The Design State of Crowdsourcing: Applying Online Community Heuristics on Crowdsourcing Platforms

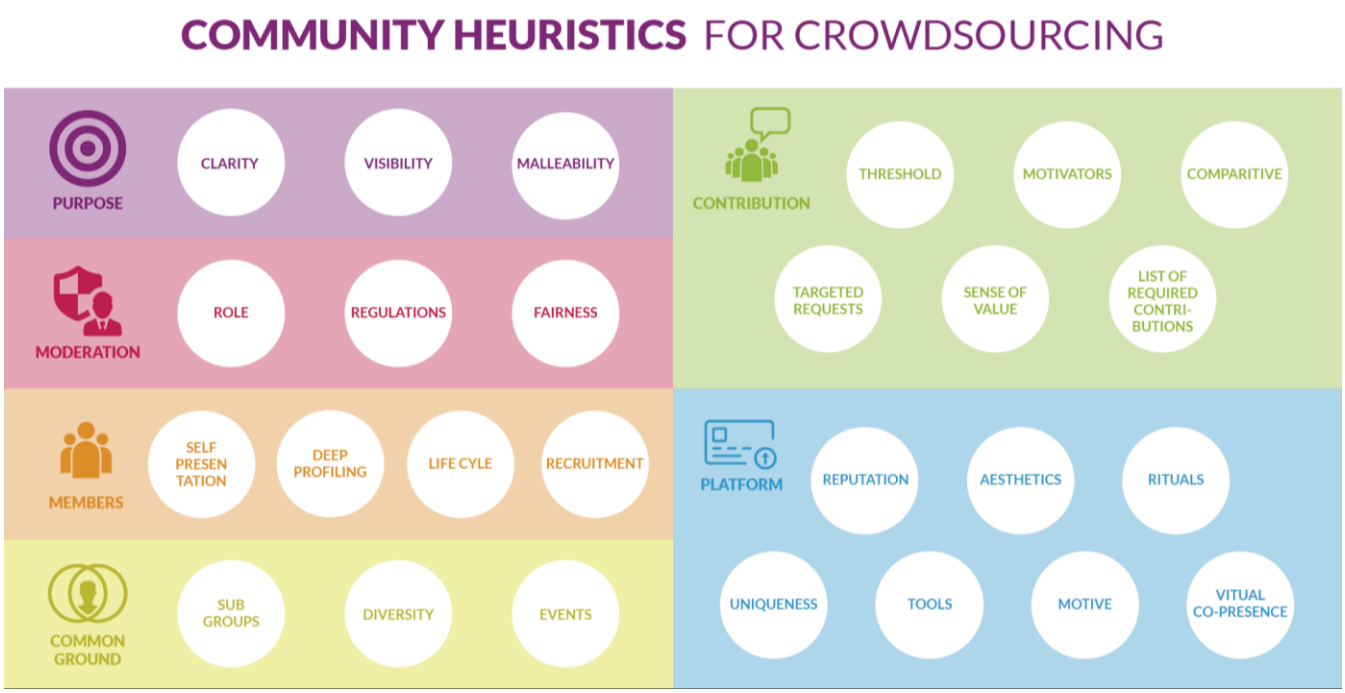

Figure 1. An overview of online community heuristics to evaluate the state of design in crowdsourcing platforms.

ABSTRACT

In this paper, we gather the most relevant design guidelines for online communities and develop heuristics specified for crowdsourcing platforms. We apply the heuristics on 11 different crowdsourcing platforms in order to understand the current design state of crowdsourcing platforms. The paper will highlight examples of how crowdsourcing platforms can improve. Based on the findings of the heuristics, the platforms can move more towards an online community instead of a crowd.

Author Keywords

Crowdsourcing; design methods; community analysis and support, virtual or physical

ACM Classification Keywords

H.5.3 Group and Organization Interfaces: Evaluation/methodology

INTRODUCTION

Any new field needs evaluation tools to further develop. Crowdsourcing is growing in both industry and academia. At the time of writing this paper, Amazon's Mechanical Turk (AMT) has more than 800 thousand tasks available for completion by workers; Upwork, claim to have more than eight million workforce from more than 180 countries that have done $750 million worth of work done; 85% of the largest corporates have already used crowdsourcing in the last ten years [29]; and one crowdsourcing platform alone has lifted more than forty thousand people out of poverty in developing countries (Q1 2016 Impact Scorecard, 2016).

