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How do we study crowdfunding? An overview of methods and introduction to new research agenda[1]

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Abstract

Purpose: Crowdfunding is a global phenomenon of rising significance and impact on different areas of business and social life, investigated across many academic disciplines. The goal of the article is to present the variety of methods applied in crowdfunding research, assess their strengths and weaknesses, offer the typology of methodological approaches, and suggest the most promising direction for further studies.

Design/methodology: The paper is based on the review of the most recent academic and industry literature on crowdfunding and own analysis of data presented by crowdfunding platforms' operators.

Findings: The article incorporates interrelations of methods, goals of inquiries, and types of results to propose a typology of methodological approaches that researchers currently apply to crowdfunding: from platform-centred to multi-sited. The authors discuss the advantages and limitations of the identified approaches with the use of multiple examples of recent and most influential studies from the field and propose the most urgent direction of future inquiries.

Research limitations/implications: The overview renders crowdfunding studies more accessible for potential newcomers to the field and strengthens transdisciplinary discussion on crowdfunding. Despite the broad variety of the analyzed articles that reflect the newest trends, the sample is not representative in the statistical meanings of the term.

Originality/value: The article offers the first review of methodologies applied in the transdisciplinary area of crowdfunding studies and connects it to broader methodological discussions about transdisciplinary research on the digital phenomena. The review strengthens the transdisciplinary dialog on crowdfunding.

Keywords: crowdfunding; fintech; methodology; Internet research; big data

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Introduction

Various forms of crowdsourcing, understood as strategies to use the dispersed individuals to obtain "ideas, feedback, and solutions to develop corporate activities" (Belleflamme et al., 2014, p. 586) have a growing impact on the development of new products (Chesbrough et al., 2006; Goldman and Gabriel, 2005; Gryczka, 2013), which results in "shifts in the locus, structure, and nature of innovation" (Felin et al., 2014, p. 222). Both start-ups or informal groups and large, knowledge-intensive organizations like Dell or NASA (Bayus, 2013; Richard and Davis, 2014) apply strategies such as user-driven innovations (von Hippel, 2005; Pełka, 2013) to enhance the innovation processes by voluntary contributions from multiple external stakeholders. Crowdfunding (CF) constitutes a specific type of this mechanism: entrepreneurs use one of the dedicated Internet platforms to reach individuals who share the common interest and the will to support the venture with the small contributions (Valenciene and Jegeleviciute, 2013). In the classic form of crowdfunding, individuals who support projects (backers) receive rewards (perks) in exchange for their support. In more recent modifications, they may receive shares of the venture or interest from the loan. Thus, along with other financial innovations enabled by technological development, CF is changing the landscape of entrepreneurial finance around the world with the utilization of the potential of social networks mobilized through online platforms (Bruton et al., 2015; World Bank, 2013; Wardrop, 2015).

However, crowdfunding offers more than capital for the venture. Apart from financial gains, entrepreneurs may take advantage of other benefits from engaging with the digital community, like feedback in product development, encouragement, or publicity among potential early adopters (Golić, 2014). Crowdfunding is the most suitable for firms at the initial stage, which often experience difficulties in attracting capital (Belleflamme et al., 2014).

From the theoretical perspective of organization studies, the proliferation of CF challenges the existing understanding of work, creativity, and innovation, as well as organizational boundaries (Gleasure and Feller, 2016). It also raises questions about the impact of "crowdfunding revolution" on such established domains as creative work, innovation development, or banking (Mollick and Robb, 2016). Does crowdfunding open radically new options or transform the whole logic of these domains or is it doomed to remain a niche innovation without the potential to transform the dominant regime (cf. Geels, 2004)?

As crowdfunding impacts different areas, research on this phenomenon draws on a wide range of academic disciplines. As a result, it is both interdisciplinary and

dispersed. The Scopus database search performed in May 2017 returned 627 documents spread across 24 subject areas: journal articles, conference papers, books, and chapters. This makes the identification of the most relevant knowledge gaps both problematic and time-consuming. Hence the recent few literature reviews in this field (Gleasure and Feller, 2016; Moritz and Block, 2016; Macht and Wheatherston, 2015). Another consequence of the wide array of disciplines impacted by crowdfunding – from sociology and media studies through entrepreneurship and management to law, accounting and economics – is an extensive variety of research methods applied to answer crowdfunding-related questions. Additionally, the fact that crowdfunding is a digital phenomenon opens both new possibilities and challenges for methodological choices. On the one hand, a researcher has to master new skills of digital studies; on the other hand, there is a possibility – or temptation – to limit the study of the whole phenomenon only to its "digital layer." The situation, however appealing, may leave important questions about the impact of crowdfunding unanswered. Despite these challenges, the debate on the relative strengths and weaknesses of different methods of crowdfunding research is virtually non-existing.

To fill this gap, we offer an overview of the current methodological approaches employed in crowdfunding studies across different disciplines and discuss the consequences of each methodological decision. To this end, we conducted a review of literature on crowdfunding with the focus on evolving research agenda and differences in adopted methodological approaches. We firmly believe that the review will contribute to the strengthening of the transdisciplinary dialog on crowdfunding and the evolving debate on research methodologies for this digital phenomenon. Last but not least, the study facilitates the contribution from researchers new to the field, who must understand the current debate and available methodological options.

However, the review comes second, after a concise description of the current trends in crowdfunding. As the landscape of crowdfunding platforms dynamically changes and always outstrips peer-reviewed works, we supplement this part with an overview of online materials from the main stakeholders in the field; that is, crowdfunding platforms[4] and statistics from public and private research and consulting institutions. Thus, we apply a mixed approach which joins a review of the methodological developments in academic literature with a systematic presentation of current developments in crowdfunding platforms based on online research and industry literature review.

[4] The selection of platforms in our analysis is based on three main criteria: popularity, size (defined by the number of campaigns or amount of collected capital), and years since launch. To identify the platforms, we referred to online industry literature, e.g., crowdexpert.com or statisticbrain.com (http://crowdexpert.com/investment-crowdfunding-platform-directory and https://www.statisticbrain.com/crowdfunding-platform-statistics/) Whenever possible, we included at least one Polish platform of each CF type.

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That is, after presenting a brief overview of circumstances leading to the surge and proliferation of modern crowdfunding, we offer a review of both established and emerging types of crowdfunding platforms. Next, we proceed to the critical review of academic scholarship, structured around the typology of methodological approaches focused on the variety of methodological approaches and their theoretical consequences. Finally, we suggest the most promising directions for further research.

What is crowdfunding?

