Citizen X: Designing for Holistic Community Engagement

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ABSTRACT

Crowdsourcing in urban environments, geospatial annotation, social curation, and engaging citizens through social media applications and community-aware, place-based computing systems are at the forefront of pervasive urban technologies aimed at improving satisfaction, strengthening communities, and empowering citizens as stakeholders. This paper reports on the user-centered design of a holistic community engagement platform that combines the above aims and uncovers insights from both sides of the citizen-government divide for a people's GIS for enhancing urban livability.

CCS Concepts

• **Human-centered computing~Social media**   • *Human-centered computing~Interface design prototyping*

Keywords

Holistic community engagement; communities and e-governance; technology-mediated social participation; geospatial annotation.

1. INTRODUCTION

As community members and residents of cities and towns, we are constantly reacting to our environment. Sometimes we share these thoughts and feelings with people we know, through face-to-face exchanges or on social media. A variety of civic engagement technologies exist, e.g. *SeeClickFix*, *FixMyStreet*, *Cyclopath*, and *Nextdoor*, enabling: complaints about potholes, illegal parking, or graffiti [9, 13]; online collaborative map editing and route sharing [11]; community members to network with each other and local police [14]; improved government transparency [e.g. 3]; crowdsourcing of affective responses to urban environments [e.g. 10]; and etc. However, these systems have yet to be integrated into a single platform that takes a holistic approach to enhancing urban livability. To feel truly involved in a community and know that our opinions matter we need a better means for achieving dialogue with fellow citizens and decision makers. If that dialogue is perceived as being one-sided, token, unproductive, or overly bureaucratic, the citizen feels frustrated, disempowered, and

undervalued as a stakeholder. The platform should be a virtual community center where people can organize and build the community.

This paper describes a user-centered research study, Citizen X, dedicated to the development of a holistic community engagement platform for uniting citizens and their local representatives in the planning, shaping, and improvement of cities. We envision a platform where social media, crowdsourcing, and affective computing are rooted in the physical world, and where community members can find one another and be heard by their elected officials. We describe interviews and prototype interactions with citizens and municipal servants to understand the needs, preferences, behaviors, and practices associated with improving urban livability, and how technology-mediated social participation (TMSP) technologies might better support a relationship of trust and communication between local government and civic stakeholders. We conclude with five key insights for the design of location-based technology-mediated social participation systems.

2. RELATED WORK AND MOTIVATION

Urban livability is "where common spaces are the centers of social life and the foci of the entire community" [15], determined by the degree of access residents have to participatory policy making to meet their needs [17]. This idea traces back to [8], which argues the value of social capital, civic initiative, and natural surveillance in improving residents' satisfaction. Urban livability has been the focus of research and innovation efforts in HCI, urban computing, architecture and urban planning, and e-governance. Of particular relevance to the current study is the argument for locally appropriated community-aware networking strategies for enhancing communities and overcoming social problems [e.g. 2, 7, 8, 12].

Among the platforms to have emerged in the past decade are a growing number of services that use crowdsourcing, geowikis, citizen sensing, and other location-aware technologies to support infrastructure monitoring and civic issue reporting. Two platforms of this type are *FixMyStreet* (UK) [9] and *SeeClickFix* (US) [13], featuring mobile GIS technologies for reporting and following the status of problems felt in the urban physical environment. Also relevant are: *Cyclopath*, which features online editable map layers for community-oriented route sharing [11]; location-based online social networks that exploit the spatial functions of online social media for promoting hybrid community-based networking environments, e.g. the now defunct *Gowalla* [1]; and services that enable more personal and cultural forms of geographic social production, e.g. the *Livehoods* and *Curated City* projects [5, 6].

