of the implementation work) are used to interact with the APIs of Facebook and IdeaScale, respectively. Celery[17], a Python-based asynchronous task executor, is employed to automatically launch synchronization tasks[18].

5 Results

Next, we present the findings of the participants' profile (**RQ1**). Then, we introduce insights about the participation and contributions in both platforms (**RQ2** and **RQ3**). We close the section by reporting an overall evaluation of the participants' experience.

5.1 Participant Profile: young, wealthy, well educated, technically savvy, mainly Internet content consumers, and infrequent voters

About 92% of IdeaScale participants (99 out of 108) responded to the demographic questions available in the registration form. Out of the 154 total participants, 48% of them filled the pre-experience survey (74 out of 154).

Sex was equally distributed among the participants.The population of the participants was eminently young. About 63% of the participants (77 out of 122) were between 25 and 34 years of age, and 86% (104 of 122) of them were under 45 years of age, as illustrated in Table 1. About 80% of the participants reported living in these districts, which allocate the most expensive neighborhoods (districts 1, 2, and 3)[19]. An interesting finding is the important presence of Paraguayans living abroad. About 8% of the participants (10 out of 122) reported that they lived outside the country, see Table 1.

[14] `https://www.djangoproject.com`

[15] `https://github.com/pythonforfacebook/facebook-sdk`

[16] `https://github.com/joausaga/ideascaly`

[17] `http://www.celeryproject.org`

[18] The source code of the system can be accessed here `https://github.com/joausaga/social-ideation`

[19] El valor por cada metro cuadrado en los distintos barrios de Asunción (in Spanish): `http://www.5dias.com.py/35067-el-valor-por-cada-metro-cuadrado-en-los-distintos-barrios-de-asuncion` Accessed: 05-09-2016

Descriptor	Values	Frequency (%)
Sex (n=122)[1]	Male	60 (49%)
	Female	62 (51%)
Age (n=122)[1]	Less than 18 years old	1 (1%)
	18-24 years old	13 (11%)
	25-34 years old	77 (63%)
	35-44 years old	14 (11%)
	More than 44 years old	17 (18%)
Residence district (n=122)[1]	(1) San Roque	30 (25%)
	(2) La Recoleta	40 (33%)
	(3) Santísima Trinidad	27 (22%)
	(4) Other	15 (12%)
	Abroad	10 (8%)
Level of education (n=74)[2]	High-school	74 (100%)
	Post-graduated	37 (50%)
	College	26 (35%)
	Still in school	11 (15%)
Occupation (n=74)[2]	Full-time employee	33 (45%)
	Entrepreneur	25 (34%)
	Student	9 (12%)
	Part-time employee	4 (5%)
	Unemployed	3 (4%)
Computer ability (n=74)[2]	Advanced	42 (57%)
	Medium	26 (35%)
	Basic	6 (8%)

[1] Data collected through both the registration form of IdeaScale and via the pre-experience survey. 122 represents the number of unique people who provided this information through the registration form and/or the survey. We merged the records of the registered people who also replied the survey.
[2] Data collected only through the pre-experience survey, which was replied by 74 people.

Table 1 Profile of the participants of Voz y voto.

All survey respondents concluded their high-school studies, 35% of them received college-level education, and half mentioned that earned a postgraduate degree (Master, Ph.D., short-term specializations), see Table 1. Almost half of the respondents (45%, 33 out 74) reported being full-time employed. Of the remainder, 34% (25 out of 74) declared to be involved in entrepreneurship activities, see Table 1. The majority of the participants (57%) perceived themselves as technically skilled. Even when the participants reported to be technically skilled, they showed not to be very active in generating civic content online. Through a scale of 1 to 7 (1=never, 7=always), they reported of not commenting in online forums (median=2.5) neither posting in digital newspapers discussion sections (median=2). They expressed that rarely sign online petitions (median=2) and never write blogs (median=1). Sharing personal opinions about political topics on social networks was found to be the most frequent activity, although still below the average 4 (median=3).

The initiative attracted citizens that were not used to cast votes in elections but reported to be involved in other activities in society. About 45% (33 of 74) had not voted in local or national elections within the past five years. Half of the participants (49%, 36 of 74) mentioned that had volunteered in non-for-profit organizations in the last years. Besides, 15% (11 out of 74) expressed that had participated in town halls

and public hearings and 8% (6 out of 74) activated in politics in the past years, as it is shown in Figure 7.