History and trends

To better understand the methodological challenges that crowdfunding researchers face, we need basic knowledge of this phenomenon, including its latest trends and developments. Both practitioners and academics agree that CF is not an entirely new phenomenon, what confirm such examples from the past as raising funds from 1400 investors to produce the Crocodile Dundee movie (Guilliatt, 1988). Moreover, the owners of some crowdfunding platforms directly refer to the past when companies could have been funded by friends, neighbors, and local communities (see, e.g., Wefunder).[5]

The key difference today is the use of online platforms to connect dispersed individuals (Kuti and Madarász, 2014; Sigar, 2012; Valanciene and Jegeleviciute, 2013; Wheat, Wang, Byrnes and Ranganathan, 2013). ArtistShare is considered to be the first modern online CF platform: founded in 2001, it launched its first project in 2003. Widespread Internet access was the first and main enabling condition; however, the most dynamic growth of modern crowdfunding started after the advent of the so-called Web 2.0 (O'Reilly 2005; Ordanini, Miceli, Pizzetti and Parasuraman, 2011). It allowed more interaction and cooperation between Internet users and was critical for the match-making between entrepreneurs and investors. The introduction of affordable and secure international online payments also played an important function. Here, the key role was that of companies such as PayPal, established in 1998; however, the online use of credit and debit cards, which has grown significantly since 2000, is not to be underestimated.

Needs of investors and entrepreneurs and the growing frustration with traditional financial services are among the conditions which helped modern crowdfunding gain

[5] We may perceive Wefunder as progenitors of equity-based crowdfunding in the US, as they actively lobbied for its legalization, shared their comments on the proposed rules, and saw it through until implementation in the law in May 2016.

momentum. It was especially clear after the 2008 financial crisis which led to high-risk aversion among bankers (Harrison, 2013) and a cut in interest rates that pushed investors to look for alternative, simpler, and more easily accessible ways of investing (World Bank, Finance and Private Sector Development Department, 2013). In this context, the funders of Wefunder, who are devoted supporters of crowd equity funding, explain their motivation in the following terms: "we thought the Venture Capital model was dysfunctional and focused only on helping a tiny sliver of deserving businesses. Finally, we felt banks were taking less and less risk" (Wefunder). Indeed, online CF seemed the perfect answer. The Internet as a quickly-evolving, open, and low-entry environment provided an excellent arena for experimenting with different approaches to CF. Thus, a multitude of platforms emerged to test new solutions and market niches.

How to summarize the current state of crowdfunding? A simple Internet search returns plenty of information about CF development, such as articles, reports, and statistics on the annual amount of collected funds, number of CF platforms, campaigns, and other related figures (CrowdExpert.com, 2017; CrowdFunding Playbook, 2017). Unfortunately, due to the decentralized and dispersed nature of this global phenomenon, most of the data is incomplete, insufficiently reliable, or incomparable across regions, time periods, and CF types. Some of the existing reliable sources, such as the Cambridge Alternative Finance Reports (e.g. Cambridge Centre for Alternative Finance, 2016; Cambridge Centre for Alternative Finance 2017), present the CF information per region and, thus, disallow the presentation of a concise picture of the global CF landscape and types that would be comparable across time periods. Besides, they offer historical data only from 2013. While such sources are of high value for detailed, regional CF studies, we decided to use the data from the Massolution reports (2012; 2015).[6] According to these reports, the annual average growth rate of funds collected globally through CF platforms was above 200% between 2009 ($0.53 billion) and 2015 ($34 billion). This rate steadily grew from 160 percent, between 2009 and 2010, to 265 percent between 2013 and 2014. Even though it fell to 209 percent between 2014 and 2015, it remains an impressive increase which indicates a growing interest in the opportunities offered by CF.

As for the popularity of crowdfunding in different regions, major changes among the top three regions are evident. In 2012, Asia was not even mentioned as a separate region but presented together with Oceania, South America, and Africa. Three years later, the amount of funds raised in Asia through CF platforms accounted for over 30 percent of the global volume and gave Asia the second place, pushing Europe to the third.

[6] Massolution reports base on Crowdfunding Industry Surveys, conducted by Massolution, and follow-up research conducted with the aim to complete the profiling of global crowdfunding (Crowdsourcing.org and Massolution, 2017). They have been published annually by Massolution/Crowdsourcing.org.

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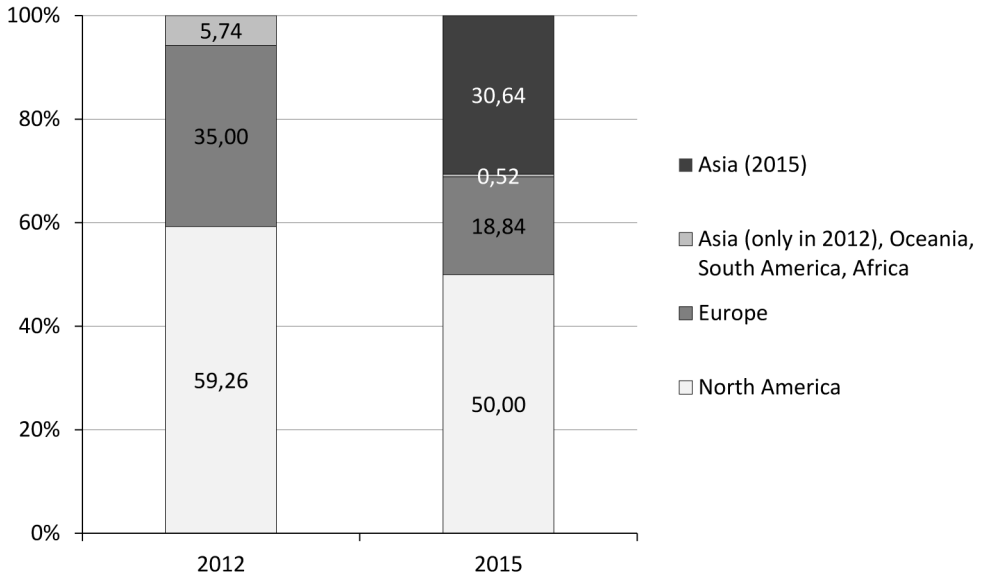
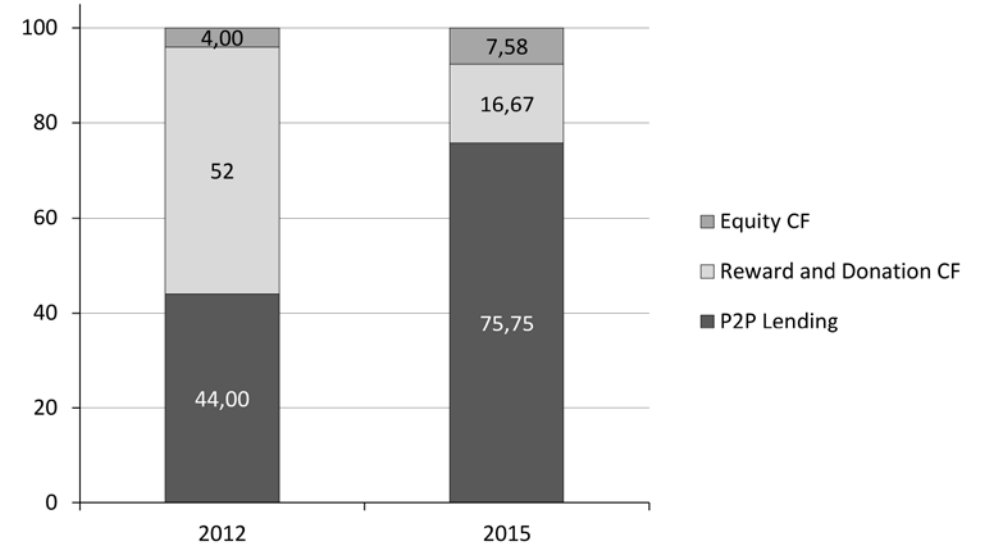
Figure 1. Percentage of crowdfunding raised by region 2012 vs 2015