Inspired by these projects, we collected user insights and feedback with the objective of exploring how civic issue reporting, route sharing, location-based social networking, and socio-cultural forms of geographic production might be integrated into a single platform. We modeled this environment with a particular mind towards addressing the shortcomings of *SeeClickFix*, which is unsuitable to many styles of governance around the world [16], e.g. where civic participation is regarded with less enthusiasm. We explored alternatives for authentic feedback beyond *SeeClickFix*'s use of canned responses; overcoming issue duplication [4]; member vetting; and more robust community building capabilities, including functions for organizing and gathering the resources to solve problems without the need for government intervention. We further sought insights into the question: are existing service platforms overly practical at the expense of encompassing culture and leisure dimensions that help in community building and crossing boundaries?

3. CONCEPT GENERATION

3.1 Concept Exploration

Synthesizing our interview data (using affinity diagramming techniques) with the literature on ICTs and civic engagement, we identified 10 key concepts relating to civic participation, government feedback, and community building in the design of a holistic community engagement platform. Each design concept was aligned with a persona and expressed in one or more storyboards.

Action: Respondents expressed lack of faith in government to address problems and affirmed their willingness to solve issues with help from fellow citizens. This concept was explored in scenarios in which our personas took responsibility for minor problems.

Community building: Respondents agreed that more could be done to form closer community ties. This concept was explored e.g. through a fictitious community group for addressing the need for public benches.

Culture & leisure: Combining practical concerns with culture and leisure appealed to respondents. We explored this through shared routes (i.e. trails) and advertisement of a pay-what-you-want (PWYW) yoga class.

Data use: Sites such as *SeeClickFix* offer additional levels of services to paid subscribers. We explored this concept in storyboards that depict use of aggregate data and charts by municipal servants and realtors.

Emotion/affect: Crowdsourcing affective responses to space offers potentially robust means for expressing satisfaction or dissatisfaction with the urban environment [10]. This concept was explored through storyboard hints suggesting how the personas' affective responses might appear in the visualization.

Media sharing: Respondents' openness to uniting practical concerns with culture and leisure prompted us to explore this further through the use of shared media files and short videos in persona interactions.

Privacy: Nearly all of the respondents expressed privacy concerns. This concept was explored in various storyboards that looked at privacy with respect to citizen and government users.

Problems & dangers: Respondents expressed a strong desire to report problems in the city if given a means to do easily. Our storyboards depict personas identifying problems and dangers in the physical environment.

Promotion & incentivization: Popular services such as *Reddit* motivated us to consider incentivization, explored in storyboards that examine use and potential misuse of interactions that resemble upvoting.

Trails: Inspired by *Cyclopath*, we explored practical and leisure-oriented motivations for trail creation and sharing.

Table 1. Speed matrix for user enactments, with cells outlined in bold indicating explicit enactments to be undertaken by government end-users.

React	Initiate	Engage	Digest/Reflect
	You capture and geo-tag a photo of an abandoned construction site that is blocking views of the city's waterfront area, adding the comment "*Disgraceful!*"	You study the issue and add the comment "*Thanks for your concern. The City is currently investigating the issue.*"	You receive a weekly report with statistical tables and charts showing that dissatisfaction with the city's waterfront area is up 7% from the previous week.
	You geo-tag and label a set of stairs that may be inaccessible to people with limited mobility.		You receive a weekly report with statistical tables and charts showing an enthusiastic response to the creation of a new pedestrianized zone in the City Center.
Trailblaze	You mark a "historic" walking route through the City Center, and attach an audio file with some local traditional songs.	You follow a walking trail, while playing the associated media file, if any.	You receive notification that you have been upvoted due to the popularity of your "Historic walking trail."
	You mark a "safe" walking route from your neighborhood to the local primary school.		
Organize	You organize and geo-tag a neighborhood buddy system, pairing elderly neighbors with local emergency contacts.	You join the open action group called "Citizens For a Visible Waterfront," for restricting waterfront developments.	
	You announce and geo-tag a Pay What You Want (PWYW) yoga class at a quiet city park.		

