Crowdfunding scientific research: a case study based on user research

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CROWDFUNDING SCIENTIFIC RESEARCH:
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ABSTRACT

Over the years, funding scientific projects have been the responsibility of traditional research funding institutions. Many projects were not getting funded due to the difficulties of accessing government funds. Crowdfunding has provided an alternative means of providing financial solutions to projects which ordinarily are not of interest to government funding agencies and other major funders of research. A crowdfunding platform is an internet-based matchmaker where the citizens (the funders) are matched with the researchers who are seeking funds to finance their projects. This paper investigates the users of a nascent crowdfunding channel for Social Sciences and Humanities. The users are the Social Sciences and Humanities researchers who seek financial support on scientific projects and the funders who are motivated to invest in a project. The goal of this research was to find out about the user needs and preferences to help in the decision-making about this nascent crowdfunding channel. We utilized the mixed method of research design to collect both qualitative and quantitative data about the users and their needs. This included codesigning work and a Europe-wide questionnaire. The outcome of this work was formalized in a set of practical recommendations for the new crowdfunding channel.

KEYWORDS

Crowdfunding, Crowdfunding Platform, Scientific Research, User Experience

1. INTRODUCTION

Crowdfunding is an innovative practice where many people fund projects by giving small sums, using internet-based platforms. Crowdfunding clearly is an increasingly important practice in our digital society. According to Calic (2018), crowdfunding is a process of sourcing small contributions from many individuals to support a proposed idea through an online platform. Crowdfunding can be applied and used in many areas which include supporting product development Belleflamme et al., (2013), the creation of artistic projects Dalla and Dekker, (2021), in taking stakes in a start-up (Belleflamme et al., 2014). Recently, the potential of using crowdfunding for scientific research has been highlighted in the literature, as a novel avenue of funding research (Dahlhausen et al, 2016, Sauermann et al, 2019, Vachelard et al, 2016, Wheat et al 2013). Traditionally, it is the responsibility of government agencies to fund research projects (Deng et al, 2022). However, the difficulties in accessing government-funded projects in many countries made crowdfunding an alternative means of providing funding for research projects (Laurell et al, 2019, Moritz and Block, 2016). According to some authors, crowdfunding of science could bring a more democratic decision process to research by allowing the public to be part of the research they believe in, including curiosity-driven scientific research Perlsterin, (2013), and allowing to fund projects which are not funded by public agencies.

In line with this assumption, the EU TRIPLE project has launched its own crowdfunding initiative, crystallised in the creation of a new crowdfunding channel. The project's aim is to design and develop the (https://www.gotriple.eu/) discovery platform for Social Sciences and Humanities (SSH) publications, data, and projects. In addition to the core discovery services, GoTriple discovery platform has several innovative services including a trust-building system, an annotation tool, a crowdfunding solution, a recommender system, and a visual search interface. Alongside the creation of the main platform, research was conducted for setting up the GoTriple innovative services, which included research for a tailored crowdfunding channel dedicated to SSH projects. It is this work on crowdfunding we are concentrating on in this paper.

One important consideration is that in the crowdfunding landscape, one could identify three main types of actors: the funders (people giving money), the people proposing a project, (researchers in the case of science, inventors, etc.), and the crowdfunding organisations (the intermediary platform). Much focus in the literature has been on the motivations of funders and why they decide to give money to a specific project or endeavours. Similarly, a significant amount of research has been devoted to understanding how to set up a specific campaign, i.e., the point of view of those proposing a project. However, there is comparably less research focused on crowdfunding organisations. Particularly, on the challenges that creating a new intermediary approach may entail and what knowledge is important to acquire to create a new crowdfunding initiative, with a focus on the crowdfunding of science and SSH more specifically.

To address this and answer the main research problem of "what elements should be taken into account when creating a new channel for the crowdfunding of research, with a focus on SSH?", we have designed research encompassing two different studies: 1) a codesign study conducted with both potential funders as well as proposers (i.e. researchers) and 2) a Europe wide questionnaire aimed specifically at funders. With both activities, our goal was to provide knowledge to address the practical problem of setting up a new intermediary for SSH crowdfunding with a major focus on the users.

In this context, the users of the crowdfunding platforms are people who either put money into a project of their choice or researchers who seek funds to carry out a project. These individuals are further explained in this study as the crowdfunding stakeholders. With the codesign, our goal was to gain some qualitative and experiential insights allowing us to discuss directly with participants. The questionnaire instead was designed to have potentially a broader overview. In any case, both activities were functional to the goal of the research. The analysis of the data generated by both studies resulted in a series of recommendations for the project and in influencing the decision-making about the crowdfunding initiative.