Source: Massolution and Crowdsourcing LLC (2015), PR Newswire (2013).

Figure 2. Percentage of crowdfunding raised by type 2012 vs 2015



Source: Massolution and Crowdsourcing LLC, (2015), BBVA Research Department (2015).

Figure 2 compares percentage split of amounts raised by different types of CF in 2012 and in 2015. Here, again, a major shift took place in the order of leading categories. Within three years, P2P lending became number one, accounting for almost two--thirds of all funds collected. Reward and donation CF took second place while equity CF remained in the third position, growing from 4.00 to 7.58 percent of all the raised funds.

Such major shifts demonstrate that crowdfunding is still dynamically developing and subject to relatively strong divergent trends. Nevertheless, there are signs suggesting that CF, at least in some aspects, is gradually stabilizing. Firstly, the basic mechanics and design of CF websites become standardized, with frameworks offered by white-label crowdfunding platforms like Launcht Inc. or WordPress themes and plugins like IgnitionDeck. Secondly, efforts of national and international legislators to balance interests of multiple equity-based CF stakeholders are gradually bringing results. Even though a thorough analysis of the evolving legislative landscape falls outside of the scope of this article, we point out to the most relevant and recent highlight in this area. The US equity CF market reached an important milestone on May 16, 2016, when the Title III of the Jumpstart Our Business Startups Act (JOBS Act) came into force. Since that day, all American investors have been legally allowed to buy equity in startup companies, not only those who meet the wealth and income criteria of accredited investors (US Securities and Exchange Commission, 2017). Unlike the US, Europe lacks an overarching law that would address the specific needs of CF investors and entrepreneurs. As of June 2017, the legislation remains fragmented in at least two dimensions: firstly, the member countries have their local regulations or guidelines; secondly, the EU-wide legislation related to CF is spread across multiple EU Directives and Regulations (*Crowdfunding in Europe*, 2017).

To sum up, the dynamic development of recent years resulted in the proliferation of different types of crowdfunding, not fully captured by the overview based on statistics. As this diversity constitutes an important aspect of methodological challenges, in the next section, we present a more detailed overview of different categories based on industry literature and our own review of self-definitions used by platform operators.

Crowdfunding types and its examples

The following list presents both the most popular, well-established models (1–4; see, e.g., Fleming and Soreson 2016, p. 7–9), and the relatively new applications of crowdfunding (5–6).

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Equity-based crowdfunding involves the cheap issuance of shares through the Internet, through which investors may acquire stock in corporations for a small amount of money with a claim over the company's future cash-flow. It opens access to funding for even those companies which have failed to receive funds from angel investors, government programs, friends, or family (Kuti and Madarász, 2014).

The analysis of self-descriptions of such equity platforms as Wefunder, SeedInvest, Crowdcube, Seedrs, and the Polish Beesfund revealed that democratization of access to capital is the dominant theme. They underline the inclusive nature of investments they offer; both for the entrepreneurs and investors: "We let all types of growth-focused businesses raise capital" (Seedrs); "enabling everyday investors to invest alongside professionals" (Crowdcube). Moreover, they stress that their purpose reaches beyond financial gain and, thus, position themselves in opposition to established banks and financial corporations, as in the following examples: "We aim to revitalize capitalism and keep the American dream alive" (Wefunder); "[We let everyone] invest in businesses they believe in and share in their success" (Seedrs).

Debt or credit-based crowdfunding also goes by the name of peer-to-peer (P2P) lending. Individual lenders contribute funds later disbursed as loans to requestors (borrowers) through Internet platforms. Neither financial intermediation nor collateral are usually present. Certain platforms offer peer-to-business (P2B) lending where pre-screened enterprises may access funds of private creditors (Kuti and Madarász, 2014; Moenninghoff and Wieandt, 2013). The similarities between such credit-based CF operators as Zopa, Kokos, Twino, Upstart, and Lending Club focus mainly on the benefits of eliminating the traditional intermediaries between creditors and borrowers. They stress that the services are fast, direct, and simple while financially attractive for both sides: "the whole process is fast, convenient and private" (Lending Club); "we directly match people looking for a low rate loan with investors looking for a higher rate of return" (Zopa).

Donation-based crowdfunding aims at supporting charitable, research, creative, and personal projects, in which contributors do not expect any financial or non-financial returns. The reward is more of an emotional nature, and the beneficiaries have no obligations whatsoever toward their backers (Kuti and Madarász, 2014; Loewenstein-Small, 2007). A review of donation-based CF websites such as Givology, Experiment, Kopernik, and GoFundMe shows that, from among all types of CF platforms, donation-based CF foregrounds the benefits to community and society the most.

Reward-based crowdfunding takes place when individuals donate to a project or business with expectations of a return in the form of a non-financial reward such as goods or services (European Commission, 2016).

A review of the main aspects underlined by the reward-based platforms such as Kickstarter, Indiegogo, and Polak Potrafi reveals several common themes. Firstly, they strongly concentrate on supporting entrepreneurial and creative spirit. Secondly, although they are for-profit companies, they do not present maximization of financial gains as their main objective. They claim to focus more on, for instance, redefining entrepreneurship, changing the way new ideas come to life, and empowering people (Indiegogo). As a Public Benefit Corporation, Kickstarter must consider the impact of its decisions on society, not only on shareholders. Finally, each of these platforms frequently repeats the importance of community involvement, cooperation, and impact.

Apart from these four main types of CF, there are also many smaller categories. We present three of them below, based on their potential, novelty, and distinctiveness.

Pre-purchase is a subcategory of the reward model, in which the contributors receive the product that the entrepreneur is making. For example, if the entrepreneur is producing a music album, the contributors would receive the album or the right to purchase it at a reduced price (Bradford, 2012).