3.2 Speed Boarding Process

Speed boarding sessions consisted of 2-hour semi-structured interviews with small groups of 2-3 participants (keeping end-user types, i.e. citizens and local government officials, separate). Participant groups were exposed to the 10 personas and accompanying storyboards. The discussion of each scenario was led by a researcher who encouraged participants to express comments, opinions, and comparisons, while steering the dialogue to elicit user needs. Storyboard discussions were lively and focused on participants' reactions to the scenarios. When appropriate, participants were asked: "Would you do something like that?" and encouraged to elaborate on their responses. The researcher also regularly asked participants for their feedback in identifying positive and negative aspects, what they would find useful in their own lives, and what they would change. Participants were asked to rank each storyboard on a scale of 1-5, with 5 being most appealing.

In the synthesis, we extracted statements recorded during each session and used affinity diagramming to cluster responses into emergent categories. We started with 14 categories and reduced them to three design dimensions: React, Trailblaze, and Organize. These represent the three primary types of interaction with the system. 'React' refers to interaction with the urban landscape. 'Trailblaze' refers to marking and sharing community-oriented routes. 'Organize' refers to mobilizing community members to achieve a goal. We identified an additional set of time-based dimensions that include: 'Initiate', 'Engage', and 'Digest/Reflect' that represent the three possible stages of a system event. 'Initiate' refers to a novel user interaction. 'Engage' refers to a response by another member of the community, whether an ordinary citizen or municipal servant. 'Digest/Reflect' refers to receiving and taking in feedback from the system. We devised a matrix for carrying out speed enactments with the first dimensions (React, Trailblaze, and Organize) aligning on the vertical and the second (Initiate, Engage, Digest/Reflect) on the horizontal axis. Cells contained scenarios capturing the intersection of interaction types with stages of an event.

We developed a paper prototype in the form of a SimCity-style 'game board' GIS (see Figure 1). In our design choices, we sought user feedback on the interplay between citizen needs and the attention paid to these concerns by local government, and how to bridge these two sides through location-specific dialogue. We also sought to represent community building activities and community-oriented route sharing. This was achieved in part through the use of cloud-shaped comment pins and flag-shaped trail marker pins, both of which can feature a photo, music, or video icon, as well as a user image; square-shaped group/event pins; and unadorned pins signifying solidarity with an existing comment, group or event. Green pins denote satisfaction, red pins express dissatisfaction or danger, white pins denote neutral system interactions, and blue pins indicate community building events. We also designed two sets of cards: one with each of the enactments, and another indicating group membership (blue), automatically generated reports (red or green), and upvoting (purple).

4. DESIGN INSIGHTS AND GUIDELINES

Speed dating results were analyzed with the aim of uncovering insights towards a user-centered community engagement platform. A particular focus of our process was achieving a balance between the needs and preferences of users on both sides of the citizen-government equation. Overall we were surprised by the degree to which the two sides, sometimes viewed
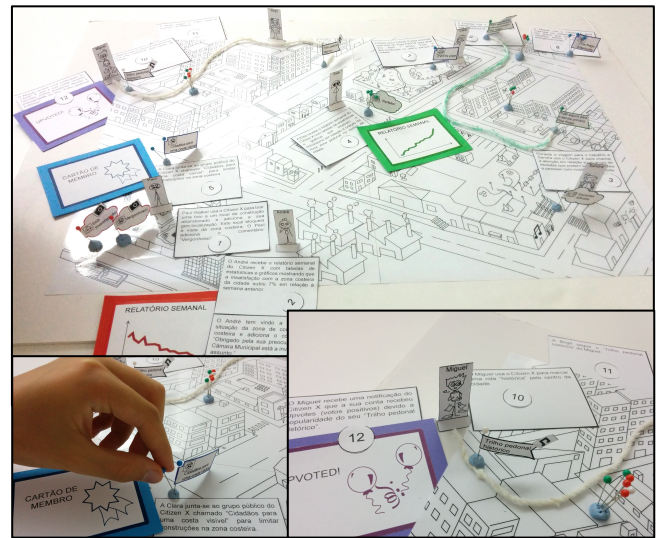

Figure 1. Prototype used in speed enactments.

as antagonistic, in fact shared a similar perspective. Both sides were critical of the status quo and agreed that some form of intervention was necessary. With this in mind, we present five insights and design recommendations to benefit designers of location-based TMSP systems for enhanced urban livability.