2. REVIEW OF RELATED LITERATURE

This literature review will focus on previous findings regarding scientific crowdfunding which are relevant to inform the design of a scientific crowdfunding platform, followed by a review of the limited findings on general crowdfunding from a user perspective.

2.1 Crowdfunding Stakeholders

There are three key players involved in the crowdfunding process according to Tomczak and Brern (2013), the fundraisers, the intermediaries, and the investors. These were also described by Moritz and Block (2016) as capital providers, capital seekers, and intermediaries. Other authors such as Jovanovic (2019) and Petruzzelli et al (2019) identified these key players as the project creator, the campaign to be funded, the supporters (i.e., the crowd), and the crowdfunding platform. In this research, we refer to these key players as the proposers, the intermediary, and the funders.

2.1.1 Proposers

The proposers are individuals or organisations seeking funds to carry out a project. Generally, we can understand that crowdfunding helps to finance new project ideas (Lehner, 2016). The researcher (as the proposers), in the case of the crowdfunding of science, will take the project idea to the crowdfunding intermediary which will review the importance of the project and will coordinate the fundraising through their crowdfunding platform. According to Mollick (2014), the portfolio/track record of the researcher is important as it is a proxy that should signal the quality of the project to be funded. To gain funding, the proposer needs to capture the attention of many people by convincing them that the proposed project is worthy of their investment (Wheat et al, 2013). The proposer needs to clearly state the problem they are trying to solve and how they intend to solve it to enable the funders to understand how their gifts can make a difference (Mollick, 2014). If a proposer can demonstrate beyond reasonable doubt how they will address the problem with a tangible action plan, potential funders will likely invest in it.

2.1.2 Funders

These are the group of individuals (the supposed crowd) who offer their money to a preferred innovation or project. The crowd is the central element of any successful crowdfunding campaign, including for science (Mollick, 2014). The funders not only offer their money but also their opinions (Stonko and Henard, 2017). Some funders can support the creator's ideas and strengthen connections with people in their social networks without any rewards (Bi et al, 2017). Funders often want to be engaged in the project alongside the innovating research, as that experience is typically considered to be a rewarding part of the process (Agrawal et al, 2015). As noted by Bi et al (2017), a funder or investor will consider the information provided about a project before considering whether to invest or not.

2.1.3 Crowdfunding Organisation/Intermediary

The crowdfunding organization, the intermediary, provides the Internet-based platform or the crowdfunding platform, normally a website that enables matchmaking between proposers and funders (Agrawal et al, 2015). Financial pledges can be made and collected through the crowdfunding platform. The project will be published on their website, then the funders can look at the information advertised and decide whether they want to invest in the project or not (Bi et al, 2017). So, in simple terms, the crowdfunding platform is a matchmaker between the fundraiser and the investor (Belleflamme et al, 2013, Calic, 2018). A study by Hemer, (2011) has categorized crowdfunding platforms into four main types: donation-based, reward-based, lending, and equity base platform. Crowdfunding of research is normally donation-based (Allison et al, 2015). Crowdfunding platforms generally provide two keyways to pitch a project: a narrative and a short video (Mollick, 2014).

2.2 Crowdfunding Models

A project or business idea may be appealing to a funder, and they may be interested to invest in such a project. The attraction to fund a project may be self-determined to achieve a desired goal and this could be dependent on the crowdfunding type/model.

2.2.1 Reward-Base Model

In this type of model, funders receive a reward for backing a project (Mollick, 2014). Reward-based crowdfunding allows individuals to donate to a project or business with expectations of receiving in return a non-financial reward, such as goods or services, at a later stage in exchange for their contribution (Calic, 2018, Zhao and Shneor, 2020). The funder may be motivated by the benefit offered.

2.2.2 Equity-Base Model

This is a crowdfunding model that allows the funder to invest in a business idea while they are offered equity in that business. This model is like selling a stake in a business to several investors in return for investment (Moritz and Block, 2016).

2.2.3 P2P Lending Model

This is a type of crowdfunding where funds are offered as a loan, with the expectation of some return. In this model, Mollick (2014) noted that the lender may be more interested in the social good promoted by the venture than any return generated by the loan, thus including patronage model elements as well. According to Allision et al (2015) lenders respond positively to narratives highlighting the venture as an opportunity to help others, and less positively when the narrative is framed as a business opportunity.

