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REVIEW

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Crowdsourcing in business and management disciplines: an integrative literature review

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Abstract

The objective of this study is to review crowdsourcing literature of the business and management disciplines and to know its relation with the open innovation concept. A systematic literature review is used in this study. Studies on crowdsourcing are published mostly in recent years, 2011–2013. Studies are highly dispersed, published in a very wide range of journals and are mostly based on a single case as data source. Content analysis of the findings of articles are performed to synthesize the findings in the extant literature. Most of the qualitative articles used single case method and most of the quantitative studies relied on online survey over a single crowdsourcing platform. Studies and scholars in the literature are from a limited number of countries. Although crowdsourcing as a concept overlaps with the open innovation concept, by no means, it can be considered a concept under the broad umbrella of open innovation concept. Based on identified gaps, future research avenues are presented.

Keywords: Crowdsourcing; Open innovation; Idea competition; Idea generation; Online communities; User innovation

Introduction

Crowdsourcing is one of several hot topics which have emerged in the last decade. The crowdsourcing concept is coined by Howe (2006) and defined as follows: “crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call”.

Crowdsourcing is an emerging topic and it has received great attention from scholars and practitioners. It overlaps with other contemporary concepts such as open innovation, collaborative innovation, and user innovation. Some scholars believe that it falls under the umbrella concept of open innovation (Ebner et al. 2009; Marjanovic et al. 2012; Wikhamn and Wikhamn 2013). However, crowdsourcing had not been considered to be a part of the open innovation concept when it was introduced by Chesbrough (2003). A study by Estellés-Arolas and González-Ladrón-de-Guevara (2012) found at least 40 definitions of crowdsourcing in the literature. What is crowdsourcing and what is not is an ongoing debate (Stieger et al. 2012). Studies on crowdsourcing are dispersed in various disciplines including business and management (B&M) disciplines.

An integrative literature review approach is used to integrate confusion and contradictory evidence that are existed in the extant literature. On the Web of Science database, for example, crowdsourcing literature is dispersed over a hundred research areas. Thus, crowdsourcing has emerged as a research topic for the scholars of many disciplines. It is used for various purposes such as collecting, mapping, and sharing data (Hudson-Smith et al. 2009), getting ideas and opinions from employees (Stieger et al. 2012), idea generation and decision making (Hossain 2012; Rosen 2011), microtasking (Alonso and Mizzaro 2012; Chandler and Kapelner 2013), and creativity (Cabiddu et al. 2013; Hossain and Kauranen 2015), among others.

Saxton et al. (2013) developed a taxonomic theory of crowdsourcing and found nine distinct forms of crowdsourcing models. Crowdsourcing has been classified in various categories. Boudreau and Lakhani (2013) classified crowdsourcing into four categories such as contests, collaborative communities, complementors, and micro tasking. Considering structural properties, nature of collaboration, and governance of various types of crowdsourcing networks, Simula and Ahola (2014) also classified crowdsourcing into four categories such as internal crowdsourcing, community crowdsourcing, open crowdsourcing, and crowdsourcing via a broker.

Zhao and Zhu (2014) contributed a review study on crowdsourcing within Information Systems discipline and identified various avenues for future studies. Many issues related with crowdsourcing are yet to be explored and reviews of crowdsourcing studies are crucial to gain comprehensive knowledge on it. How crowdsourcing literature in B&M disciplines are involving and how it is related with the open innovation concept are yet to be explored. Hence, the objective of this study is to review crowdsourcing literature of the B&M disciplines and to know its relation with the open innovation concept.

Review method

The Web of Science database is considered as the main source for articles. We used concurrently both “crowdsourcing” and “open innovation” as keywords to search articles. On the Web of Science database, articles are classified into various categories. We selected two categories – business and management – to extract articles on crowdsourcing which have been published under those two disciplines. We extracted all articles under B&M disciplines, which contain both crowdsourcing and open innovation terms. Altogether 49 articles have been found through our search on the Web of Science database. However, after reading all articles, 42 are included for analysis and other seven articles left out for their irrelevancy. To include more articles, we searched on the Scopus database and found additional seven articles. We searched on Google scholar and found one more article. Thus, 50 articles have been finally considered for this study purpose. Moreover, articles appeared in top-tier outlets on crowdfunding are additionally considered. Web of Science Core Collection is considered as the source of articles.