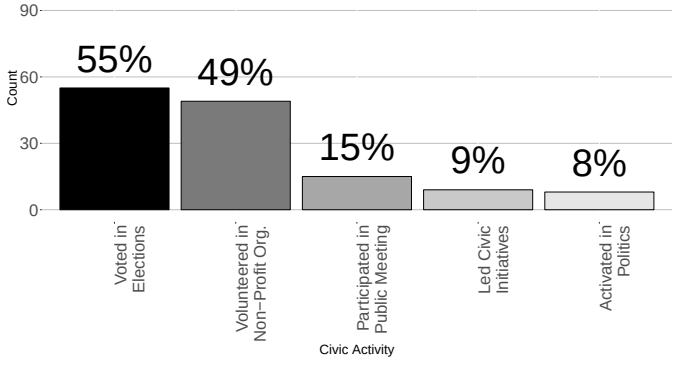


Fig. 7 Participants' civic activity in the last five years (n=74). Data collected through the pre-experience survey.

No evidence of engaging diversity. We used Pearson's Chi-squared tests to analyze difference in the demographic profile among the groups of people that participated i) on IdeaScale, ii) on Facebook, and iii) on both platforms. Differences were measured in terms of age ($n = 122, \chi^2 = 9.47, df = 12, p-value = 0.66$), sex ($n = 122, \chi^2 = 0.15, df = 2, p-value = 0.93$), district of residence ($n = 122, \chi^2 = 7.40, df = 14, p-value = 0.92$), education ($n = 74, \chi^2 = 8.40, df = 10, p-value = 0.59$), occupation ($n = 74, \chi^2 = 11.75, df = 10, p-value = 0.30$), computer ability ($n = 74, \chi^2 = 3.23, df = 4, p-value = 0.52$), and the time on the Internet ($n = 74, \chi^2 = 21.34, df = 12, p-value = 0.05$). In the case of the offline and online civic activity, the pre-experience survey allowed the responders to chose multiple options among 20 alternatives. To facilitate the reading, we decided to report the variation of the χ^2 and $p-value$ instead of the result of each of the 20 analyses. Regarding the offline activities the χ^2 ranged from 0.19 to 14.65 and the $p-value$ from 0.07 to 0.91 while for the online options the χ^2 varied from 8.70 to 14.57 and the $p-value$ from 0.26 to 0.73. We could not find any significant differences at $\alpha = 0.05$, not allowing us to conclude that the inclusion of Facebook brings more diversity to the group of participants.

5.2 Enrollment of new participants

During the 13 weeks of the initiative (from October to December 2015) 154 people participated. Almost half of them (47%, 72 out of 154) took part from IdeaScale, 30% (46) via Facebook, and 23% (36) used both platforms.

By consulting the log files of IdeaScale, we accessed to the date and time of registration activities. From these logs we learned that the vast majority of registrations

in IdeaScale occurred during the first four weeks (91%, 98 out of 108). Similarly, almost all Facebook group entries (93%, 76 out of 82) happened within the first two weeks after we sent the notification email. About 40% (13 out of 36) of the people that participated in both platforms never contributed again via IdeaScale after joined the group; they used Facebook to follow the discussion and take part in it. It appears that Facebook represented a more convenient means than IdeaScale for more than one-third of the participants that tried both platforms. The appropriateness of Facebook to post political opinions and participate in civic discussions was remarked by interviewees PI2 and PI5. They tried both platforms but preferred Facebook because of familiarity and its easy-to-use tools to comment, share and like content.

"Everyone knows how to use it [Facebook] (PI5)"

"It [Facebook] is popular, proper and adequate for political discussions, and almost everyone likes it and is familiar with its functionality (PI2)"

The burst of registrations in both platforms heavily overlaps. It could happen that the group of newcomers helped to spread the word among their Facebook friends, who decided then to sign up into IdeaScale. It is well known the power of social networks, such as Facebook, to spread information (Sun et al, 2009; Bakshy et al, 2012; Halberstam and Knight, 2014). We found, in fact, that one-third of IdeaScale registers happened on the same day we communicated the possibility to participate through Facebook. Additionally, almost a quarter (23%) of the registrations in IdeaScale that happened after the introduction of Facebook were of people that first joined the group and then signed up into IdeaScale. Limitations on the Facebook's privacy policies disallowed us to obtain the friends' list of the group members to further examine their influence in the registrations. However, intuition and data tell us that very likely Facebook helped to boost registrations in IdeaScale. Along this line, interviewees PI4 and PI7 remarked the power of Facebook to easily reach out to large groups of people and to keep the participants updated about progress of initiatives like *Voz y voto*.

Other than the activity logs, we employed the analytics service of Google[20] to track information about visitors of *Voz y voto's* IdeaScale community. We understood that this information could provide additional and complementary input, such as session duration, traffic source, or device used, to answer our research questions. Through the web traffic reports we checked that, in line with our intuition about the Facebook's power to drive traffic to external websites, about 12% of the total traffic to IdeaScale during the three months of the initiative was originated from Facebook.