2.2.4 Donation-Based Crowdfunding or Patronage Model

This model places the funders in the position of philanthropist and the investor expects no return for their donations. Donation-based crowdfunding according to Hemer (2011) is a form of fundraising where backers provide funding based on motivations without expecting any form of rewards. This type of crowdfunding is different from traditional base fundraising as it provides a way for potential donors to reach people/groups in need of help without the constraints of physical distance (Tanaka and Voida, 2016). This is supported by Agrawal et al (2015) who noted that donation-based crowdfunding allows greater efficiencies in terms of geographical reach.

Scientific research can be considered a type of donation-based crowdfunding, as there is usually no tangible reward for the funders (Schafer et al, 2018, Mollick, 2014). However, some projects also provide non-monetary rewards such as photographs, lab visits, guest lectures, dinners, etc. Sauermann et al, (2019), Mollick, (2014), and in these cases, scientific crowdfunding may overlap with reward-based crowdfunding.

2.3 Crowdfunding from a User Perspective

In scientific research, crowdfunding has broadened access to resources for groups that have been excluded or disadvantaged in traditional funding systems (Sauermann et al, 2019). While there is ample literature on crowdfunding Agrawal et al, (2015,) Belleflamme, (2014), Mollick, (2014), especially on the motivations of funders Gerber, (2012), we want to concentrate on literature that studied users of crowdfunding platforms. A limited number of studies have attempted to explore user needs for the crowdfunding platform and refer to more general crowdfunding, rather than scientific crowdfunding. A study by Prom et al (2016) observed that the content and interface elements on crowdfunding platforms convey necessary information for the users to process. User research on a crowdfunding website in Indonesia identified user needs such as user profile customization, receiving information and news through the platform, a variety of payment methods and funding model types, and user support for creating campaigns and for campaign marketing (Perdana et al, 2017). In the context of equity crowdfunding, user research found that individuals lacked information about financial terminology and pay most attention to the risks presented at the top of a risk warnings page (as opposed to the bottom), suggesting platforms should present major risk warnings first and provide either a list of technical or financial terms to facilitate users' investing (Prom et al, 2016). A study by Lipusch et al (2021) explored the design elements that encourage co-creation (conceptualised as involving feedback and funding) on reward-based crowdfunding platforms. They tested the role of three design principles in influencing co-creation: the provision of multiple sources of information about the project (e.g., external reviews), encouraging funders to express their preferences (e.g., through participatory updates where they can provide feedback), and involving funders in product decisions (e.g., through voting on product features). The purpose of this research is to seek user preference in the codesign process in setting up a new intermediary crowdfunding platform.

3.   METHODOLOGY

As stated in the introduction, our goal was to gather knowledge for the set-up of a new "intermediary channel" - i.e., a new crowdfunding initiative for Social Sciences and Humanities (SSH). For this purpose, we utilized both qualitative and quantitative data collection methods as this combination could ensure that the limitations of one type are balanced by the strengths of the other. This mixed method design was assumed to enable us to gain insights into what matters and in which way it matters to the users-funders when it comes to crowdfunding. Moreover, the integration of both methods would help us to gain more insight into answering the research questions. For this purpose, we conducted research articulated around two studies: a qualitative and design-oriented study (study 1) and a quantitative study (study 2) based on a questionnaire.

3.1 Study 1 and 2

In study 1, we collected qualitative data through codesign both one-on-one sessions and workshops. A total of 19 participants were selected using a purposive sampling technique: 9 participants took part in the workshops and 10 participants took part in one-on-one interviews, see Table 1. In study 2, quantitative data was collected through an online questionnaire. A total of 586 respondents took part in study 2, see Table 1. To facilitate an Europe-wide response, the questionnaire was prepared in English and then translated into six other languages. We utilized a snowball sampling method in reaching out to the audience. The questionnaire contained largely Likert scales aimed at measuring the perception of respondents on specific issues, such as the kind of project respondents would be willing to fund or questions about what should happen after the funding. The questionnaire data were analysed with descriptive statistics. Later in the presentation of results of the results, we will assume that the positive response is the sum of the positive items of a Likert scale (e.g., the sum of "strongly agree" and "agree" responses), whilst the negative response is the sum of the negative items of the scale (e.g., the sum of "strongly disagree" and "disagree" response).