Although these are promising developments, the potential population for both requesters and workers is way larger

than the aforementioned figures. There are currently approximately 3.4 billion people connected to the Internet [23].

Furthermore, there is an ever increasing number of new crowdsourcing platforms [4]. Better-designed platforms are necessary for more people to become part of this new way of working. Moreover, designers of such systems need a systematic way to evaluate their platform against good practices and compare how they are doing against others.

The differences between community and crowds seem to be vague, since monetarily driven crowdsourcing platforms, also profile themselves prominently as a community. After all, what would a crowdsourcing platform be without a vibrant community. Fortunately, there is already substantial literature that presents guidelines for designing and developing successful online communities [7,10,13,17,28]. However, to the best of our knowledge, nobody has tried till now to apply those guidelines to evaluate crowdsourcing platforms.

With this paper we wish to contribute to the literature in the following ways: 1) to gather the most relevant guidelines for the design of online communities; 2) to develop an easy to use format of those guidelines so that they can be utilized by a greater public; 3) to apply those guidelines in new crowdsourcing platforms for bringing into the surface bottlenecks; 4) to evaluate whether existing guidelines need to be extended for covering crowdsourcing platforms. In the following sections we present the literature in which we base our guidelines -which we will name heuristics from now on; the design and online form we developed for the purposes of our research; the preliminary findings for design platforms; the reflection on whether an extension is needed.

RELATED WORK

Crowdsourcing has been used to evaluate for evaluation purposes on a plethora of domains from search systems [3] to graphic perception experiments [11] to privacy filters [16] just to mention a few.

Nevertheless there have been no attempts to the extent of our knowledge to develop tools to evaluate design aspects of crowdsourcing platforms themselves. Some prior research on a more abstract level has been conducted. For example, more participation of the members of a platform can "provide individuals with more chances to get noticed, sharpen their creative skills, and strengthen a sense of community" [35] and that the ideal crowdsourcing platform, should be similar to open-source communities [33]. Heuristics are a well-know and well-accepted method for the purposes of evaluation [24,25].

The heuristics described in this paper follow the same process as the UI usability evaluation (heuristic evaluation), however, the process and description have been modified and re-elaborated with the aims to explore and get results about the existent and applicable principles of communities in the crowdsourcing platforms.

The approach of using heuristic have been applied in other domains such as: ambient displays [21] games [27] and groupware [1], just to name a few. Heuristic evaluation is one of the main inexpensive usability engineering methods and easy to apply compared to other evaluation methods. In crowdsourcing and communities a lot of information cannot be quantified. In this case, a scored evaluation is the solution to get some quantitative data from the analysis of qualitative aspects related with the communities and their offline and online interaction. Nevertheless, heuristics for crowdsourcing purposes haven't yet been proposed neither applied. Thus, we went about reviewing related literature to compile and apply a list of relevant heuristics.

METHODOLOGY

The first version of heuristics was based on two books and two journal articles. First, the book "Building Successful Online Communities" by Robert E. Kraut and Paul Resnick [17] combines five years of research by the research project CommunityLab involving seven professors and myriad graduate students. This academic book makes "design claims" that translate theory to design alternatives that achieve community goals. The second book we utilized is titled "Community Building on the Web" - authored by Amy Jo Kim who has designed many online environments for large corporates in the USA. It is a more practical book organised around "nine timeless design strategies that characterize successful, sustainable communities" [13]. Third, the article "Towards a Design Theory for Online Communities" [10] presents eight design guidelines for online community design, combined with the implementation of the online community "Fieldtrip" as a case study. Last, the article "Designing and evaluating online communities: research speaks to emerging practice" [28], which also shows a combination of usability heuristics as well as Sociability Heuristics for online health communities.

