WeDo: End-To-End Computer Supported Collective Action

Haoqi Zhang[1], **Andrés Monroy-Hernández**[2,3], **Aaron Shaw**[1], **Sean A. Munson**[3], **Elizabeth Gerber**[1]
Benjamin Mako Hill[3], **Peter Kinnaird**[4], **Shelly D. Farnham**[2], **Patrick Minder**[5]
[1]Northwestern University, [2]Microsoft Research, [3]University of Washington
[4]Carnegie Mellon University, [5]University of Zurich

Abstract

Many celebrate the Internet's ability to connect individuals and facilitate collective action toward a common goal. While numerous systems have been designed to support particular aspects of collective action, few systems support *participatory, end-to-end collective action* in which a crowd or community identifies opportunities, formulates goals, brainstorms ideas and develops plans, mobilizes, and takes action. To explore the possibilities and barriers in supporting such interactions, we introduce *WeDo*, a system aimed at promoting simple forms of participatory, end-to-end collective action. Pilot deployments of WeDo illustrate that sociotechnical systems can support automated transitions through different phases of end-to-end collective action, but that challenges, such as the elicitation of leadership and the accommodation of existing group norms, remain.

Introduction

Social computing systems play an increasingly important role in collective action—that is, "actions taken by two or more people in pursuit of the same collective good" (Marwell & Oliver 1993). *Computer supported collective action* (CSCA) systems encompass the use and design of social media technology for collective action (Shaw et al. 2014). Successful instances of CSCA connect crowds and communities of participants, lower the cost of communication, facilitate deliberation, and help to coordinate action, thereby enabling new forms of collaboration.

Today, numerous platforms facilitate distinct pieces of CSCA or context-specific collaborations. Examples include *IfWeRanTheWorld*, *Stanford Catalyst*, *Twitter*, *Facebook*, *FixMyStreet*. While some of these systems help connect communities of interest, others enable identification what actions should be taken, discussion of what issues exist, or coordination of synchronous action (King & Brown 2007; Starbird 2013). In this work, we take inspiration from these systems to design a system to support *participatory* and *end-to-end* collective action, in which a crowd or community comes together to surface opportunities, formulate goals, brainstorm ideas, make plans, and mobilize a critical mass of participants to take action.

Participatory, end-to-end CSCA represents an important opportunity for social computing research for several reasons. First, CSCA that is both participatory and end-to-end may take advantage of collective intelligence and cooperation more effectively than systems that are top-down or hierarchically organized (Benkler 2006; Woolley et al. 2010). By involving participants in the entire process, we can explore opportunities for effective mobilization in the pursuit of important, but perhaps unanticipated, individual, social, and organizational goals. Second, ideas that emerge from a participatory process collect support along the way, which may increase the likelihood of collective action actually taking place. Finally, a single end-to-end CSCA system avoids the need for switching between tools to accomplish discrete tasks (e.g. voting), which can lead to inefficiency and frustration (González & Mark 2004). End-to-end CSCA systems can better nudge participants to follow through on promising ideas, and conversely, not to push particular courses of action without deliberation.

In this note, we present *WeDo*, a system aimed at promoting simple, participatory, and end-to-end collective action. We created and deployed WeDo as a technology probe (Hutchinson et al. 2003) to help identify possibilities for, and barriers to, building and deploying participatory, end-to-end CSCA systems. Built as a Twitter app with a complementary web interface (see Figure 1), WeDo supports: the creation of high-level "missions;" collecting ideas from a community for accomplishing the mission; browsing and voting on ideas; and following through on actions. The system automates the transition through these stages of collective action, so as to promote progress and follow-through. Results from our pilot deployments highlight opportunities and challenges for designers of end-to-end CSCA systems.