Based on methodologies, the articles are categorized into conceptual, qualitative, quantitative, mixed and managerial categories. A conceptual article focuses primarily on theory development and does not present data and/or analyses for the purposes of theory testing (Yadav 2010). We have categorized an article into conceptual group using the above criterion. An article is included in the qualitative group if it contains

qualitative data and analysis. An article is considered as a quantitative when clear quantitative data collection process and quantitative analysis are present in that article. If an article used both quantitative and qualitative data and analysis, we included it in the category of mixed method (see Creswell 2013). An article is considered as a managerial when its focus is clearly towards practitioners even though qualitative and quantitative data and analysis, to some extent, are present in the article.

We recorded necessary information on spreadsheet. The information mainly includes names of the authors, affiliation of authors by country, years of publication, names of journals, methodologies, data, types of samples, main aims of the studies, and key findings, among others. The categories are selected based on the inspiration from an article by Short et al. (2010). The study by Short et al. (2010) categorized articles in categories such as conceptual, empirical - qualitative, empirical – quantitative to content analysis.

All articles are read and necessary contents are extracted and analyzed to understand the overall development of this field. Thus, content analysis is performed to synthesize the findings of the articles. Content analysis means ‘the objective, systematic and quantitative description of the manifest content of communication’ (Berelson 1952:18). Content analysis describes a family of analytical approaches ranging from intuitive, interpretive analyses to systematic, strict textual analysis (Rosengren 1981).

To find how crowdsourcing as a concept is related with the open innovation concept, we recorded if the open innovation as a term is used in the title, abstract and list of keywords. If the open innovation concept is mentioned anywhere of the above places, we considered that in those articles crowdsourcing concept is perceived as highly related concept with the open innovation concept. On the other hand, if open innovation is only mentioned somewhere in the main body of an article, we considered low relation of crowdsourcing with the open innovation concept. If open innovation is not mentioned anywhere of an entire article, we considered no relation between these two concepts.

The trends in crowdsourcing literature

Figure 1 shows number of articles published over time, 2008–2013. The publication of articles on crowdsourcing under B&M disciplines started with only one article from 2008 even though the crowdsourcing concept was coined in 2006. In the last three years, 2011 – 2013, crowdsourcing as a field of study attracted significant attention from the scholars of B&M disciplines. In Fig. 1, two articles have published in advance in 2014 are excluded to have full year account of 48 articles from 2008 to 2013.

Table 1 lists number of publications by journals. Altogether 50 articles have been published in 40 journals of which 33 journals published only one article each. Only two journals have published three articles each and five journals have published two articles each. It is well-evident from the Table 1 that the crowdsourcing literature in the B&M disciplines is highly dispersed and no journal has played any significant role for the advancement of the crowdsourcing literature.

Figure 2 demonstrates the distribution of authors by country. It consists of two categories namely “first author” and “all authors”. As expected, authors from the USA