This first version was applied to the crowdsourcing platform Design2Gather, which is a product design competition platform. The reason we chose this platform is due to the fact that we have an on-going collaboration with their design and development team. From applying the heuristics, a qualitative feedback report was written, and discussed in a semi structured interview of one and a half hour with the Creative Director of Design2Gather. We were particularly interested in covering items that we might have overlooked in the initial list of heuristics. Mostly the perspective of the clients of the platform (requesters), was missed. Legal reasons made it hard for the platform to show contributions of active competitions, since their clients would fear that their competitors would infringe copyrights.

Platforms

We realize that there is a plethora of other platforms out there. We did not wish to be exhaustive with this work. We

did wish to cover new platforms with diverse levels of community involvement that label themselves as crowdsourcing or that they adhere to the encompassing definition: "crowdsourcing is an umbrella term for a variety of approaches that harness the potential of large crowds of people by issuing open calls for contribution to particular tasks" (Geiger et al., 2012). We chose this definition because it includes paid crowdsourcing while at the same time does not exclude other computer supported cooperative systems.

Platform	**Description** Evaluator: Evaluator[1] Evaluator[2] Evaluator[3]
99Designs[1]	Graphic design competition marketplace
Mechanical Turk[1]	A marketplace for work that requires human intelligence
Desall[2]	Crowdsourcing the conception and participatory development of new products
Design2 Gather[123]	Product design competition mostly for mass production.
Electrolux Design Lab 2015[2]	Global competition for design and technology students.
Innocentive[2]	Innovation market with solutions to business, social, policy, scientific, or technical problems.
iStockphoto[2]	Crowdsourced content market for photos.
Threadless[1]	Crowdsourcing t-shirt designs, producing the most preferred designs per week based on community votes.
Topcoder[1]	Online computer programming and design competitions.
OpenIDEO[2]	Global community working together to design solutions for the world's biggest challenges.
Quirky[1]	A community company making invention accessible (evaluated while it has been declared bankruptcy).

Scoring and data gathering

The three co-authors were also the evaluators of the platforms. We did all evaluate one platform to establish common ground in terms of our interpretation of the heuristics. To evaluate each platform we created and used a Google form that can be accessed at: http://goo.gl/bDSXfM. Evaluations took between one to three hours depending on the platform's complexity.

To measure the community heuristics, we used a simple scale of scores for each statement: 0 = no, 1 = semi, 2 = yes; [18] In the scoring scale when the evaluator gives a NO score, the heuristic is not present in the platform; the SEMI score means that the heuristic is present but not clear enough, and a YES score is given when the heuristic completely satisfies the heuristic.

DESIGN HEURISTICS

In this section we will shortly describe each heuristic. Heuristics are categorized in two levels. For example the heuristic: "Purpose" has three subcategories: *clarity*, *visibility*, and *malleability*. Each category then has one to three items that adhere to a subcategory. The three items are the ones that appear in the aforementioned Google form which we used for evaluation. To give a concrete and complete example we present the structure of the heuristic "Moderation":

1. Moderation
    - 1.1. Role
        - 1.1.1. Role Q1: Is the influence of the moderators appropriate?
        - 1.1.2. Role Q2: Do the moderators have the correct tools to do so?
    - 1.2. Regulations
        - 1.2.1.Regulations Q1: Are there regulations present on the platform
        - 1.2.2. Regulations Q2: Are the regulations up for debate by members?
        - 1.2.3. Regulations Q3: Are they placed in a appropriate place on the platform?

In total, the survey is composed by 55 questions spread along the heuristics and their levels. With this amount of questions, the evaluator has the capacity to go in depth and explore the details of the Community Heuristics on a certain platform.

We will now proceed to describe in detail all heuristics.

Purpose

The purpose of the platform identifies what changing needs of the members the platform fulfills and should meet the owner's goals.

Clarity: A clear purpose should describe how the platform meets the members and owner's needs. [10,13,28]

Visibility: The purpose should be adequately visible, so newcomers see and understand what needs the platform can fulfill [10,17,28]. "It is important both to orient and entice newcomers to the community as well as to provide a

common frame of reference for more seasoned members." (Gurzuck & Lutters, 2009, p.3)

Malleability: A community will evolve, meaning that the purpose should be able to change along. The owners of the platform have to be able to listen and incorporate feedback of its members and change the purpose when necessary. [10,13,28]

Moderation

The platform needs moderation in the form of fair moderators that have an active role in maintaining and improving the platform. Regulation will help to make the expected behavior clear and can be referred to when violated.