Invoice crowdfunding takes place when businesses sell unpaid invoices or receivables, individually or in a bundle, to a pool of investors who are typically institutions and high net worth individuals; rates are set through online auctions (European Commission, 2016)

Litigation crowdfunding is a practice of third parties unrelated to the lawsuit, which provide capital to a plaintiff involved in litigation in return for a portion of any financial recovery from the lawsuit (Llex Shares). As of June 2017, this category operates mainly in the Anglo-Saxon countries such as the UK (CrowdJustice), US (LexShare), and Australia (Lawfunder).

To sum up, the modern Internet-based crowdfunding is a new incarnation of a concept known for decades. The wide and dynamically changing landscape of crowdfunding applications indicates that entrepreneurs and communities are restlessly testing these new opportunities. As a result – since crowdfunding impacts many industries and aspects of life – the research on crowdfunding requires diverse approaches and methods that will allow a better understanding of the phenomenon.

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Academic debate on crowdfunding: review of methodological approaches

What can researchers do to understand the diversified and evolving field of crowdfunding and its impact on the social and economic life? In this part of the paper, we discuss the methodological approaches employed by crowdfunding researchers in order to propose our own typology of different methodological choices. The analysis stems from the review of academic literature systematically conducted from November 2015. From our search result, we selected 90 articles for further analysis, based on their originality, impact, and the heterogeneity of the sample.[7] The articles investigated different aspects of crowdfunding, with the following key subject areas: campaign dynamics and success determinants; crowdfunding from entrepreneurs' perspective; impact of crowdfunding on particular areas such as art, technology, and banking; impact of crowdfunding on larger social and business processes; legal and accounting issues.

After analyzing the range of authors' methodological decisions, we created a typology of methodological approaches, which depends on the main source of data used for the research and – consequently – the topics the researchers were able to tackle with the selected approach. Below, we present the types and critically analyze in detail selected papers, which in our opinion represent the best strengths and limitations of specific approaches.

Table 1. The typology of methodological approaches used in research on crowdfunding

Approach (main source of data)	Techniques (operationalization, type of analysis)	Characteristics	Recent examples
Platform-centered: crowdfunding as subject	Big data analysis: big samples, limited number of variables	Datasets downloaded from the platform, quantitative analysis (regression, machine learning)	Siering, Koch and Deokar (2016)
	Quantitative analysis after manual coding: smaller samples, more variables	Quantitative analysis of data categorized by a human coder	Chen, Thomas and Kohli (2016)
	Qualitative analysis: small samples, qualitative analysis	Qualitative analysis of campaigns (e.g., discourse analysis)	Manning and Bejarano (2017)

[7] 90 articles served as basis for the typology of methodological approaches; in this article, we discuss only part of this sample in detail to give a better understanding of the strengths and limitations of the identified approaches, as the detailed discussion of all of them is not possible. For the sake of brevity, we also omit some technical specifics.

Secondary data: crowdfunding and its institutional context (macro level)	Available population statistics and crowdfunding statistics	Policy analysis	Dushnitsky et al. (2016)
	Legal analysis based on regulations	Regulation analysis	Silver and Kharti (2016)
Field work: crowdfunding and its meaning (micro level)	Case study	Focuses on the "real" (non-virtual) actions, not on the online dynamics of CF	Royal, Sampath, and Windsor (2014)
	Multi-sited study	Focuses simultaneously on the "real" actions of people or institutions and on the online dynamics of CF	Galuszka and Brzozowska (2017)

Source: own elaboration.

In the first approach, researchers use only data retrieved from crowdfunding platforms, often – but not always – employing tools for big data analysis. We call it platform-centered studies. This approach is the most specific for crowdfunding and similar to the studies of Twitter, Facebook, and other social media platforms (Rodak, 2017).[8] In the second approach, researchers use secondary data, such as reports and statistics, to answer crowdfunding-related questions. In the third approach, researchers generate new data: they reach beyond the data from the platform and secondary data, for instance, through qualitative field study or surveys with platforms' participants. Those three basic approaches have many varieties and can be mixed in a single study. Although all of these approaches may be used for each type of crowdfunding, from reward-based to invoice trading, they are not equally appropriate for each type of research questions and theoretical frameworks. In the following parts, we discuss options, examples, and consequences of these approaches, recounting selected studies, methodologies, and results. We predominantly concentrate on platform-centered research as it is the most popular and specific for crowdfunding.

[8] As demonstrated by Gillspier (2010), the researchers have to be aware that the decision of different service providers, such as YouTube, Facebook, or Kickstarter (not mentioned by Gillspier), to frame themselves as "platforms" serves their particular goals and often misrepresents the way they shape public discourse. The term, among other purposes, suggests "open, neutral, egalitarian, and progressive support for activity" (p. 6), but also takes responsibility for the content away from the platforms' operators. In the context of crowdfunding, we may think about the platforms' (ir)responsibility for fraudulent campaigns.

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Platform-centered studies

Big data analysis

The very feature that defines contemporary crowdfunding – its organization via online platforms – gives the researchers relatively easy access to the data about the past and current campaigns. Most platforms offer the possibility to browse archived campaigns. However, the search algorithms may be biased, for instance, toward successful projects. Moreover, the mechanisms of search algorithms are usually not clear and, therefore, the researcher may be unaware of the bias.

However, there is an alternative to the platforms' search engines: with the use of web crawler or public databases such as Crowd Berkeley, the researcher may relatively easily obtain numeric data about a vast number of campaigns, as big as dozens of thousands, and conduct a census-type study. Thus, the first and most predominant type of platform-centered studies consists of big data analysis: quantitative analysis of the basic data on the campaigns retrieved from the platforms. This approach is the most suitable for research questions related to the different aspects of the dynamics of crowdfunding campaigns. As the number of variables is limited, the biggest challenge lays in the operationalization of research questions – relevant in theoretical discussions or for practitioners – in order to make it possible to address with use of available datasets. Below, we present the methods and results of the studies on the most commonly investigated topics: determinants of campaigns' successes, the impact of spatial proximity, the relevance of social network, non-profit orientation. Finally, we present a study related to the detection of fraudulent behavior as an example of the new approach to the platforms' data.