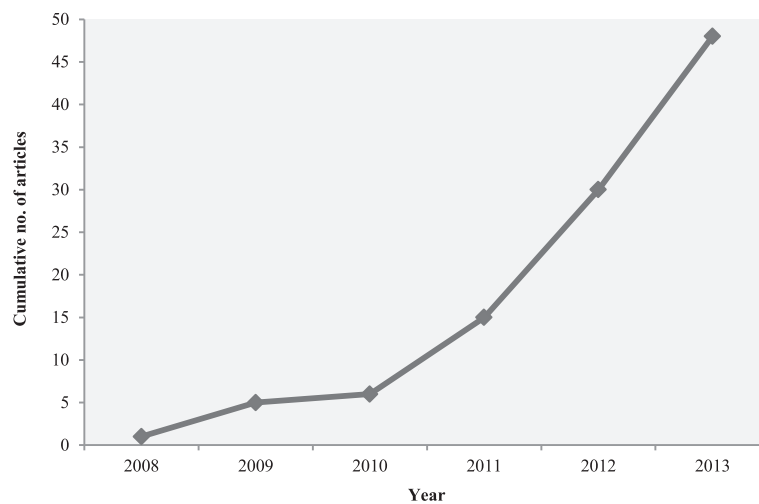


Fig. 1 Articles published on crowdsourcing in B&M discipline over time

have played a significant role in advancing the crowdsourcing literature. Articles are published by authors from 19 countries. Authors from Italy, UK, Austria, China, Denmark and Switzerland have outperformed authors of countries which are usually influential in research, such as Sweden and Germany. However, Germany has significant contribution in the “all authors” category.

Table 1 List of journals and their numbers of published articles

Journal	#	Journal	#
Harvard Business Review	3	International Journal of Research in Marketing	1
Research-Technology Management	3	International Journal of Knowledge Management	1
Academy of Management Review	2	International Journal of Research in Marketing	1
Creativity and Innovation Management	2	Internet Research	1
Decision Support Systems	2	Journal of Management Information Systems	1
Organization Science	2	Journal of Marketing	1
Technological Forecasting and Social Change	2	Journal of Product Innovation Management	1
Academy of Management Perspectives	1	Journal of Technology Management & Innovation	1
Business Information Review	1	Long Range Planning	1
California Management Review	1	M@n@gement	1
Computers, Environment and Urban Systems	1	Management Decision	1
Decision Analysis	1	Management Research Review	1
Electron Markets	1	Management Science	1
Expert Systems with Applications	1	Marketing Science	1
Industrial Marketing Management	1	MIS Quarterly	1
Information Systems and e-Business Management	1	MIS Quarterly Executive	1
Innovation: Management, Policy & Practice	1	MIT Sloan Management Review	1
International Journal of Electronic Commerce	1	R&D Management	1
International Journal of Innovation Management	1	Science and Public Policy	1
International Journal of Knowledge Management	1	The Innovation Journal: The Public Sector	1
		Innovation Journal	1