5.3 Participation and Contribution

The platform IdeaScale registers in log files the activities of the participants. By consulting these logs, we accessed to details about the ideas, comments, and votes created by the participants (e.g., author, creation date time, description, title). In a

[20] https://analytics.google.com

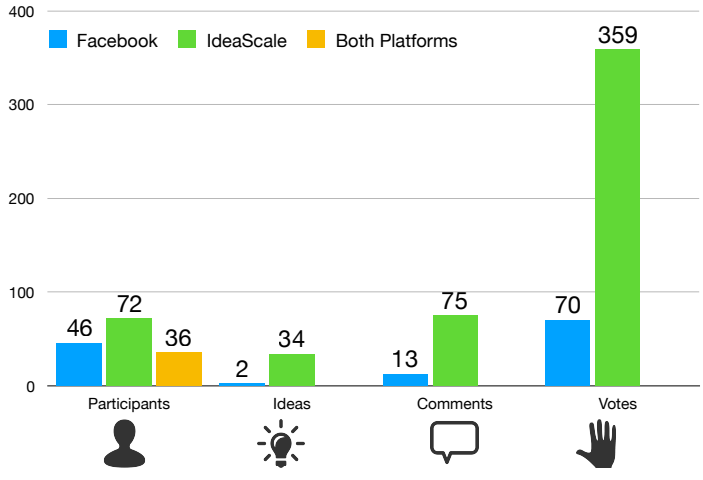


Fig. 8 Participation and contribution in Voz y voto

similar manner, we prepared our system to record the activities that occurred in both platforms.

In total, 36 ideas, 88 comments, and 429 votes (summing up votes in IdeaScale and likes in Facebook) were posted through both platforms (34 ideas, 75 comments, and 359 votes in IdeaScale while 2 ideas, 13 comments, and 70 votes on Facebook). Figure 8 illustrates the distribution of content between platforms. Almost one idea every three participants was produced in general. About three votes were casted by each participant and one comment every two contributors was generated. Ideas gathered in average 2.3 comments (standard dev=2.3) and 10 votes (standard dev=6.5) in IdeaScale. The submission of ideas and comments was mainly perfomed through IdeaScale. Interviewees identified a series of positive aspects about IdeaScale. PI1, PI3, PI4 and PI9 liked its simple, straightforward, and easy to learn features. They also remarked the user-friendliness of the platform to follow discussions and vote on proposals. Also, the gamification system used to persuade participation was highlighted as useful and fun (see Figure 3). Interviewees PI3, PI5 and PI6 identified also some drawbacks regarding the platform. All requested for a more attractive and colorful visual design of the user interface. The same demand was made by one of the survey respondents who told us that he explored IdeaScale but did not find it appealing and decided not to participate. In addition, PI3 recommended to include functionalities that allow the participants to know at a glance the status of the initiative, e.g., trends in ideas, ranking of best/favorite/hot ideas, the percentage of ideas that received comments/votes, etc.

Participation inequality. About half of the participants only observed what happened during the initiative, they did not create ideas, comments, or votes. Through the interviews, we discovered some reasons that may explain this result. PI5 remarked

that not all the public-interest issues were covered within the pre-defined campaigns, requesting the possibility to add additional discussion categories.

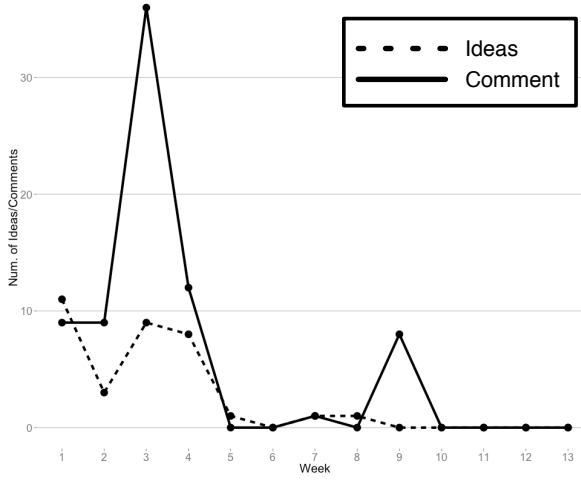
"It was missing, for instance, a category to discuss environment and contamination (PI5)"

PI5 also commented that the description of some campaigns were not informative, so she found it hard to understand the purpose of them. Besides, PI2, PI4, PI7, and PI10 saw some lack of interventions on behalf of the organizer. They remarked that for example, not all ideas received feedback, which might discourage idea authors to keep participating. Organizers providing feedback or responding to ideas could give the participants the impression that their contributions are valuable and motivate them to keep posting (Thiel et al, 2015). Not only most of the participants observed the evolution of the initiative but also the generation of content was dominated by a small fraction of "super-participants," as it is typical in platforms based on user-generated content such as IdeaScale and Facebook (Graham and Wright, 2014; Aitamurto and Landemore, 2015). In fact, 44% of the ideas in IdeaScale (15 out of 34) were submitted by two participants. Similarly, the distribution of comment posting and vote casting follow power-law patterns, i.e., most of the comments and votes were produced by the minority.