Related Work

Existing systems supporting collective action tend to fall into one or more of the following four categories:

Systems Supporting Few Tasks. Many systems focus exclusively on a few tasks within an individual stage of collective action. For example, *FixMyStreet* allows people to submit reports of issues such as potholes, broken lights, or graffiti (King & Brown 2007). *FixMyStreet* and similar tools support very specific actions (reporting the issue and location) within a very specific stage of collective action (identi-

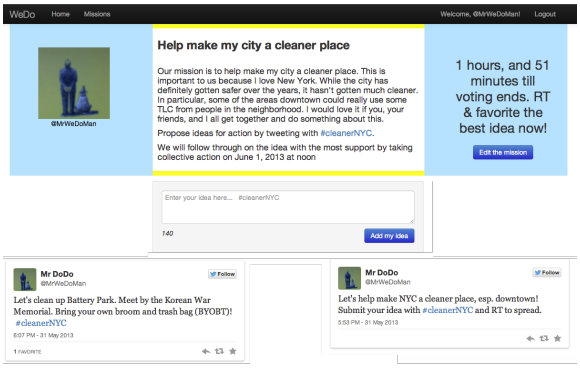

Figure 1: WeDo web interface for viewing and contributing to missions. Users can also contribute directly via Twitter.

fying problems). *FixMyStreet* need not address other stages (such as deliberation), and has not been designed to support other challenges.

Systems Supporting Few Stages. Systems such as *Reddit* promote sharing of ideas, deliberating about their merits, and voting up popular ones, but do not provide support for following through on ideas to taking collective action. Systems such as *Stanford Catalyst* help community members share activities and sign up for activities they wish to participate in, but do not allow users to plan the details of another's suggested activity nor to brainstorm about possible activities collaboratively. In supporting their respective use cases, such systems give up on certain opportunities for collaboration that may help to stimulate collective action on ideas existing and new.

Systems Supporting Action in Few Contexts. Another class of systems support end-to-end CSCA by relying on a narrowly defined context or domain to structure group activities. Consider, for example, *GitHub* and similar tools that combine code repositories, bug trackers, and discussion boards. These tools allow people to surface issues, deliberate solutions, submit resolutions, and adopt them (Schweik & English 2012). However, this end-to-end action is enabled by the constraints of the domain: most issues with software programs can be solved by new code or images; a patch fixes a bug or it does not. Such systems rarely translate well to other contexts or solutions.

Systems Supporting Less Participatory Actions. Finally, there are systems that support less participatory forms of collective action. For example, *Kickstarter* helps people post projects, market their proposal, recruit and engage supporters, and receive funding (or not). Donors provide funds but do not participate in projects directly. Gallop's *IfWeRanTheWorld* breaks down broad goals into specific actions, invites individuals to participate, and motivates them through elements of gamification. Users participate by suggesting and taking actions, but the actions are mostly designed to be carried out by individuals on their own. *Pipeline* (Luther, Fiesler, and Bruckman 2013) helps leaders in online creative collaborations distribute responsibility by assigning tasks to trusted team members, while still leaving the leaders free to choose when and how to move forward. While team members all participate, the projects are not participatory insofar as they are conceptualized, designed, and often executed by

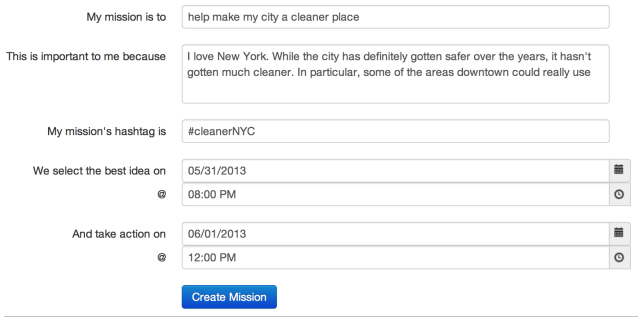

Figure 2: Creating a mission in WeDo

members of a closed, pre-defined group.

These existing systems leave open the question of whether it is possible to create systems that support participatory, end-to-end CSCA without relying on features designed for specific domain- or context-specific constraints. Such systems promise potential enhancements over existing tools by (1) distributing tasks more effectively throughout the process of collective action; (2) facilitating the progression toward eventual action, partly by managing transitions across discrete types of tasks more smoothly; and (3) meeting needs of communities of end users who may benefit from participatory, end-to-end processes of collective action.

The WeDo Prototype

WeDo is a lightweight system for promoting participatory, end-to-end collective action. In the initial design of WeDo, we sought to use the Internet to reduce barriers to action by providing technical support for moving between phases of collective action and automating some elements of the leadership role (Marwell & Oliver 1993). Thus, WeDo supports collective action in four phases: start a "mission," collect ideas, vote on a plan for action, and notify people to coordinate action. The prototype system consists of a web interface for submitting, tracking, and participating in missions, as well as a Twitter bot that automates the distribution of messages for ideation, voting, selection, and action notification (see Figures 1 and 2).