A few years ago, Mollick (2014, p. 1) claimed that, despite the growing amount of money invested through crowdfunding, our knowledge about the dynamics of successful campaigns remains very limited. Mollick's exploratory study (2014) is among the first that provided the audience with the data-backed confirmation or refutation of some intuitive beliefs about campaign dynamics. Mollick uses logistic regression of the odds of successful funding on a large dataset (48,524 Kickstarter projects, 2009–2012). He frames crowdfunding campaigns as a special case of fundraising entrepreneurial ventures and asks the question often explored in the context of venture capital: how investors act when they only have partial information. Specifically, Mollick asks to what extent do signals of quality play a role in crowdfunding, if we take into account how backers' profiles differ from those of traditional investors. For that reason, apart from using such independent variables available in Kickstarter's database as (financial) project goal, funding level, the number of backers, and other, he also creatively opera-

tionalizes the projects' quality. After Chen et al. (2009), Mollick assumes that preparedness signals quality and he measures it using the following indicators: 1) presence of a video pitch; 2) updates within three days; 3) lack of spelling errors. Mollick finds from this operationalization that projects signaling higher quality are more likely to receive funding. Moreover, large numbers of contacts in online social networks correlate with success. Furthermore, Mollick claims that – similarly to traditionally-funded entrepreneurial ventures – geography plays a role in successful crowdfunding, even in a sample limited to projects from the USA. The study also confirms the fact often indicated by followers of crowdfunding platforms' – that successful projects in most of the cases achieve their goals by narrow margins, while not successful fail by large amounts (p. 2). Finally, Mollick looks beyond the projects' financial goals and asks the question whether the project owners managed to fulfill their promises in time. Here, however, he must move beyond downloadable datasets and use manual coding (see more below).

As determinants of campaigns' success are among the most often investigated topics in platforms-centered approach, a growing number of studies allows us to check how often results reappear across different samples and populations of projects and platforms. Most of Mollick's results are confirmed by Cordova and colleagues (2015), who offer a similar study on a different sample; 1127 technology-related projects from four reward-based platforms: Kickstarter, Ulule, Eppela, and Idiegogo (2012–2013). However, contrary to Mollick's report, they observe that a project duration increases the chances of success. Moreover, they claim there is no significant impact of signals of quality, operationalized with a pitch video and systematic updates about the projects' development. Studies of smaller samples (e.g., Frydrych et al., 2014) claim, among others, that campaigns' duration has no significant impact, and that lower financial goal raises the chances for success. They also observe that as the visual pitch becomes a standard, it does not raise a projects' success chances anymore. Studies on a similar topic also appeared for equity-based platforms (Lukkarinen et al., 2016; Ahlers, 2015).

To sum up, the studies regarding the projects' chances of success with the use of big data provide some replicable but limited insights. The question arises, can they offer more fine-grained insights? Mollick (2014) suggests a number of future directions of inquiry, most of them unexplored on a satisfactory level until today. First, he draws attention to the potential differences in selection criteria between CF and other channels of fundraising, suggesting that the differences may result in new entrepreneurial ideas. Thus, the question here is: are projects funded through crowdfunding really different from those funded through traditional means? Second, Mollick recommends research on the extent to which CF enables the expression of online communities' innovative

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abilities. Finally, he points out that CF provides interesting material for researchers of early-stage enterprises because it gives a rare access to both failed and successful projects. Cordova et al. (2015) stress different unanswered questions; they note that there is a number of very successful projects, for which they were unable to capture satisfactory part of variance. That is, they over-perform despite average values of variables included in regression models. They suggest the key significance of other important factors, some of which are capturable through qualitative analysis, such as the specific niche of the projects or organizational form of the endeavor. In other words, the capture of significant factors determining campaigns' success may demand the inclusion of other variables than those provided by the platforms' architecture. This way, Cordova and colleagues signal the limitation not only of their study but of the selected methodological approach. Thus, the suggested directions of further research often demand the application of additional data and methods, beyond numeric data retrieved from the platform.

The impact of spatial or cultural proximity between entrepreneurs and their funders is another subject of investigation. These investigations contribute to the discussion on whether crowdfunding really opens new possibilities for actors outside of the centers of capital. That is, is it now possible that a great idea presented by a person from the periphery, with limited access to venture capital, will gain support through crowdfunding? Current studies suggest that – not necessarily.

Agrawal and colleagues (2011; 2015) first investigated this problem on a limited sample of successful music projects on the platform SellaBand. The authors identify 34 successful campaigns (out of 4712 attempts) which raised 50,000 USD or more in order to make a music album. Then, after analyzing the geographic location of both musicians and their supporters, the researchers observe that the average distance between the artists and backers is about 3000 miles. They interpret it as a sign of the reduced role of spatial proximity in comparison to traditional channels of fundraising. However, they also discover that, in the initial stage of a crowdfunding campaign, funds come mainly from supporters located in close proximity to the artists. They interpret it as support from people who likely have a personal connection to the artists: the "family and friends" who are frequently pointed out as the key resource for entrepreneurs in crowdfunding guidebooks (e.g., Lawton and Marom, 2013). However, considering the specific industry and small sample used in the study, this phenomenon certainly demands more scrutiny.

Lin and Viswanathan (2016) investigated an issue like spatial proximity, but slightly differently conceptualized – as "home bias." They focus on a lending platform, Prosper.com.

They apply a dyadic analysis of state affiliations of borrowers and lenders, including the mobility-related decisions of the platform users and their impact on the chances to obtain the loan, as well as the "natural experiment" effect resulting from the temporary change of rules on the platform. From this data, they establish that home bias does exist and it cannot be explained either by pure economic reasons – such as expected higher payoff – or by F&F (family&friends) support, as in the SellaBand case. The authors refer to the feelings of attachment to one's state and neighbors, defined by them as behavioral reasons.

Zheng and colleagues (2015) focused on another important aspect of platform-centered studies signaled above: the significance of social networks. The authors introduce the theory of multidimensional social capital, which is to consists of structural, relational, and cognitive dimensions. They operationalize a structural dimension as the number of ties in social media networks, relational dimension as obligation resulting from the reciprocity principle – measured by the number of projects supported by the fundraising entrepreneur – and cognitive dimension as shared meaning, measured by the length of the description of a campaign. What is interesting, they compare 515 Kickstarter projects with 270 projects from one of the leading reward-based Chinese platforms, Demohour. Unfortunately, they do not elaborate the method of the projects' selection from both databases; it does not seem random but rather biased toward successful projects, as the ratio of pledge over goal amounts to 1.05 for Kickstarter projects and 0.96 for Demohour projects (p. 492). From the analysis of this sample, the authors confirm their hypotheses. They find that a high score on all three dimensions has significant effects on crowdfunding performance in both countries. Furthermore, the effects are stronger on the Chinese platform, what the authors interpret with the concept of *Guanxi*. The effort to develop a theory behind crowdfunding research, drawing on the theories of social capital and intercultural comparisons, should be further explored as CF is now a global phenomenon. At the same time, the lack of clarity about the sampling method calls for a replication of the study, possibly with a greater number of platforms from different regions of the world. Surprisingly, such comparative studies are still uncommon.