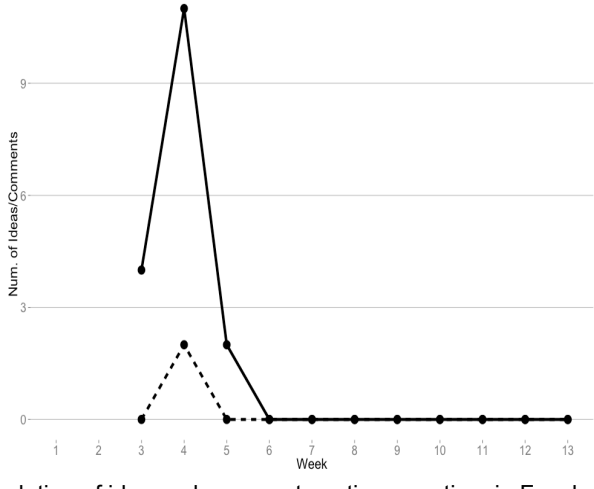
Peaks of activity. The level of the participants' activity changed over time. The first weeks were the most active periods for content creation in both platforms. These peaks indicate localized periods of predominant activity, which could be explained by external events, such as dissemination events that trigger it. Figure 9 demonstrates the presence of peaks in the activity level and how they occurred in both platforms early in the initiative, corresponding with the period of main promotion efforts conducted by the political party's candidates to advertise the initiative through the personal social media profile and via appearances in radio shows and newspapers articles. Saturation in content production was also reported in previous similar experience (Freelon et al, 2012; Saldivar et al, 2016a). In Facebook, the peaks of idea and comment creation overlap and correspond to the period of most group entries, however, in IdeaScale saturation points occurred before the moment of highest registration activity, indicating that a large portion of ideas and comments were produced by the group of early birds, probably the "super-participants." As happened with registrations, after saturation points the activity decreased until reaching of low levels, this might be because as time goes by the most common ideas and opinions were already posted, and the participants avoided replicating the same content.

Anonymous participation. Although most of the participants used their real identity to contribute to the initiative, the disclosure of one's identity was an issue raised by some of them. One of the survey respondents explained that did not take part in the initiative from Facebook because he did not want to be associated with the political party that organizes it and that preferred to contribute from IdeaScale, where he could create a nickname and participated anonymously. Interviewees presented different positions regarding this issue.

"At the expense of loosing quality in the content generated, expressing opinions anonymously can make the people feel more comfortable because their opinions will not be associated with their real identities (PI7)"



(a) Evolution of idea and comment posting over time in IdeaScale



(b) Evolution of idea and comment posting over time in Facebook

Fig. 9 Evolution of idea and comment creation over time

PI4 agreed with PI7 and added that indeed anonymity gives some freedom to express opinions but at the same it favors inadequate behaviors, like insults, aggression, etc. On the other hand, PI2, PI3 and PI4 expressed that they do not have any problem to use their real identity to express opinions in social media. Along this line, PI6 indicated that anonymity may impact negatively on the credibility of the initiative.

Profile and Participation. We found no correlation between the participants' demographic profile (e.g., age, gender, education, occupation, civic and online activity) and their activity on the platforms (e.g., submit ideas, place comments, cast votes).

Impact of Facebook. The Facebook participants took part in the initiative mainly as observers. The low use of Facebook to post ideas could be due to problems of communication. On the one hand, the notification email was not read by the participants, PI1 and PI4 confirmed that they overlooked it. On the other hand, we failed in communicating how to participate from Facebook. We saw participants having difficulties to follow the instructions presented on the website of the system (see Figure 2). Also, we found that participants had problems to post ideas from Facebook. Either they submitted ideas without hashtags, or they tried to contribute by publishing posts outside the group but as personal status on their news feed. The difficulties to understand how the approach worked was corroborated by PI6 who expressed that he/she got confused about the presence of two channels of participation.

Some participants raised a flag about the length of contributions and the suitability of Facebook to digest long texts. PI2 warned that in Facebook participants should be precise and concise when expressing themselves because long texts are usually ignored there. Along this line, PI3 mentioned that did not participate through Facebook because found hard to digest the long text of the ideas with her smartphone. She suggested, instead, using Twitter because it would force the participants to be more concise when expressing ideas.