Role: Moderators should be clearly visible on the platform [13], they have an important role and influence in the platform and should have the appropriate tools to do so [17]. The roles that moderators can have consist of activities such as "welcome newcomers, facilitate the core activities, evaluate content, remove people and/or content that violate the community standards, teach members to become leaders, plan and run events, answer questions about the system, evaluate and support leaders and create and maintain the lead program" (Amy Jo Kim, 2000, p.163) [13].

Regulations: Regulation or policies should be available that can be easily found when looked for [17,28]. Member/moderators can refer to them when discussion tend to get out of hand, or when posts are made that don't pursue the purpose of the platform. The regulations should be open for debate in order for further improvement. If the regulation are too visible, it can have a negative influence on newcomers, expecting they are not always followed [17].

Fairness: Moderators can make mistakes, member should be able to contact moderators about their acts and make an appeal if they don't agree with their modifications [17]. Moderators should have a place to share difficult situations, so they can advise from each other and act consistent throughout the platform [13,17,28].

Members

What would a platform be without its members. Members should be able to build up an identity on the platform using a profile. For long lasting communities, the platform should recruit and trigger new members to contribute. The platform should stimulate the current members involvement through increased levels of participation.

Self-presentation: Members need a profile where they can present themselves [7,13,28]. Examples of information that can be displayed on this profiles are: a profile picture, background and topics that they are interested in [10]. When a platform shares privacy sensitive information, like someone's weight loss, it should be possible to create a pseudonym [17]. "*Personalizing features and activities satisfy people's need to develop individual style and create a social statement through the design of their personal community Web space.*" (Gallant, Boone & Heap, 2007).

Deep profiling: The platform should support deep profiling capabilities which it can achieve with: reputation or ranking systems [17], interaction archives and tools that provide an indications of who did what [7]. The platform can provide "a perceived fit between a focal person's belief of his or her identity and the recognition and verification of this identity by other community members" (Ma, 2004, p.5).

Life cycle: The platform should be able to facilitate the membership life cycle [10] described by Amy (p.117 till p.153) consisting of: Welcome its visitors, instruct your novices, reward your regulars, empower your leaders and honor your elders [13].

Recruitment: A community should continuously seek new members[29], not only for it to grow, but also to maintain its existence. The platform should actively recruit new members by external communication and promotion. Seeing which friends already use the platform (by Social Media), will raise the likelihood from them to join the platform as well [17]. Present members should be aware of the importance of newcomers, by inviting member to the platform and by interacting in a friendly and stimulating way [17].

Common ground

The platform should offer mechanisms that support members to find common grounds. On the platforms, members should be able to subdivide from the community in intimate subgroups to accommodate growth and prevent becoming too diverse.

Subgroups: The ability for member to separate themselves from community as a whole, will maintain a sense of intimacy as the community expands [13]. A subgroup will raise the identity-based commitment to the community as a whole, if it is in line with the general purpose of the platform as well as clustering those who are similar to each other into homogeneous groups [17]. The platform should facilitate mechanisms that increase the likelihood that people will encounter the same kind people [13].

Diversity: If the members of the platform, have a too diverse interest in the platform from each other, it can lower the commitment to the platform and drive members away [17]. The platform should be aware of the diversity and when necessary create subgroups. [13,17]

Events: The platform should organize events to reinforce the purpose and values of the community. Events will to define the community, remind members what they have in common and what their community is all about [13].

Contribution

Stimulating members to contribute to the platform, can be one of the toughest tasks of the platforms. The platform

should show what others have contributed, make a certain appeal to the members by a targeted request, and create a sense of value of the member. Important is that the threshold before contribution is adequate and that there are enough motivations for the members to contribute.

List of required contributions: A list of the required contributions should be present, with sorting and tracking mechanisms [17]. The list can be the requests from task givers, that uses the platform to find his crowd and a list about the contributions needed for the development of the platform and community itself.