Other topics covered with the same methodological approach are: questions about the impact of non-profit / sustainable / environmental orientation on the probability of campaigns' success (with mixed evidences; Pitschner nad Pitschner-Finn 2014; Horisch 2015); or, the timeliness of reward delivery (Hauge and Chimahusky, 2016) which concludes that it cannot be predicted basing on the available data.

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Siering and co-authors (2016) established a different approach to analyzing crowdfunding data. They use machine learning methods to develop and test a fraud detection mechanism. The mechanism aims at distinguishing fraudulent and nonfraudulent CF projects based on linguistic and content-based cues presented in the static and dynamic campaigns' communication. The dataset included 652 Kickstarter projects; 326 of which had previously been classified as fraudulent and consequently suspended by Kickstarter's integrity team on the grounds of violating the platform's terms of use. The other 326 projects were randomly selected from among all other Kickstarter projects. The authors extract and operate on the dynamic (discussions, updates, FAQ sections) and static (project description) communication related to each project. Next, they define a set of linguistic and content-based cues based on the set of psychological, cognitive, communication, and linguistic theories. In the following step, the textual data undergo pre-processing and division into subsets in order to make it usable by machine learning tools. Applied machine learning tools include support vector machines (SVM), neural networks, naive Bayes classifiers, k-nearest neighbors, decision trees and, in the last step, ensembles of classifiers. In the last step, the authors perform the evaluation of the machine learning results. Their final results are promising, as the highest accuracy of machine learning model reaches 79,75%.

To conclude, the studies based on the analysis of big data from Kickstarter or other platforms deliver a body of evidence regarding campaign dynamics. However, in some cases, due to the difference of samples and sampling methods, operationalization, and different methods of statistical analysis, the results are incoherent or even contradictory. Thus, the one should question the generalizability often claimed by the authors. Such a large number of distributed studies calls for a synthesis in the form of comparative studies, which would bring conclusive evidence. There is also a need for more systematic comparisons between platform types, between platforms in different countries, and in time. However, such data are not easily available. Moreover, to deepen our understanding of the increasingly complex and heterogeneous world of crowdfunding, we need studies that will ask how different platforms' settings impact campaigns' outcomes; studies in which the platform is the unit of analysis instead of the single campaign.

The approach that uses machine learning to analyze big data from crowdfunding platforms is still rare, but the first results are very promising. As demonstrated by Siering et alia, new techniques show the way beyond most popular questions about the impact of limited variables on the campaign dynamics.

Another important issue comes down to the level of theoretical sophistication of analyses. Reliance on the data from CF leaves analysts with a limited number of variables,

such as funding goals, number of backers, number of updates, or length of the campaigns' descriptions. Then, the feature as the length of campaigns' descriptions is interpreted as indicators of legitimacy (Frydrych et al., 2014); shared meaning (Zheng et al., 2015), or quality (Mollick, 2014). However, one may ask if such simple variables are valid indicators of more complex theoretical concepts. To overcome this problem, some researchers decide to apply more work-intensive approach and operationalize data using manual coding. As this modification brings new possibilities and new limitation, we propose to consider it as a specific sub-type of platform-centered studies.

Quantitative analysis of data after manual coding

Manual coding of data retrieved from platforms allows broadening the number of variables at the researchers' disposal. It may be used in support of big data analyses. For example, Mollick (2014) conducted part of his analysis with the use of manual coding. Two coders analyzed 471 projects from the Design and Technology category in order to establish whether the project owners managed to deliver promised rewards to the backers. This approach allowed to determine that a significant overfund raises the risk of delays in rewards delivery, probably due to the larger complexity of the enterprise.

Chen and colleagues (2016) provided an interesting example of how manual coding broadens the understanding of crowdfunding dynamics. The authors use advertising and donation literature to propose a number of factors which may influence CF success: (1) appeal modes: guilt appeals, self-benefit and others-benefit appeals, nostalgia appeals; (2) product type and message frames: utilitarian or hedonic project, rational or emotional message frames; (3) presentation characteristics: the length of video and textual pitches, types of images, the level of professionalism, the number of rewards. As the analysis of these factors required work-intensive coding, researchers limited the size of the random stratified sample to 200 projects from Kickstarter from 2013. They established that the following factors are significantly and positively related to funding levels: guilt appeals, utilitarian product types, emotional message frame. Additionally, supporters prefer a smaller number of reward categories. Other variables had no significant impact, including the length of video and text, professional image, and valence of the image. These findings may help potential crowdfunding users to design successful campaigns. The authors point out that future studies should treat crowdfunding marketing even more holistically and include the entrepreneurs' activity in social media during the pre-launch period, identified as the key action by many guidebooks for entrepreneurs. They suggest multi-platform research design, stressing that the process occurring on crowdfunding platforms is connected to activities in other corners of digital space. To the best of our knowledge, this suggestion is yet to be applied by other researchers.

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Calic and Mosakowski (2016) used coding to determine whether projects with a strong social or environmental orientation have higher chances to meet their funding goals. They selected a random sample of 707 Kickstarter campaigns from the Technology and Film/Video categories. Moreover, apart from data analysis provided by the platform, they hired coders to evaluate the projects' sustainability, orientation, and creativity, as well as to control variables: technical quality, project complexity, aesthetic appeal, and project complexity. The authors conclude that sustainability orientation positively affects funding success of crowdfunding projects, but this relationship is partially mediated by the project's creativity and third-party endorsements.

The examples above prove that the use of manual coding addresses some of the limitations of the first type of approach. It allows researchers to broaden the number and diversity of the analyzed variables, thus offering a more fine-grained analysis. It also gives an opportunity to better ground the study in theory, as in the case of Chen and co-authors (2016). However, it significantly raises the amount of workload needed to conduct such study and lowers the size of the sample, demanding from researchers to apply a sampling scheme, in opposition to the previous approach, when the number of records can be as high as hundreds of thousands. Despite the limited size of the samples, these studies are rarely replicated, what makes it difficult to claim their generalizability across regions and types of platforms.

Qualitative analysis of campaigns

The third and rarest approach to platform-centered studies relies on the dominance of qualitative analysis. The study of Manning and Bejarano (2017) signals the benefits of the qualitative approach. The authors were interested in the variation of narrative structures of entrepreneurial stories presented on campaigns' websites, especially the interlink of project histories and potential futures. In search of an answer, they apply an inductive multi-case study design: they analyzed a sample of 54 campaigns (videos and text from the websites supported by interviews with project owners)[9] set on Kickstarter between 2012 and 2015, representing each of the funding categories, with targets higher then 5.000$. Using a multi-staged inductive coding, they identify two fundamental narrative frames. First is the narration of an ongoing journey, which presents the project's past as a development process and its future as a long-term vision of the project's influence on the society at large, which formulates an emotional appeal. Second is the narration of result-in-progress which presents the project as an accomplishment and its future as a series of next steps (focus on short-term objectives) linked

[9] Despite the fact that researchers created new data (interviews data), we still analyzed their study as platform-centered; we do it as the presented research approach does not use interviews as an important basis for the study's conclusions.

with a call for support. The latter narrative employs transactional appeal. While the former is more typical of projects characterized by intangible outcomes, the use of simple technology, and strong social orientation, the latter is typical of projects with a commercial orientation, tangible outcomes, and advanced technology. The authors claim that the use of narrative styles moderate effect of other factors influencing campaigns' successes (p. 22). What specifically may lower the chances of entrepreneurs' success is the lack of coherence or mismatch between project type and the employed narration.

