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# LeadWise: Using Online Bots to Recruit and Guide Expert Volunteers

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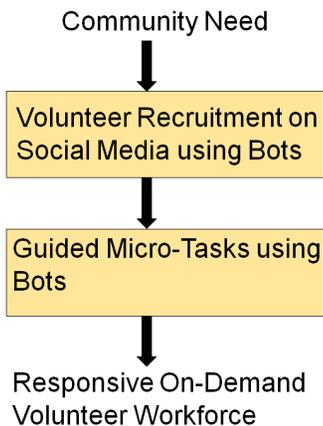
**Abstract**

In order to help non-profits recruit volunteers with specialized knowledge we propose LeadWise, a system that uses social media bots to recruit and guide contributions from experts to assist non-profits in reaching their goals. We test the feasibility of using the system to recruit specialized volunteers for Wikipedia. We focus in particular on experts who can help Wikipedia in its objective of reducing the gender gap by covering more women in its articles. Results from our first pilot show that LeadWise was able to obtain a noteworthy number of expert participants in a two week period with limited requests to targeted specialists.

**Introduction**

Non-profits require volunteer participants to keep functioning [3]. Expert volunteers are in particular highly demanded in knowledge-focused communities like Wikipedia that rely on individual participants with specific subject-matter expertise. However, just recruiting and guiding volunteers can be difficult. In the case of Wikipedia, research shows that although readership has been steadily growing, the number of active contributors started declining in recent years [4]. The difficulty of engaging, and finding tasks for new contributors has been one the main challenges faced by the project [2].

For this study we used the Wikiproject called "Women in



**Figure 1:** Overview of LeadWise: system that uses online bots to recruit an on-demand expert volunteer workforce that executes micro-tasks.

Red", which aims to increase the representation of women on Wikipedia [5]. We designed LeadWise to request only pre-selected micro-tasks from people, as research has shown that pre-selecting tasks can dramatically increase contributions [2]. By providing guidance, LeadWise helps citizens in avoiding the hurdles of finding tasks where they can volunteer; or understanding the whole editing process to know where they can best use their knowledge. Our hypothesis is that via these micro-participations, we will generate a large specialized volunteer workforce that can, in seconds, help the Wikipedia community when needed. We also believe that this type of volunteerism can be extended to other causes and organizations. Figure 1 presents an overview of our system.

### Related Work

Several platforms have tried to design approaches to recruit volunteers [1, 3, 6]. Others have focused on creating workflows that encourage new volunteers to stay. Such platforms generally implement sandboxes where newcomers can make safe contributions, as well as learn from more experienced volunteers about the community [6]. However, the approach requires experienced citizen volunteers to invest a great amount of time providing assistance, which can limit and affect their own contributions.

Other approaches have engaged new citizen crowds with simple lightweight feedback processes [1, 6]. Note, however, that these techniques operate only with the volunteers who have arrived to the platform by themselves. This can limit the type of people who initially decide to take part and influence the amount and type of people who are continuously active in the effort. To leverage more diverse participants, some approaches [9] have gone outside Wikipedia to obtain contributions. There are bots that tweet each time a new Wikipedia article is created to request help expand-

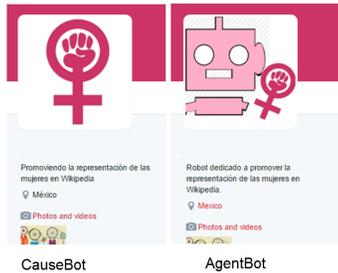
ing it. However, to date a systematic study on the design of these social media bots to recruit and engage participants in Wikipedia does not exist.

However, the bot only targets its Twitter followers and does not offer any guidance, likely limiting the amount and quality of the participation. A different study used bots to recruit volunteers [7]; however, it focused on encouraging participation from the general population instead of experts.

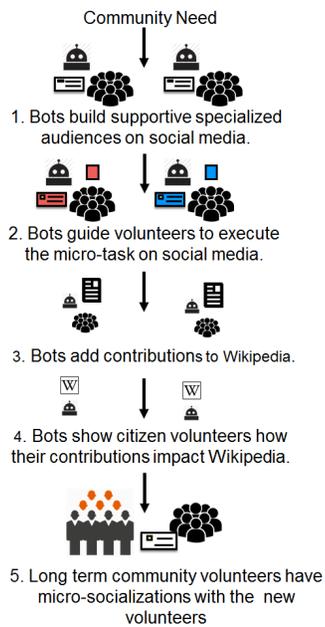
### LeadWise

In order to help recruit expert volunteers for large scale collaborative projects, we present LeadWise, a platform that leverages online bots to convert people's unstructured participation on social media (interactions resembling "slacktivism") into powerful guided labor that helps to achieve a non-profit's goals at scale. LeadWise aims for longer-term quality participation, and thus, in contrast to previous work [7], it focuses on targeting experts with a specific profile instead of the general population. Contrary to previous approaches, LeadWise builds a relationship with the volunteers to better motivate a larger number of contributions. Another important feature is that LeadWise asks its followers to do micro-tasks that can only be done by experts, instead of tasks that any citizen can conduct. We focus in particular on Twitter bots which work with LeadWise to orchestrate specialized volunteer campaigns to support Wikipedia.