5.4 Participants' evaluation of the experience

In general, the respondents evaluated the experience as positive. In a 7-point scale (1 = insufficient, 7 = excellent), the experience received a median score of 5 (mean = 5.08, sd = 1.49). Through a t-test analysis (Lazar et al, 2010), we found the average score significantly larger than the mean 4 of the scale ($t(28) = 5.59$, $p - value < 0.01$).

Supportive and encouraging feedback was received through the free-text entry of the post-experience survey. The participants expressed their concern about the future of the ideas. They really hoped the organizers would be committed to the initiative and take actions to push the ideas further *"voice and vote is a good starting point, hope [the organizers] follow up the viable proposals," "excellent initiative, hope the ideas become real"* (they completed the survey before the recycling plan was launched). Previous research reported that citizens want to spend time on discussions that will affect their living situation (Aitamurto et al, 2014). Some of the survey respondents also asked for a second and longer round of the initiative *"the experience was interesting, it may be worthwhile to open second round to discuss and evaluate a filtered set of the most valuable ideas."*

5.5 Follow-up face-to-face interviews

As for the follow-up interviews with selected participants, video calls were conducted in two occasions to interview participants who lived outside Paraguay (Spain and

United States, respectively); with the rest of the interviewees face-to-face encounters were scheduled. Table 2 presents an overview of the participants' profiles. We use the codes PI1 to PI10 to identify the interviewees.

	Demographic			Occupation				Previous engagement			Civic activity in last years			
Interviewee code	Age	Gender	Residence district	Full-time employee	Entrepreneur	College student	Univ. professor	Forum	Maling list	Social media	Voter	Volunteer NGO	Electoral represen.	Political activist
PI1	54	f	4		x		x	x			x	x		
PI2	46	m	abroad	x						x	x		x	x
PI3	23	f	5	x							x	x		
PI4	36	m	3	x							x		x	x
PI5	50	f	2	x						x	x	x		
PI6	21	m	abroad			x					x	x		
PI7	28	m	5	x							x	x	x	
PI8	60	m	3		x						x		x	x
PI9	26	m	4	x							x			
PI10	66	m	2		x		x	x	x		x	x		
Frequency				6	3	1	2	2	1	1	10	6	4	3

Table 2 Overview of the interviewees' profiles. The city of Asunción is divided into six residence districts, abroad means that the person live outside Paraguay

Three of the interviewees were female and seven were male, ranging from 21 to 66 years, see Table 2. The average age was 41 years. Apart from the interviewees who lived abroad, the rest lived in four out of the six districts of Asunción. Six of interviewees were full-time employees while one was still in college (PI6). PI1 and PI10 were architects, university professors and owners of building companies. PI8 was a politician from the party that organized the initiative and also owns a business company. PI5 was working in a government agency. The remaining full-time employees worked for private companies including financial, commercial, design and marketing, and agribusiness ventures.

For most of the interviewees it was their first time using technology to participate in discussions about public-interest issues. All interviewees voted in local and national elections in the last five years, most of them (6 out of 10) volunteered in NGO. PI2, PI4, PI7, and PI8 worked as electoral representatives in elections and some of them were also active in a political party in previous years, as shown in Table 2.

Interviewees generally assessed the initiative positively, highlighting the following positive aspects. PI7 mentioned that the initiative served as a way to keep the citizenship actively engaged in the public life between electoral periods. PI3 expresses that loved the initiative because she had the opportunity to express ideas that were always in her mind but never had the chance neither the space to expose them. Similarly, PI4 mentioned that finally could find a space through which being heard. The best aspect according to PI2, PI6 and PI9 was that the initiative was conducted on the Internet facilitating the participation.

"The Internet gives me the chance to contribute to my country even living abroad (PI2)"

Interviewees made some recommendations for future initiatives. Regarding technology, PI1 mentioned that future initiatives should exploit more the advantages of mobile technologies offering the possibility to contribute through instant messages apps or to enrich the description of the ideas with photos or videos.About the organization of the initiative, PI4 suggested that organizers should think about giving some rewards to motivate contributions. PI9 stressed the necessity to partner political actors who can implement the proposals. Along this line, PI3 recommended promoting the initiative by explicitly stating that contributions will have an impact on the participants' life.

5.6 Ideas proposed and the feedback of the Voz y voto's organizers

As for the actual outcome of the initiative per se, the idea of building bicycle paths across Asuncion was the most popular with a total of 27 votes. Suggestions for better infrastructure (e.g., streets and sidewalks, public spaces, neighborhoods) and proposals for new plans, projects, and policies to improve the urban traffic saturated the discussion. More than half of the ideas (22 out of 34, 65%) targeted these two themes. Also, infrastructure and traffic regulations were also the issues with most unique contributors, 17 and 13 participants, respectively, posted ideas and placed opinions related to these themes —in average 10 people contributed per theme. Clearly, there was a demand for better infrastructure and more efficient traffic. Even when infrastructure and regulations issues concentrate the majority of the suggestions, the two most voted ideas were related to sustainable mobility and garbage recycling efforts. Also the idea to implement a city-wide garbage recycling plan was a proposal that gained widespread attention among the participants. It received 8 comments from 7 different persons when in average the ideas were discussed only by 2 persons.