As the crowdfunding platforms create a new type of space for marketing communication, there certainly is room for more analysis of its specific features. Qualitative analysis appears appropriate for this goal. For example, we have little insight into the impact of communication between the backers and owners for the project dynamics or success. Moreover, the broader questions remain underinvestigated; among others, how crowdfunding's narrations mirror and construct discourses on technology, capitalism, and socio-technological futures (Brown and Michael, 2003). Thus, there is a number of topics which may be convincingly covered with the use of platform-centered qualitative analysis and, for instance, tools of discourse analysis (cf. Wodak and Meyer, 2009).

To conclude, platform-centered studies are most suitable for the analysis of campaign dynamics. Different methods of data gathering and analysis shed light on different aspects. In comparison to the approach based on the analysis of variables from the platform, manual coding opens possibilities to include more variables and better ground studies in theoretical discussions.

Regardless of the differences in data analysis methods between the three identified sub-types above, the main limitation of studies, in which crowdfunding platforms are both the source of topics and data, is inability to investigate the relationship between actions on the platforms and their impact on the world beyond; that is, the unfeasibility to study the intersection of "digital" and "real" layers of reality and their mutual interactions (cf. Stasik, 2017). As long as we exclusively rely on platform-retrieved data, crowdfunding remains a universe of its own and not a part of larger systems and networks. If we are interested in these interactions, we have to use different methodological approaches, often more complicated and resource-intensive. Platform-centered studies will hardly offer findings relevant to a broader conversation on the impact of digital revolution on business and social life. The two approaches below address these limitations by considering the relation between crowdfunding and the legal/institutional environment (3.3.) or its impact on practices such particular areas (3.4.) as sustainable projects or artistic production.

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Crowdfunding in context: statistics and secondary data

Platform-centered studies are invaluable sources of knowledge about campaign dynamics, but they are ineffective in answering the broader questions about trends in global crowdfunding or the impact of regulation on crowdfunding development across countries, regions, industries, and platform types. To answer these questions, one needs to analyze the available statistics and review regulations, often applying an international comparative perspective. The authors of industry reports or policy papers for descriptive purposes often use this approach (cf. The European Crowdfunding Network AISBL 2014; Wardrop et al., 2015; European Commission, 2016; CrowdfundingHub, 2016), which may also be the basis for academic papers with more explanatory goals. Here, the authors not only rely on available statistics but also create new data during their own research about, for instance, the number of platforms functioning in a country. For example, Dushnitsky and co-authors (2016) analyze various determinants of platform creation across EU-15 countries. They consider both general population statistics – such as the number of residents, the number of Internet users, or GDP per capita – and the data about the number of platforms of different types. Next, they build a model explaining the popularity of specific platform types across the researched countries.

Another example of this type of study is the analysis of regulations in a state (Silver and Kharti, 2016; Schwartz, 2015; Torkanovsky, 2016), often performed with the attempt to explain the dynamics of crowdfunding development and create recommendations for decision-makers and stakeholders.

These methodologies do not differ from other studies on regulations issued by scholars from the fields of law and public policy. The studies present crowdfunding as an element of broader innovation/financial ecosystem and as a factor in the national or regional economy. The methodological challenge specific to crowdfunding lies in the abovementioned (2.1) problem of data dispersed through platforms and their performance. For example, the study of Dushnitsky et al. (2016) misses information about the amount of capital collected over the years. Thus, to build a complete and exhaustive database of regional (e.g., European or Asian) crowdfunding platforms calls for new interesting research directions (p. 57). Another important direction is the combination of platform-centered studies and their interest in campaign dynamics with the study of regulatory and institutional environment typical for studies based on the analysis of statistics and regulations. For example, in some contexts, the successful crowdfunding campaigns may serve as a step to gain attention and support of business angels; in other contexts, where venture capital is scarce, that may be much more difficult. To analyze these connections, one must integrate both abovementioned methodological approaches.

Despite the fact that policy-oriented studies enable us to follow relations between institutional environment and crowdfunding development, they help not when one needs to understand how crowdfunding impacts particular businesses or social practices, such as energy projects or journalism. Therefore, we would need studies mixing the knowledge about crowdfunding and the impacted areas.

Crowdfunding and the worlds beyond: case studies and multi-sited studies

The third approach to study crowdfunding is least popular and often more resource-intensive. It draws from the tradition of qualitative field research and involves interactions with various actors engaged in crowdfunding. The actors include platforms operators, project owners, backers, and other concerned parties. In some examples, such research focuses solely on "non-virtual" activities, but it usually includes both the investigation of online platform activity and its real-life "backstage," effects and consequences. Referring to the tradition of ethnographic research, we call this last approach "multi-sited" as, similarly to the classic formulation, it relies on "tracing and describing the connections and relationships among sites previously thought incommensurate in ethnography's way of making arguments and providing its own contexts of significance" (Marcus, 1998, p. 14). Here, the "sites" that are too often studied separately, on the one hand, concentrate on actions observed on the platforms and, on the other hand, focus on their far-reaching consequences for actors, who decide to use the new possibilities offered by crowdfunding. Thus, the question is no longer limited to the internal dynamics of the process – as in the case of platform-centered studies – or the macro-level mechanisms applied in policy studies, but encompasses the consequences of "crowdfunding revolution" for the actors from a very particular area, such as sustainability-related initiatives, innovation development, journalism, or science.

Here, we discuss the studies focused on the intertwining of the crowdfunding and the practices in the following areas: sustainability-related projects, journalism, and artistic projects. These examples allow us to understand how crowdfunding may change the established domains – e.g. causing transformation of professional identities, or offering new possibilities for regions struggling with the lack of basic infrastructure. This, in turn, provides important context for the conclusions reached with different approaches.