Sense of value: In the description of the required contribution, it should be clear what impact the fulfillment of the contribution will have; is it complementary or substitute [17]? Emphasizing that a member has a unique position or capability will make people more willing to contribution [17].

Comparative: Members should be able to compare what others have contributed, by this they will learn the normative behavior and are more likely for a more divergent set of contributions [17,33].

Targeted requests: Members should be invited to contribute [10,13,17]. It can be done by targeted requests that match the interest and capabilities of the member [17]. An important role is in making this request, is the status, likeability and familiarity of requester [17].

Threshold: What steps does a visitor has to make, in order to contribute, such as making an account [10]. If this takes too much effort, it is less likely they will contribute, but at the same time, the quality will be higher [17]. A platform needs to find the right balance between being easy to contribute, to extensive steps like providing credit card information or screening before being able to contribute. When a lot of spam or non-relevant contributions are made, the threshold probably should be increased. When nobody is contributing at all, one of the factors can be that the threshold is too high. Members can play an active role in familiarizing the newcomers to the platform and thus lower the threshold [13,17].

Motivations: What kind of motivations does the member have in order to contribute. A distinction is made between intrinsic motivators (effort or performance) and extrinsic motivators (outcomes) [10,17]. “One should be careful about providing rewards and other extrinsic motivators for activities that people find intrinsically interesting, because doing so undermines their intrinsic interest in the task.” (Kraut et al., 2012, p. 58)

Platform

The platform should present itself to its members with and unique position compared to competitors, having good aesthetics, a trustworthy reputation and motive. The platform should offer tools that help fulfill its purpose. The members can create certain rituals over time and their actions should be visible, giving a feeling of a populated space.

Uniqueness: Just like a business, you need to have a unique selling point and compare yourself to competitors. Making it possible to build up a reputation on the platform, will make it less likely for members to go to competitors, since they will not have this reputation there [17].

Reputation: What is the general reputation of the platform in the news, is it supported by certain celebrities or institutions, has it won certain awards as a platform [17]. Showcasing the achievements of the platform, helps to understand the value the platform offers and can raise expectations about future success [17]. Show the growth of the platform, amount of contributions made and the amount of years it is established [10,17].

Aesthetics: A better looking platform, means that people expect it to be better [17]. The members should have a good user experience, and shouldn’t encounter a lot of technical difficulties. [10,28]

Rituals: Incorporating community rituals into the platform will make the members feel at home. Having certain rituals will lay the foundation for a true online culture [13].

Tools: The platform can offer tools that contribute to fulfilling its purpose. Think about collecting, creating, communicating, collaborating etc. It can be the reason that the members will become part of the community and adds to the uniqueness of the platform [17].

Motive: The motive of the creators of the platform has to clear to its members. An “about” page of its initial creators and their motivation of creating the platform will help for members to understand this motive [10].

Virtual co-presence: Finding an empty online community will have little motivation to interact in it [10,19,34]. The platform should give the impression that is a populated space and needs a certain critical mass to do so [29]. This can be done by a list of its (online) members [13], adding time marks to posts and showcasing the latest contributions [17].

RESULTS: APPLYING THE HEURISTICS TO PLATFORMS

The State of Crowdsourcing: Findings Across Platforms

After applying the heuristics in the aforementioned platforms we had a plethora of findings. In this section we will make a selection of the most salient ones.

In most of the crowdsourcing platforms, it was not possible to directly contact moderators. Often the task giver is also the moderator of the page, where members can make contributions.

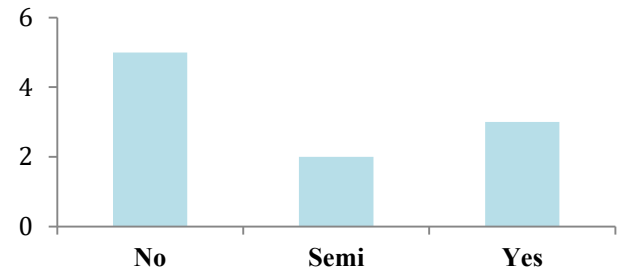

Figure 2: Fairness: Can moderators be contacted by members about their acts? (N=10). There seems to be a difficulty in pointing to a moderator/administrator to address an issue.