For the organizers, the most innovative idea was the proposal for promoting processes of participatory budgeting in communities and neighborhoods of the city (the idea received 16 votes and was commented three times). However, they recognized that successfully implementing the idea will be challenging because of the number of political interests that can be affected by the inclusion of the citizens into the decision-making process. Apart from this idea, three other suggestions were selected for further study, namely creating chains of *Lapachos* (a typical Paraguayan tree species) across the city, building bicycle paths, and implementing garbage recycling plan. As the outcome of the initiative, the organizers launched in some neighborhoods of the city a pilot plan of garbage classification and recycling. Thanks to the initiative, citizens of Asuncion had the possibility of impacting directly and through concrete ideas in shaping the future of their city.

6 Discussion

In what follows, we discuss the answers to each of our research questions as informed by the results presented in the previous section. The lessons we learned about the strengths and limitations of our proposal are introduced at the end of the section.

6.1 Findings

RQ1: Limited diversity. People that were attracted by the initiative were equally distributed men and women, mostly young, wealthy, well-educated, technology-savvy, and mainly Internet content consumers, not frequent voters but moderately active in society. The profile is aligned with previous experience in other Latin American countries like Brazil (Spada et al, 2016). It differs, however, from the characteristics of people that took part in initiatives alike but conducted in socially and culturally diverse contexts such as Finland where participation is dominated by senior retired and well-educated males (Aitamurto et al, 2016b). *No evidence was found that the integration with Facebook fostered diversity in the group of participants.* The organizer party, whose followers are known to belong to a high social class, might have strongly influenced the profile of the participants. Also, because the initiative was run within an electoral period, citizens not identifying themselves with the political party runnuning the initative could have preferred not to participate to avoid being identified with the party. In fact, one of the survey responders explained that he did not participate via Facebook because he did not want to be considered by his contacts as a supported of the party that organized the initiative.

RQ2: Increased number of participants. *We found that Facebook helped to attract more people to the initiative.* It seems that the group newcomers spread the world with their friends who at the same time showed up also in IdeaScale and became members of the community of *Voz y voto*. In fact, about 25% of IdeaScale registrations corresponded to people that first joined the Facebook group. Along this line, we saw that an important proportion of the participants that tried both platforms found Facebook more convenient than IdeaScale to contribute and follow the updates of the initiative. One-third of these people did not return to IdeaScale after joining the group on Facebook. This result shows that Facebook is not only an effective channel to enroll new participants, but also that it represents an own, independent channel of participation attracting people that would not participate otherwise. Some of the qualitative results reinforce the potential of Facebook as a tool to increase participation in civic engagement processes. For example, interviewee PI7 perceived the integration with Facebook as an opportunity to reach large groups of people that are already discussing about politics and public-interest issues.

RQ3: Low increase in contributions. *Even if the introduction of Facebook in the middle of the process fostered increments in registrations, we found that it did not significantly increase the number of contributions.* A reason for this might be that when we notified participants about the possibility to take part also via Facebook, the most obvious ideas had already been posted. In addition, communication problems could have discouraged participants to contribute from Facebook. Indeed, interviewees and survey respondents recognized that they failed to notice the email through which the possibility to participate from Facebook was notified (e.g., PI1, PI4). Also, other interviewees expressed that they did not understand how to participate from Facebook (e.g., PI6), despite our explanations. Corrective actions could have been taken in time, if the problem arouse earlier. We could, for example, have used other means of communication (e.g., SMS or WhatsApp) or improved the instructions. Also, the reluctance to disclose one's real identity when giving political

points of view could have influenced this result. The use of real identity to express political opinions on Facebook was a concern raised by some of the participants. In this respect, Facebook applications might be valuable to allow anonymous participation. For instance, action links (e.g., post anonymously)[21] can be added to posts. Whenever the participant clicks on the action link, she can be redirected to an external web form that allows her to write anonymous messages. Later, the application takes the messages and publishes them as anonymous comments to the posts.