For example, a user could create a mission to cleanup a local park. WeDo announces the mission via posts to the user's Twitter account as well as the WeDo account, soliciting suggestions. After a few hours, the system prompts interested participants to vote on promising ideas by retweeting or favoriting those they like. After the voting deadline, the system sends messages announcing the leading choice and prompting the submission of additional details. Finally, the system reminds participants immediately before the event.

Building on top of Twitter has many advantages. First, in any phase of the process, WeDo allows anyone to discuss ideas and refine plans directly on Twitter. Second, as a messaging system, Twitter makes it easy for people to contribute and to receive notifications anywhere, which facilitates transitioning through phases of collective action. Third, functionalities for expressing support or voting are already built in via retweeting and favoriting. Finally, the social network in Twitter can kickstart missions by leveraging a user's existing followers, conversations, and reputation.

Mission	Who	Ideas	Votes	Top idea votes	Action resulted?	Winning idea	# of people acting
Celebrate end of workshop	Workshop attendees	8	26	9	yes	crowd scream	15
Conference banquet event	Conference attendees	10	18	5	yes	group hug	30
Twitter book club	Book club members	14	29	9	N/A	*Ocean at the End of the Lane*	N/A
Red Cross donations	Twitter followers	0	0	0	no	N/A	N/A

Table 1: Summary of WeDo deployments, participation, and outcomes

To supplement Twitter's affordances, the WeDo prototype also includes a web interface for visualizing ideas and coordinating actions. The interface provides more context for a mission than Twitter and supports more structured interactions. In the current version, a user creates a mission (Figure 2) by filling out a form with fields for the name of the mission, a description prompted by the text, "this mission is important to me because," a hashtag for the mission, a date and time by which the idea is to be selected, and a date and time by which the mission is to be executed. When the form is submitted, the WeDo presents the user with a suggested tweet to start the mission. The user can edit the message but is constrained to the 140 character limit of Twitter. We found this addition was necessary to provide clarity of mission (Marwell & Oliver 1993).

Once the mission is created, interested participants can submit ideas either via Twitter or the WeDo web interface. Automated messages are sent out at their scheduled time. The web interface provides light support for browsing submitted ideas by placing the ideas with the most votes at the top. It also helps users keep track of different stages of the process by grouping messages based on the stages, and showing the amount of time left till the next stage (see Figure 1). Future iterations of the prototype may provide additional support for discussion and planning.

Deployments

We conducted four initial deployments (Table 1). The first two deployments were conducted using a wizard-of-oz version of WeDo that featured only the Twitter interface. Votes were counted manually, and scheduled tweets were sent manually. The latter two deployments were conducted using the current WeDo prototype. With each deployment, we also conducted informal observations of and discussions with system users to learn about their experiences and to inform subsequent iterations.

Wizard of Oz Deployments. We conducted our Wizard-of-Oz deployments at an academic conference. The conference had a few hundred attendees, many of whom had pre-existing friendship ties and familiarity with Twitter. First, attendees of a conference workshop were asked to suggest ideas and decide on a group activity to celebrate the end of the workshop. The entire process of ideation to collective action took about 10-15 minutes. We received a total of 8 ideas, which included taking a silly group photo, laughing, screaming to scare other workshops, paper lightsaber fights, writing code, singing, and drinking beer.

For our second deployment, we created an open-ended mission asking all conference attendees to suggest a group activity for the conference banquet the following day. We used our personal Twitter accounts to spread the word, reply to ideas, and provide examples. We also reached out to highly visible individuals and asked them to participate. We received a total of 11 ideas, which included suggestions such as a flash freeze, a group hug, gambling for charity, and Harlem Shake. Both deployments resulted in collective action, which we recorded via video and shared on YouTube.

Deployments using WeDo. After the initial wizard-of-oz deployments, a book club that "gathers" on Twitter every month to collectively choose a book to read and discuss contacted us about using WeDo to automatically facilitate the process of ideation, voting, and selection. As a test, the facilitator created a mission using his own Twitter account and the group's account (which had more than 90,000 followers). The mission invited people to nominate and vote for the book of the month using WeDo. 30 people contributed to the discussion.