Table 1. The number of participants for the workshops, interviews, and surveys

User	Workshop	One-on-One interview	Survey
Funder	4	5	586
Proposer	5	5	–
Total number of participants	9	10	586

4. FINDINGS

4.1 Study 1

4.1.1 Why Do Funders Invest in Crowdfunding Projects?

Participants in the workshops explained that the reasons they had made donations in the past were based on having empathy with the crowdfunding cause, and this made them feel that donating would have a positive effect on the common good. This is in line with Belleflamme (2013) who believe that funders are motivated when they felt that they were contributing because of the project cause.

4.1.2 What Would Guarantee the Quality of a Project?

Participants mentioned that proposing researcher should collaborate with researchers from other institutions and ensure that researchers have sufficient expertise in the chosen topics. Receiving recommendations from other researchers about the quality of the projects was seen as important. Moreover, ensuring high ethical standards and open access were also seen as relevant. The proposal should show the profile of the person responsible for the project with a good description of the proposed methodology and expected outcome. A researcher should show transparency about what the funding will be used for/how exactly the money will be spent using accessible language. Researchers should also show similar projects concluded, disclosing any conflict of interest, and show a calendar for the follow-up (disseminating results). Researchers prefer a platform with a guide on how to put together a good proposal giving a clear description of whom the target audience is going to be.

4.1.3 How Would Funds Be Managed?

The researcher agreed that the researcher's institution should manage the fund or via an associated bank account where movements can be traced by funders. Another suggestion is by using a virtual 'wallet' created via the platform. Researchers should provide a quarterly report on how money was spent. The research should as well be peer-reviewed.

4.2 Study 2

4.2.1 What Type of Research Are Potential Users More Likely to Support?

In the questionnaire, we asked what projects would be of interest to participants. The rationale for this data was to obtain knowledge for prioritizing decisions on the initial projects that could appear on our crowdfunding channel, especially during an initial bootstrapping phase. The proposed statements did not focus on research topics but rather on various aspects that could compose a project proposition, including the nature of the proposers, the impact of the project, and aspects of direct interest for potential funders. The results in Figure 1 show a strong positive response to the statement on willingness to fund projects that have a clear social impact (S1_societal_impact), with 85.8% positive responses. Of relevance are projects that are local to the geographical area of the funders (with a positive response at 60.9%, S1_geographical_area) and projects that see the involvement of civil society partners (at 61.8% of positive response, S1_civil_society). An interesting consideration is in relation to risks, respondents regard slightly more favourably projects which carry low risk (and are less ambitious, S1_low_risk_projects with 41.6% of positive response) than high-risk and more ambitious projects (S1_high_risk_projects with 33.4% of positive response). The question with the lowest positive response (and the highest negative) is the one on whether people would prefer to fund projects proposed by a university in the area where they live (S1_University_my_area with just above 20% positive responses and 43.3% negative). Perlsterin, (2013) mentioned that projects are supported based on their impact.
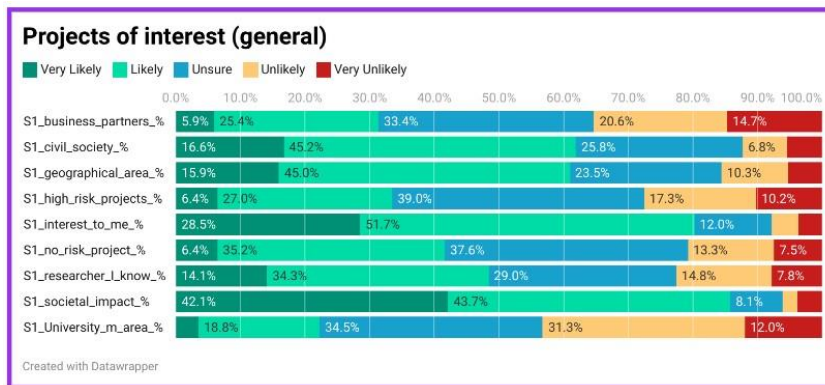
Figure 1. Projects of interest, that participants would be more likely to fund