Another cause may be related to local technology habits. In Paraguay, most of the social network traffic is generated from smartphones, which according to previous research are not appropriate devices for extended text digestion and composition (Zhang and Adipat, 2005). As stated by Gigler (2015), the selection of a civic technology should be context specific; ICT-enabled citizen engagement initiatives have to be implemented taking careful consideration of the local, social, cultural, political, and economic context of the target population. In contexts like Paraguay, particular attention should thus be paid to designing platforms optimized to work with mobile technologies. Here, addressing usability aspects such as connectivity, small screen size, display resolution, and data entry methods appears to be mandatory. In the design of user interfaces, techniques like responsive design[22] seem to be mandatory to satisfy the demand of either desktop and mobile/tablet users.

Technology as a means to strengthen civic participation. *More than 40% of the people who took part in the process declared that they did not participate in elections in recent years.* This result is consistent with the noticed decline in the engagement of people in traditional democratic processes, like voting which has decreased by an average of 9% since 1970 (Newsom, 2014; Dalton, 2013; Diamond, 2011; Hajnal, 2010; Hay, 2007).

For some political scientists, the layers of representation introduced by our modern democracies have shrunk rather than extended the community that can take part in political decisions making people feel that they have lost the ability to shape the future of subjects that affect their daily lives (Barber, 2003; Knowles, 2001). In fact, Reynolds (2005) reported that there is a general perception of the world's population that governments do not serve people's will but interests of special groups. Response to this perceived deficit in democracy might come from generating opportunities of direct participation at different levels of decision-making processes (Landemore, 2012; Pateman, 2012). With more participation, decision-makers will receive more inputs resulting in more effective, informed, and widely-accepted decisions (Lerner, 2014).

Our findings unveil the potential of technology to engage people who usually do not vote in democracy by enabling new and innovative forms of civic engagement where people participate not only by voting every certain year but by generating knowledge, ideas, and making meaningful contributions in democratic processes. Along with this line, our results also demonstrate the importance of process where people can have a more direct and positive impact on the public goods as comple-

[21] `https://developers.facebook.com/docs/sharing/opengraph/using-actions`

[22] Which One: Responsive Design, Device Experiences, or RESS? `http://www.lukew.com/ff/entry.asp?1509`

mentary participatory mechanisms to stimulate the short term —and potentially the long-term— participation of those who usually do not participate through more traditional democratic methods like voting.

Anonymity and Real identity. *Some of the participants mentioned their concerns about using their real identities to express opinions in political contexts and showed to be in favor of participating anonymously or using pseudonymous instead. On the other hand, other participants indicated not having problems to use their names and warned about inadequate behaviors that normally arise in context of anonymous participation (e.g., insults, aggression).* Different positions can also be found in the literature where apparently there is no an explicit agreement on whether anonymity favors or harm participation.

A group of researchers found through a series of experiments and studies that anonymity promotes participation for reasons that range from the ease of participation without any previous authentication step to privacy protection to being less visible in communities where relatives, colleagues, and friends are also participating (Hille and Bakker, 2014; Kilner and Hoadley, 2005; Andrews, 2002; Hummel and Lechner, 2002). On the contrary, Chan et al (2004) and McLure-Wasko and Teigland (2002) concluded that supporting users' identification encourage participation in online communities primary because identity disclosure gives people the possibility to gain recognition and enhance their reputation among peers. Previous research found that anonymity has positive effects on the nature of interactions that arise in online communities. According to Sproull and Kiesler (1986), it makes people feel less inhibited for self-expression favoring freer, sincere, and open conversations (Kang et al, 2013; Bernstein et al, 2011; Papacharissi, 2004). Moreover, Kang et al (2013) concluded that removing anonymity will discourage people from engaging in creative, helpful, and harmless online activities. There is an apparent consensus in the literature that the quality of content and conversations generated in online platforms increases when users are required to self-disclose (Hille and Bakker, 2014; Santana, 2012; Howell, 2007; Kilner and Hoadley, 2005; Millen and Patterson, 2003; Boczkowski, 1999). There is, then, no agreement on the effect of anonymity in promoting participation, there seem to be more conclusive results in regards to the interactions raised by anonymous participation, but there is a general understanding that anonymity impacts negatively in the quality of the content generated in online spaces of participation.

It appears to be a clear need for comparative studies or controlled trials trying to shed light on understanding the impact of anonymity in online participation. Considering the lack of clear agreement in state of the art, the most proper approaches appear to be flexible solutions that give users the option to use an identification or to participate anonymously. Unidentified participation is even more critical in the domain of civic engagement where researchers emphasized the importance of anonymity when posting opinions about public-interest topics (Han et al, 2014). In this sense, our integration provides users the possibility to participate through their Facebook identity, which should favor content of good quality, or they can choose IdeaScale, which its pseudonym feature can make the people feel more comfortable when expressing personal opinions and political views.