In another deployment, we attempted to create a mission to gather support for the victims of a large tornado. We used one of the authors' account to post the mission, and even recruited a person with more than 18,000 Twitter followers to retweet that first tweet. However, this mission did not take off and no ideas were proposed.

Lessons Learned

Our deployment experiences demonstrate several ways in which WeDo facilitates aspects of end-to-end collective action. First, many users expressed that Twitter made adding ideas easy. They found voting on existing ideas through retweets and favorites intuitive, and liked being able to participate via mobile devices. Second, users mentioned that the system helped to move the process along, steering them toward subsequent action. Third, users appreciated how the system facilitates idea generation and decision-making. They understood that the decision was based on their votes, and that they generated the ideas that are voted on. Finally, even though most missions were open-ended and broad, a number of deployments were successful in that they resulted in participatory, end-to-end collective action.

The WeDo deployments also surfaced many challenges, some specific to WeDo's system design and others more general:

Fluidity and barriers between phases of collective action: While WeDo helped to automatically progress a mission through ideation, voting, selection, and action, barriers still remained at the intersections of these stages. For example, from the conference banquet mission we learned that once an action was planned it was not always clear how it would be "triggered," or whose responsibility it was to do so. To address this issue, future WeDo versions may require a user to agree to serve as a trigger and to identify a triggering action as a prerequisite. As another example, the fluidity between

stages confused some users, especially as the system relied on a single hashtag for many different actions throughout the missions. WeDo's web interface alleviates some of these problems, but users participating directly through Twitter may need additional support.

Confounding user expectations and existing norms: In the book club deployment, users had to adapt to WeDo's process. While they gained the ability to suggest their own ideas and can rely on WeDo to count their votes, they expected other features from the system such as being able to vote on a book suggested by multiple users and having those votes merged (even when retweets were modified). While software improvements can address some of this, human computation may also be necessary to help fill the gaps in data processing and for handling exceptions.

Clarity of high-level mission and task design: WeDo elicits a high-level, abstract mission, and leaves it to users to generate the specific ideas and steps to implement them. The early abstraction decentralizes control over decision-making, but sometimes, as in the "Red Cross" mission, this presented a barrier to entry. Newcomers did not know how to contribute when goals were too broad or vague. The system may need to do more to prompt clear, concrete missions, as well as to help users understand how to make small contributions that help achieve broad goals.

Identifying and mobilizing leadership: In the wizard-of-oz deployments, the authors helped to trigger actions and make sure things moved along. Subsequent deployments drew on existing socio-technical infrastructure to spread the word via existing communities and influential individuals. But without explicit support for identifying and mobilizing leaders, missions can fail to gather the necessary momentum to move forward despite collective interest.

Opportunities for peripheral participation: WeDo supports relatively short-term, lightweight activities, but the design currently assumes active participation throughout different phases of a collective mobilization process. This expectation of follow-up is prohibitive for some users. Participants who wish to join only the voting phases of a project may find it difficult to do so as it is difficult to discover existing missions or identify the current phase of a mission. Future versions can support peripheral participation more effectively by using the interface to make the social process more translucent.

Platform trust and security concerns: The submission process for new missions requires users to give WeDo permission to tweet on his or her behalf. This could prove worrisome for users fearful that a system glitch might spam their followers or choose an inappropriate idea by fraudulent votes. Although the problem is particular to Twitter in this case, questions about how to establish trust and transparency for participants who may not be completely familiar with the tools or procedures involved is a more general issue.

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Conclusion

The design of a system capable of comprehensively supporting participatory, end-to-end collective action across many contexts represents an ambitious, potentially unreachable goal. Our experiences with the WeDo prototype therefore recall the socio-technical gap (Ackerman 2000). Existing tools serve as building blocks which may gradually be assembled into new, more effective and comprehensive systems. In this way, our deployments of the WeDo system highlight potential opportunities for CSCA and provide insights that inform the design of future systems. We intend to pursue follow-up iterations and experimental deployments of the WeDo prototype in order to build on the lessons learned described above.

The domain of collective action presents numerous contexts in which social computing systems are already playing a variety of roles. One contribution of this paper is the elaboration of specific points of contact at which HCI researchers and designers can engage with these systems, and the class of problems they attempt to solve. We hope that others will join these efforts.

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