We recognize that in some cases such feature might hurt the underlining business model. For example, in 99Designs this is not possible since it would allow designers to make a proposal circumventing the platform and receiving the full amount of reward, instead of giving a certain percentage to the platform. Making an appeal to moderation obviously would not work in this construction.

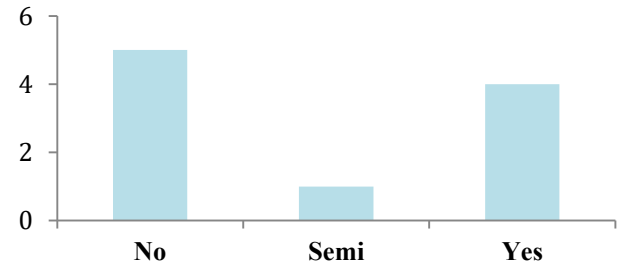

Figure 3: Regulations: Are the regulations up for debate by members? (N=10). Half of the crowdsourcing platforms don't offer a place for members to debate the regulations.

Half of the crowdsourcing platforms, do not offer a place where members can debate the regulations. The closest alternative is to send an email to the platform owners. Thus, currently individual members that make the effort to address certain regulation disagreements, wouldn't get the support or different perspective that they would have received when they could debate the regulations with the owners and other members.

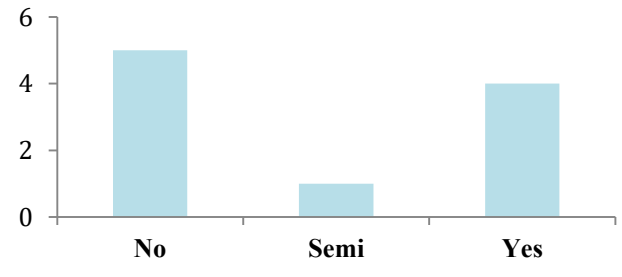

Figure 4: Events: Does the platform organise events that reinforce the purpose of the platform? (N=10). Most of the crowdsourcing platforms, don't organize events.

Some platforms organize actual events that bring together their members. Even though crowdsourcing is accessible from all over the world, people could attend events by live streaming and a chat function like Quirky did in the past to choose the best inventions of that week https://www.youtube.com/watch?v=pjf0fFdpUDI. In only 90 seconds, the community could vote if they thought that the product should be produced, if a minimum 50% of the community supported the project, it would be further developed by the Quirky team. Such events support the community's purpose by frequently bringing the community together –in the case of Quirky every week. Also it gives a face to the owners of the platform. At the end of the invention picking, the owners would answer questions of the community. Quirky showcases a great way how other crowdsourcing platforms could organize events and include their community more.

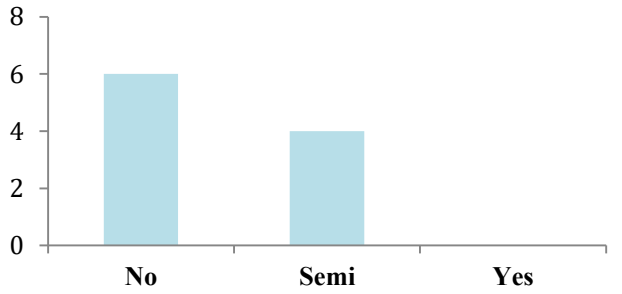

Figure 5: List of required contributions: Is there a list of needed contributions to improve the platform? (N=10). None of the platforms, offer a clear list of required contributions to improve the platform.

The plethora of platforms lacks features of co-creation. In all platforms, a list of required contributions to improve the platform misses. Crowdsourcing platforms underestimate the power of communities in co-creating their own environment. A good example is seen at AMT which has a list of tools made by requesters on the platform that support requesters https://requester.mturk.com/developer/tools. If the platform actively asks for these contributions, those can be implemented and designed faster even developed for free by members of the community.