6.2 Strengths and weaknesses of the integration

In general, the proposal was positively evaluated by the participants, who highlighted the popularity, familiarity, and easy to use features of Facebook. Along this line, PI2 remarked that Facebook offers several easy-to-use tools to facilitate participation, such as commenting, sharing, and liking. PI4 saw Facebook as promising to keep the participants updated about the news of the process. Interviewee PI5, who tried both IdeaScale and Facebook, mentioned that he found Facebook it easier than IdeaScale: *"everyone knows how to use it"* (PI5). Also, PI5 mentioned that having to learn a new technology would represent a strong barrier to participation, especially for the occasional participants. She continued explaining that, for example, it is very unlikely that someone would register into the new platform and learn how to use it just to cast a vote. No interviewee nor survey respondent complained about the way content was mirrored (e.g., use the first 64-characters of posts as the title of ideas, add vote counter as part of the post text), and no one seemed to miss the features that we could not mimic (e.g., voting).

We also discovered limitations in our proposal. We found that some of the participants had problems following the steps required to participate from Facebook (see Figure 2). We saw participants having difficulties to publish ideas. Some of them posted on their news feed and not inside the group. One of the two participants that posted ideas from Facebook forgot to include the campaign hashtag; he edited the post adding the hashtag after the group moderator noticed the situation. Some interviewees remarked the difficulties to digest long texts in Facebook, highlighting that people should be precise and concise when expressing an idea if they want to be heard. PI3 reported that he found it hard to digest the long text of the ideas posted in the Facebook group. She suggested that Twitter could be more appropriate, because it would force participants to be more concise when expressing ideas and comments. Along this line, PI10 and PI7 also suggested using more restricted text entries to force people to be more concise and facilitate the reading of ideas and comments.

6.3 Limitations of the study and future work

We recognize that most of the results are not particularly surprising however the study raises interesting questions on the actual benefits of integrating Idea Management platforms with general purpose social networks, like Facebook. Apparently, the introduction of Facebook in the middle of the process influenced the increment of IdeaScale registrations. Due to the constraints in Facebook's privacy policies, we could not verify if indeed the group's newcomers motivated their friends to become members of the *Voz y voto* community in IdeaScale. The suitability of Facebook's features to create and publish ideas is partially confirmed; additional studies in which the platform is available for the participants from the very beginning of the study and participants have the possibility to choose the preferred means of participation would help fine-tune our feature mapping conventions. We found that the presence of two channels of participation may generate confusion among the participants, and it was not clear enough whether Facebook was included to complement IdeaScale

or to replace it. Better instructions on the integration of the two platforms may be needed. Finally, while we did not register any increase of diversity in the group of participants, we think more research is needed to test the approach in other contexts, e.g., with initiatives supported by different organizations and focusing on different topics, to be conclusive on this point. There also open design issues, like anonymous participation, that need to be further explored.

As a future work, we plan to test the approach in other processes of innovation in the public sector. As part of a research project on technologies for civic engagement, we are working with the Ministry of Education of Paraguay, with the Municipality of Asuncion, Paraguay, and with a civic organization to conduct experiences of public sector innovation. In the first case, the goal is to invite the citizens to propose ideas on how the Paraguayan education can be improved. Collect feedback and ideas from the citizenry to influence Asuncion's urban development plans is the objective of the city administration while the civic organization seeks to promote a space for the collective construction of policies and laws. The lesson learned from this study will be applied to design better processes for engaging citizens in the future experiences.

We also aim to improve the developed integration prototype in different directions. We plan to adapt it to work on mobile devices, taking particular attention to writing and reading text. We also want to simplify the procedure to start participating from Facebook; otherwise, it can become an entry barrier that drives away potentially valuable participants. We aim to make more visible to the participants when their content is being synchronized. Here, we can implement mechanisms of notification to make participants aware about the state of synchronization. We plan to improve the integration model making it less dependable on hashtags. We can use, for example, Machine Learning techniques to develop tools capable of identifying automatically the topic of the idea. The tool Civic CrowdAnalytics proposed by Aitamurto et al (2016a) represents, for example, a promising starting point. We will also explore mechanisms to detect and extract the most important points of proposals so that only the essential parts of ideas can be replicated on Facebook. Idea Spotter by Convertino et al (2013) demonstrates the feasibility of solutions alike. We will work on approaches to help the participants to be more precise and concise when expressing their ideas. The work by Klein (2011) can serve as a starting point for this.

Acknowledgements The authors thank Sebastián García, Sebastián Villarejo, members of the Partido Patria Querida (Paraguay), and the participants of interviews for their generous collaboration with the study. This research was sponsored by CONACYT, Paraguay through the program PROCIENCIA and resources of the Fund for the Excellence in Education and Research (FEEI by its Spanish acronym). This work was also supported by the project "Evaluation and enhancement of social, economic and emotional wellbeing of older adults" under the agreement no. 14.Z50.310029, Tomsk Polytechnic University.

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