4.2.2 What Are the Expectations of Users After the Project Conclusion?

In the questionnaire, we also asked respondents to tell us what should happen after the end of funding. This is an important component of success for crowdfunding. Results are presented in Figure 2. Respondents provided a strong positive response to the question about being informed of the project completion (A1_project_completed) with 95.5% of positive responses. Clarity on the ethical implication (A1_ethical_implications) of the project also is significant to note with 93.9% of positive responses. Three other statements received positive responses above 90%, the ones related to the acknowledgment in publications that the project was crowdfunded (A1_acknowledge_crowdfunded); the possibility to receive information about the progress of the project (A1_progress_information); the importance of the data collected by the crowdfunded project to be released as open data, where possible (A1_data_open). Two statements received if compared to the previous ones, relatively low positive responses (nonetheless still above 50%). The first one is the statement asking participants if they would be interested to be involved more in a project (e.g., as citizen scientists) (A1_involved_more) at 62.1%. The other statement was asking whether respondents would be interested to discuss the results of the project with the researchers (A1_discuss_results). This presents 57.3% of positive responses.
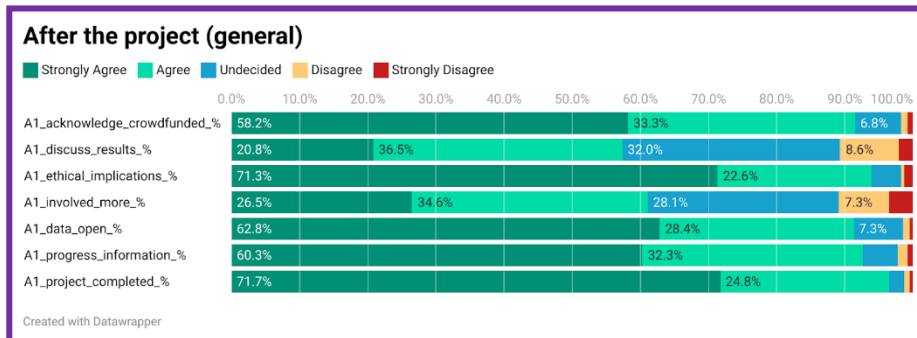

Figure 2. Expectations of users after the project

5. RECOMMENDATIONS/DISCUSSION

The results from studies 1 and 2 were formalised in a set of recommendations for setting up the GoTriple crowdfunding SSH channel. The results revealed that funders believe that projects with societal impact, especially projects that focus on the common good, should be promoted. Therefore, a first recommendation would be for the new channel to prioritize projects with clear societal impact. It was clear from the results they need to prioritize during the bootstrapping phase of the new crowdfunding channel, projects which are team-based rather than individual-based. Moreover, a further recommendation was to prioritize projects which

carry low risks but that can reach their objectives, rather than risky projects. This may help build trust toward the platform and its capacity to deliver on the projects promoted in the platform. Whenever possible, it should be a condition of the publication of the project on the crowdfunding platform, that the researchers should make their data open at the end of the project (once the relevant publications have been completed). It was also clear the need to accompany the project proposal with reference letters and to include with the project an ethical statement. These were additional recommendations formulated by this research.

The results of this research have provided the project team with important material for setting up a new crowdfunding channel for SSH. This channel (https://wemakeit.com/channels/operas) is now managed by OPERAS, the Research Infrastructure supporting open scholarly communication in the social science and humanities. GoTriple is one of the OPERAS services. To date, two projects have been successfully funded through the OPERAS crowdfunding channel.

6. LIMITATIONS OF THE STUDY

6.1 Study Focus

This study focused on understanding the needs and preferences of users on a research-based crowdfunding platform with a focus on deriving recommendations for setting up a new crowdfunding channel initiative for SSH. As users of other platforms differ in their aim of investing in a particular project, this study should be repeated on other types of crowdfunding to understand the differences or similarities of users' needs and preferences of those crowdfunding types.

6.2 Sample Size (Qualitative Data)

One of the limitations of this study was the number of participants that took part in the workshops and one-on-one interviews were relatively small and may not necessarily be a good representation of the study population. However, in codesign, it is common to work with a small sample to derive insights.

6.3 Sampling (Quantitative Data)

Another limitation of this study is the distribution of the study sample of the quantitative data. The sample consisted of more researchers although we collected a reasonable quantity of data from the public, we believe that this may likely have an impact on the results. The distribution of the questionnaire was through the project's social media network. This medium may have attracted more researchers to take part in the study as the researchers have more of their colleagues in their contact.

6.4 Implications of the Study/Future Work

The result of this research has revealed that the interface should be able to convey transparency about the potential research project, the funding, and how it will be managed. Additionally, the result of the quantitative survey revealed several important insights from the funder's perspective and preference for low-risk projects and the need to receive regular updates about the research progress and findings. Future work should concentrate on the participants of the projects piloted with the new crowdfunding channel. This will help us understand what works and what could be improved in the new solution.

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