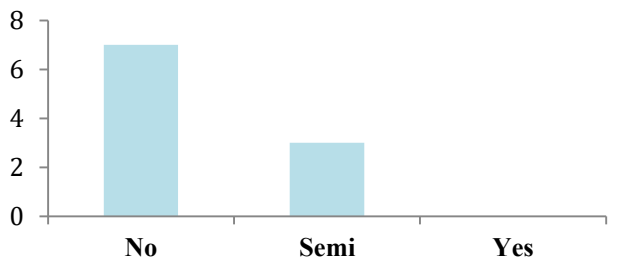

Figure 6: Recruitment: Does the platform recruit new members, by using its existing members? (N=10). None of the platforms stimulate their members to recruit new members to the platform.

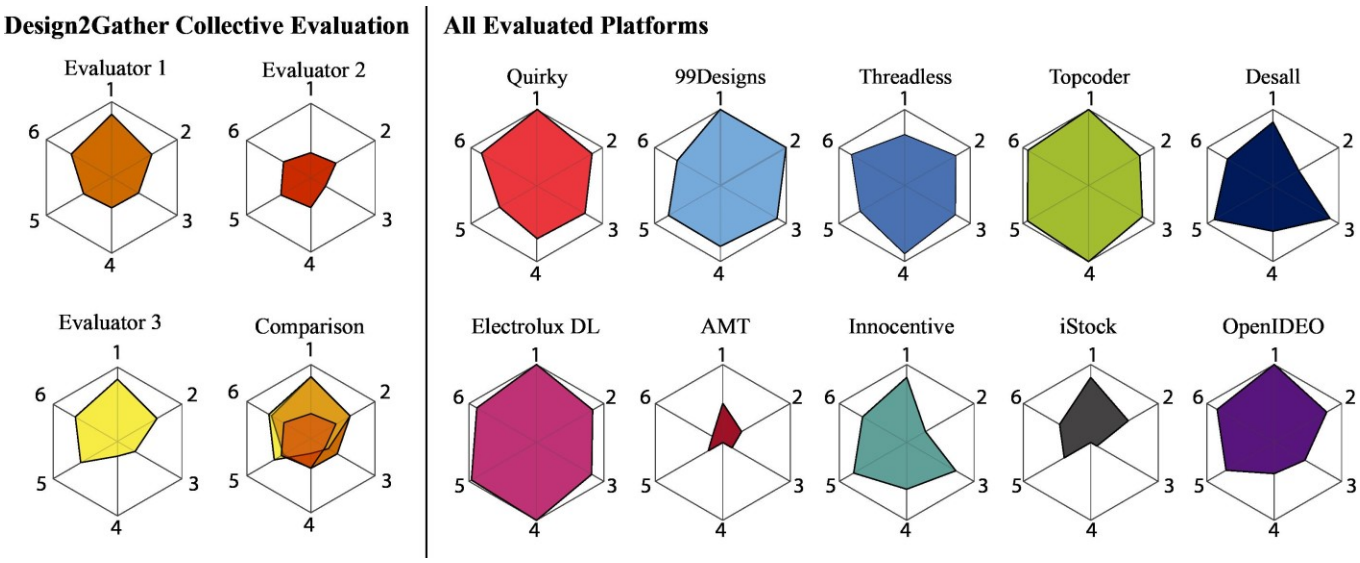

Figure 7: Radar diagrams based on the heuristics evaluation of various crowdsourcing platforms. The numbers resemble the heuristic: 1 = purpose; 2 = Moderation; 3 = Members; 4 = Common ground; 5 = Contribution; 6 = Platform

None of the platforms supports mechanisms that help recruit new members by using its existing members. The possibilities are more passive as a form that user can fill in on the bottom of a page, to invite a friend. However it doesn't offer any benefits for the member that recruits the friend. Look at for example at Dropbox, that give 250MB of extra storage space www.dropbox.com, when one would invite a friend. However, a challenge we recognize for crowdsourcing is that such a feature might be perceived as a conflict of interest: by inviting members, one creates more competition for themselves.