**Guided Micro-Participation.** Guided contributions help to efficiently make use of experts without requiring them to understand the community and its needs in detail. We propose using micro-tasks to avoid overwhelming expert volunteer with work. We also considered that people might be more willing to follow the guidance of bots, if they can empathize with the bots. To help people better sympathize



**Figure 2:** Sample profiles of the two types of bot accounts with which we probed LeadWise.



**Figure 3:** LeadWise Process for recruiting volunteers and guiding participation.

with LeadWise’s bots, the system allows users to define the self-presentation of each bot (e.g., profile picture, twitter handle). In this study, we probed LeadWise with bots that presented themselves in two different ways (Figure 2). We created “CauseBots” which are bots that present themselves as a social cause (hiding that the accounts are an automated agent). We also created “AgentBots” which are bots that present themselves as bots supporting a social cause.

Regardless of their self-presentation, the first thing all of LeadWise’s bots do is build a “supportive audience” with experts (i.e., an audience who follows the bot and its tweets, as well as replies, retweets, and favorites the bot’s content). LeadWise focuses on creating supportive audiences, because we assume that it can be easier to obtain participation from supportive audience members than strangers. To achieve this, we followed mainstream techniques such as: adding these individuals to lists, following them, picking favorites among their content and also re-tweeting their content, especially with tweets related to gender equality. Once each of LeadWise’s bots have a supportive audience with over fifteen members, the bots follow the same behavioural rules to request and guide participation: They publicly ask for the names of women who should be added to Wikipedia. People’s contributions are added to Wikipedia and the bot presents volunteers their impact via a tweet with a link to Wikipedia where their suggestions were added. Figure 3 shows LeadWise’s process for recruiting volunteers and guiding participation. Note that bots engage with different Twitter users, without overlap.

## Study

Our goal was to investigate whether a bot system like LeadWise could be used to recruit and guide the contributions of experts in a collective effort.

**Method.** We put into operation two of LeadWise’s bots (each representing a particular type). Both bots were put into operation for two weeks making one tweet each that requested contributions from the public (names of women who should have bios on Wikipedia). Two more tweets were sent by each bot to request for contributions to two random followers. The bots requested contributions at the same time. If a person replied or mentioned the bots, the bots replied with canned responses which asked for more names to add. After the bot got the full name of a woman, she was manually added to Wikipedia to a list of women to cover <sup>1</sup>. After that, the bot sent a tweet with the Wikipedia link and asked the user to verify the information.

**Participants.** We primarily focused on Spanish speaking experts in gender equality. We focused on recruiting external experts in gender equality. We considered that experts were individuals who tweeted heavily about gender equality. Both bots looked for users mentioning related Spanish keywords, such as “equidad de genero,” and who had already published a large number of related tweets (over 50). Note that we took rigorous steps to ensure ethical practices. Participants were informed about the study after the fact and could opt out of participating (in which case we would not use their data.) All participants allowed us to use their data.

**Analysis of Volunteer Responses** For the analysis of responses we wanted to understand the type of expert responses (including retweets, favorites, and mentions in addition to replies) that were triggered. We were particularly interested to see which bot could encourage people to make the most contributions for the micro-task requested. The tweets volunteers made to the bots were checked manually. We read through each tweet and classified it into either on-topic tweet or off-topic tweet based on

<sup>1</sup>[https://en.wikipedia.org/wiki/Wikipedia:WikiProject\\_Women](https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Women)

whether the person contributed specific names of women to add to Wikipedia. We classified 59 tweets as on-topic for CauseBot and 12 for AgentBot. We classified a tweet as on-topic if it responded the question asked by the bot, even giving a name of a woman that needed to have an article in Wikipedia or if the tweet referred to reasons why should be added or what where her main contributions to society and thus needed to be considered. In total, 22 new women were added to the list of Wikipedia articles to cover (19 from CauseBot, only 3 from AgentBot). Table 1 shows a summary of the results. Note that in some cases people contributed multiple tweets to describe why a certain women should be added. The number of new participants we were able to obtain in a two week period employing limited requests from the bots is noteworthy, given that <sup>2</sup> by comparison in over 3 months, only thirty members (i.e., individuals mentioned in the project’s Wikipage) have organically joined<sup>2</sup>.

## Results

	Volunteers	% On-Topic	Contributions	Followers
CauseBot	31	81%	59	304
AgentBot	10	50%	12	75

**Table 1:** Summary of the participation each bot triggered in specialized volunteers.

## Discussion and Future Work

Our experiments show the potential of using bots to obtain volunteer contributions from experts. The majority of the experts who decided to interact with our bots made contributions relevant to the bots’ requests and even started to interact with each other to further drive the collaboration. Our study provides insight into the deployment of platforms that

<sup>2</sup>[https://en.wikipedia.org/wiki/Wikipedia:WikiProject\\_Women/Women\\_in\\_Red/Members](https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Women/Women_in_Red/Members)

use online bots to drive participation from experts. They also demonstrate the feasibility of using bots to help non-profits expand their list of specialized participants. For future work we will study the type of people who responded to LeadWise, and type of contributions made. Additionally, we plan to explore the visualization of contributions of participants to better coordinate the effort [8].

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