For example, we have seen that platform-centered studies often discuss the issue of the impact of sustainability orientation on the chances of campaigns' success. Thus, the questions worth asking concern the impact of crowdfunded sustainable projects. Royal and Sampath S. Windsor (2014) conducted a case study of telecenters in Sri

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Lanka. They performed an analysis of archival data, interviews, and focus group in order to identify valid sources of sustainable finance for the initiative. The authors identify community lending as a promising approach, assuring more independence and resilience in comparison to the reliance on donors' funds, as this traditional solution too often leads to the collapse of the centers after funders' withdrawal. The article represents the type of study in which authors are not interested in crowdfunding as such: their focus is on options of sustainable funding for a specific initiative. However, during the research process, they identify crowdfunding as a solution to the problem and possible game-changer in the field of sustainable projects funding. In the same vein, Vasileiadou and co-authors (2015) investigated the potential of crowdfunding platforms for clean energy projects in the Netherlands, basing on the data provided online by platform operators, secondary data, and expert interviews. Here, again, the goal of the study was to assess the potential impact of new funding mechanism on the established field of green energy investment.

Journalism is another area potentially impacted by crowdfunding. Based on fifteen interviews with community members and ethnographic observation conducted at Spot.Us., an influential journalism platform in the USA functioning between 2008 and 2013, Aitamurto (2011) offered a case study focused on the impact of CF on journalism. Aitamurto focuses on the issues of interactions, transparency, motivation, and identity of journalists and donors, as well as the participatory culture created around the platform. She concludes that CF process demands from journalists to rebuild their professional role and identity in order to be able to run a successful campaign; for example, some of them "felt almost like begging" (p. 434) when asking for donation in their social network; they had difficulties merging their professional journalist identity with that of a "salesperson" (p. 434). Based on the donors' interviews, Aitamurto also states that the primary donors' motivation was rather altruistic than instrumental: they wanted to contribute to the common good and social change.

Although the Spot.Us platform no longer functions, Aitamurto's results may be potentially transferable to crowdfunding platforms such as Kickstarter, where journalism projects are on the rise (Vogt and Mitchell, 2016), or Polish crowdfunding platform Patronite.pl, in which artists, journalists and other representatives of creative professions may look for financial support to develop their activity. It also clearly shows the advantages of a case study based on qualitative methods. It enables the researcher to perform an in-depth analysis of changes in the professional identity and donor-author relationship, with insight into the campaigns' backstage. Journalists' anxiety and unease with crowdfunding, expressed during the research interviews, is indecipherable from video pitches; to be able to offer the account of participants' experience, researchers

have to confront the representations of campaigns with off-the-record reflections of their participants.

Artistic production was among the first areas transformed by crowdfunding; thus, there is a number of studies devoted to its impact. For example, Gałuszka and Brzozowska (2017) investigated the relations between project initiators and contributors in equity-based crowdfunding, reflecting on the role of fans/supporters: does crowdfunding offer them empowerment in their relation to the artists or exploit them? They collected data about the mechanism of platforms' operations and supplemented it with face-to-face and email interviews with both artists and contributors. While doing so, they did not limit themselves to the campaigns' analysis but tried to grasp the consequences of this mechanism for artists, artistic production, and their new supporters. Interestingly, they observe that real creative collaboration between artists and engaged fans is scarce.

While these studies focused on the consequences of crowdfunding for particular areas, Hui, Greenberg, and Gerber (2014) investigated the other end of the crowdfunding activity. They studied the necessary conditions that have to be met to make crowdfunding work; that is, the "collaborative efforts and day-to-day activities of crowdfunding users to design and improve crowdfunding support tools" (p. 62). Using data from forty-seven interviews with project creators from three platforms, they asked questions about the role and nature of distributed work of online communities in crowdfunding. The authors showed how the tasks of preparing, testing, publicizing, following through, and reciprocating are supported by the community.

To conclude, the qualitative field studies offer important insights in two main topics: 1) the changing nature of work and collaboration brought about by crowdfunding; and 2) the impact of crowdfunding on a particular area, such as investment in green technology infrastructures. Their empirical findings feed important theoretical discussions about these areas. However, these studies are still very rare, especially those adapting multi-sited approach, which simultaneously consider online and offline dimensions of crowdfunding and theorize on the mutual impact of these layers of social reality. A number of other areas impacted by crowdfunding – beginning with the entrepreneurial activity – has not been investigated with the use of qualitative methods at all.

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Concluding discussion

The review of methodological approaches employed to study crowdfunding confirms the interdisciplinarity and emerging transdisciplinarity of this research area. Although the review is neither exhaustive nor representative in statistical meaning of the term, we trust that it grasps the methodological plurality currently employed in the field of crowdfunding studies. We proposed to distinguish three main approaches with several sub-types and presented the main techniques of data gathering and analysis, as well as the main findings of each type of the research. We also presented how different approaches may complement each other, which may allow overcoming the limitation inherent in each of them.

We devoted most of our attention to the platform-centered studies as this research approach is the most specific for crowdfunding and similar phenomena. Here, crowdfunding serves not only as the main topic of the studies but also the source of research questions and data. Thus, the studies typically focus on the problems of campaign dynamics and solely stem from data retrieved from the website. They can provide meaningful insights, but the necessity to operate on a limited number of variables limits the scope of questions to be potentially answered with this approach. The most promising future research directions are as follows: 1) comparative studies of platform dynamics across countries, regions and platform types conducted to confirm the recent findings across more diversified and representative samples; 2) explorations of datasets with more sophisticated machine learning techniques; 3) theory-driven studies based on quantitative analysis of coded variables; 4) qualitative studies of new communication techniques developed for crowdfunding, including the dynamics of backers-project owners communication.

However, to understand the connections or impact of crowdfunding on other domains of activity, researchers must obtain external data and mix their studies of platforms with the studies of other phenomena. Here, the two other types of methodological approach are more useful. Studies based on secondary data, mainly statistics and regulations, allow understanding how crowdfunding development is connected to its institutional environment. As this area still very dynamically evolves, the challenge remains in providing an up-to-date description of the current crowdfunding landscape. A comprehensive and regularly updated database of crowdfunding initiatives, as postulated by Dushnitsky and co-authors (2016), would greatly advance the macro-level analysis. Also, studies of regulatory and institutional context may be merged with studies relying on data from platforms in order to better understand how the rules of the game impact the behavior of platform owners, entrepreneurs, and backers.

Finally, the studies employing fieldwork techniques seek to understand the meaning of "crowdfunding revolution" for involved parties. We mean here such studies as interviews or observations applied to get additional data related to the conditions or impacts of crowdfunding on particular fields of business and social activity. The design of such studies may include both the analysis of materials shared on the platforms and the "backstage" of the campaigns organizations or its consequences for given parties, from supporters through project owners to platforms operators. As proven by other studies of digital platforms from Couchsurfing (Mikołajewska-Zając, 2016; 2017) to Twitter (Rodak, 2017), this type of study has a very high potential to advance the theoretical discussion on the changing nature of work, creativity, and organizational boundaries in the era of digital cooperation. We believe that its wider adoption may deepen our understanding of social and business consequences of the "crowdfunding revolution."

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