Be flexible. Users will always use a platform in ways that suit them best – including new ways that designers will inevitably find surprising. We found that flexibility of use – the ability to use a platform for not only practical but also social and cultural aims – was a priority for ordinary citizens and municipal servants alike. For our users, an efficient means of filing complaints with the municipality was only one in a long wishlist of preferences for a people's GIS. During speed dating our users expressed interest in ideas suggested to them and also came up with an alternative list of ideas. One example of the former was the enthusiastic response given to a scenario involving a female yoga instructor who used the platform to announce drop-in classes at the local park. Creating historical or cultural trails accompanied by an audio guide or songtrack was another idea that received a favorable response.

Prioritize authentic communication. Our users expressed strong views concerning the inadequacy of existing communication channels for addressing citizen complaints. One government participant claimed that a mobile application was in the process of being created to "*assist the feedback process*", but he admitted that at present some citizens expressed discontent at delays and lack of action. The majority of citizen interviewees in our initial fieldwork (68.5%) had never filed a complaint, with a significant majority also expressing a) ignorance about how the complaints process worked, and b) a lack of faith that any action would be taken if they did. These findings point to the need for transparent, authentic communication between citizens and their government. Our feedback tells us that "canned responses" (e.g. *SeeClickFix*) are not a sufficient improvement over the current situation: users want more.

Build trust through member vetting. Trust was a key concern expressed by users, even raising the possibility that a private network solution such as *Nextdoor* might be necessary. Doubts were cast on the safety of trails created by anonymous users, or of "buddy systems" pairing elderly people with local emergency

contacts in the community. Overall, however, even the most cautious municipal servant we interviewed admitted that upvoting and other forms of mutual validation by users would likely be sufficient to establish a workable level of trust in a public network. Member vetting is therefore put forward as an essential element for this type of community engagement platform.

Shared concerns are legitimate concerns. Users on both sides of the citizen-government equation emphasized the importance of "*strength in numbers*" for attracting attention to issues, and agreed that a TMSP system would help citizens gain the critical mass needed to support a cause. Having complaints forgotten was a common concern among citizen participants, many of whom felt that an appropriate government response would be won only by constant pressure and significant citizen support – both elements that could be aided by an effective community engagement platform. On the citizen side, there was enthusiasm for a more efficient means of gathering local support.

Create a direct pathway to engagement. In places where community engagement is conducted through traditional channels of religious and other charitable organizations, responses showed that some people desire direct pathways to engagement. Organizations may have barriers to membership that discourage some citizens, or ideologies or obligations to which not everyone wishes to subscribe. By creating a direct path to engagement, more people in the community may be encouraged to take part in civic life.

5. DISCUSSION AND CONCLUSIONS

This paper highlights the problem of civic engagement and suggests that well designed TMSP systems can improve urban satisfaction by empowering citizens as stakeholders and strengthening ties within communities and between citizens and their local governments. Our study explores the potential for a holistic community engagement platform that goes beyond the limitations of existing service platforms. To understand how pervasive urban technologies might be able to support this holistic approach, we conducted interviews with citizens and municipal servants via speed dating. Data analysis led to five insights for future applications and service designs in the problem space, which include user needs and preferences for: flexibility of use for achieving cultural, leisure, and practical aims; authentic communication; building trust; legitimacy through strength in numbers; and direct pathways to engagement.

It is important to note that this study contributes to a picture of users *outside* the dominant northern sphere, where attitudes to government openness and citizen participation are less established and cannot be presumed. From our vantage point on the margins of Europe, where totalitarianism is for many a living memory, nothing about our insights was obvious from the outset. Seen from this perspective, our design insights and guidelines are surprising in that they describe a desire for radical change from the status quo. We are currently working towards a mobile prototype that enables the user to react to the urban environment, post and respond to geo-tagged sentiments, share routes, and connect with other users on both sides of the citizen-government divide.

6. ACKNOWLEDGMENTS

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