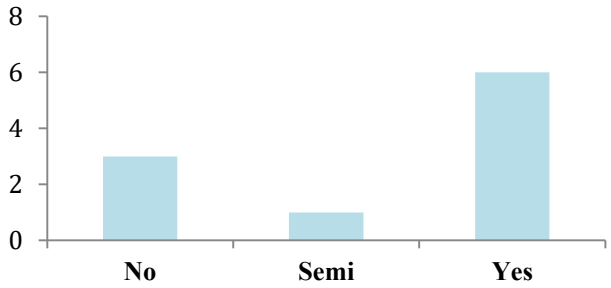

Figure 8: Reputation: the platform showcases its achievements like growth, amount of contribution etc. well (N=10). Most platforms show this information, often on the homepage for new visitors to see.

In our results, most platforms showcase their achievements and crowd's submissions (e.g Desall). This showcase acts as a motivator to engage the users to submit more content and improve its quality. On the other hand, we also found that other platforms (e.g. Threadless) do not showcase this information or is partially shown, which could result in low quality or a low amount of submission.

Radar diagrams (Figure 7) are perfect for this kind of analysis, because they give a recognizable shape based on the score. The more circular the radar, the more balanced the score; the spikier the radar, the more variation in the score [18]. The size of the radar plot on the axes indicates the score percentage itself, showing good and bad areas. As a preliminary research result, we found in the collective evaluation – applied to Design2Gather – a significant overlapping in the results from different evaluators. These results show that the evaluation procedure and heuristics proposal can be tools to analyze the community features integrated in a platform as a whole. The radar diagrams are not a result to define if certain platform is successful or not, but rather to gather data about how the platforms are using and integrating the online communities. As an example, we found how the results of Amazon Mechanical Turk and iStockphoto are comparatively lower among the others, even when both of them are recognized and successful platforms (in terms of profit and results). In the other hand, some platforms almost fill the entire diagram (e.g Electrolux Design Lab or Topcoder).

DISCUSSION

Taking a bird's eye view of the results, we can tentatively conclude that certain crowdsourcing platforms make a clear decision in whether to actively include their community. Platforms like iStockphoto and Amazon's Mechanical Turk seem to narrow the community mechanisms down, when for example 99Designs embraces their community with an active community forum. The heuristics can be useful tool for crowdsourcing platforms, that want to reinforce the community's inclusion.

The heuristics offer as a tool for discussing among experts. Already when evaluating the different crowdsourcing platforms, in depth discussing could be held on for example the ideal placement of the regulations. If crowdsourcing

platforms developers and designers would use these heuristics individually, they could use it as a guidance and find differences in how successful the platforms already is.

It would be interesting to compare if the intrinsic motivators are improved in a crowdsourcing platform by supporting community like behaviour, if this could lower the extrinsic motivators such as the amount of prize money. If a crowdsourcing platform would offer more mechanisms that online community have, it could help to fulfil more motives like social contact. This can lead to more members being motivated to contribute, higher quality of contributions and recruitment of new members. Especially since higher prices for tasks only increased the quantity of tasks completed, but not the quality of work that people did [22]

Recent research supports our claim that crowdsourcing can benefit by applying community heuristics [9]. Gray's et al. (2016) research shows that although platforms like AMT remove almost everything from the work process, workers find their own ways of collaborating off-platform. This paper also confirms our finding that many platforms do not supply the tools to connect workers. If workers put so much effort, in creating ways to collaborate themselves, one can argue that it would be beneficial for the workers if the platforms provided this themselves.

Using the visual of the heuristics (Figure 1) the feedback was structured and used to guide the discussion about the Design2Gather's current situation. The director claimed to have gained many new insights and ideas and communicated this to the development team of the platform. Already some suggestions have been implemented in the platform such as: making the moderators more visible, displaying the amount of contributions per "designment" (design assignment) and showing the winning contribution to the participating members in order to show the desired level of contributions.

CONCLUSION

We have shown that applying online community heuristics on crowdsourcing platforms, will reveal possible design improvements. The heuristics show that crowdsourcing platforms differ in the amount of tools and mechanisms that the platforms offers, to be considered a successful community. The heuristics can be used together with the platform owners to act as a tool for discussion. Many more crowdsourcing platforms would have to be evaluated, to make a conclusion about the current design state of crowdsourcing platforms.

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