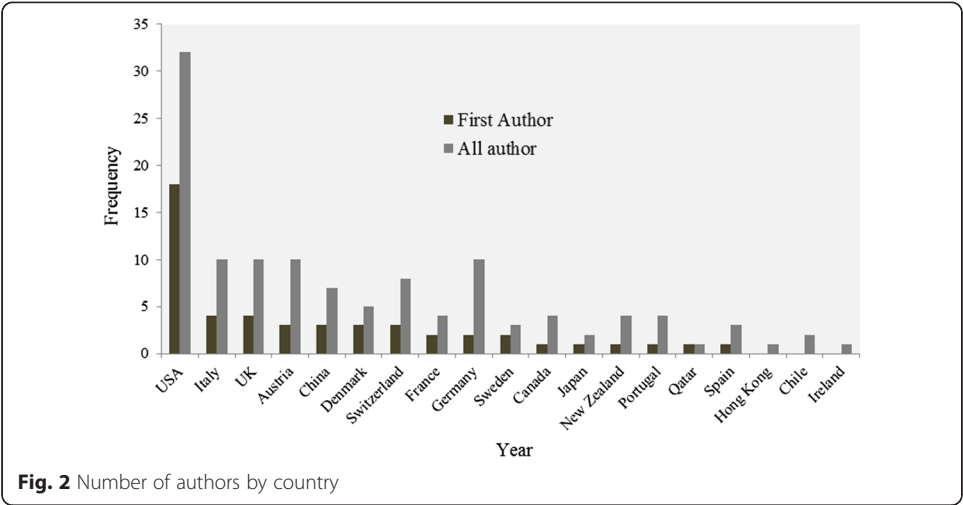
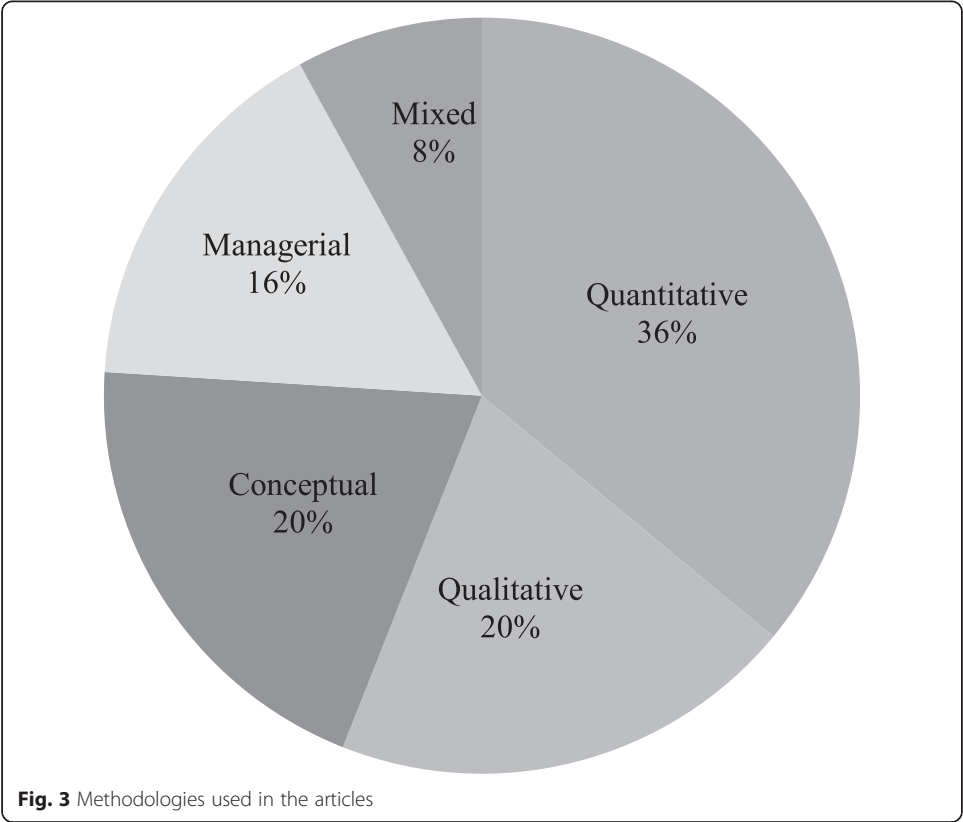


Figure 3 shows the distribution of methodologies used in the literature. We divided articles into categories such as conceptual, qualitative, quantitative, mixed and managerial categories. Methodologies used in the articles apparently are well-distributed. A large number of articles have been published in the empirical category. Articles in other categories such as conceptual and managerial have also been published at a reasonable extent. We have found 10 conceptual, 10 qualitative, 18 quantitative, 4 mixed method and 8 managerial articles.



As mentioned in the methodology part, we have made an attempt to understand if crowdsourcing concept is a part of open innovation in B&M disciplines. We found that in 20 articles (40 %), open innovation is mentioned in the title, abstract or list of keyword (high relation) whereas 29 articles (58 %) include the open innovation in the main body of the articles (Table 2). So, 29 articles are under the category of low relation whereas there is no relation of crowdsourcing with open innovation in 21 articles. At least in the B&M disciplines where open innovation concept mainly falls in, crowdsourcing concept has overlap with the open innovation concept.

Reviews

Content analysis of all 50 articles is conducted to understand the overall portrait of literature. Conceptual articles are analyzed to understand the overall development of various concepts followed by empirical articles (qualitative, quantitative, and mixed). The articles with managerial focus are analyzed to explore contributions of articles specifically for practitioners even though all articles may contain managerial discussions to some extent.

Conceptual studies

We found 10 conceptual articles in the literature (Table 3). These articles played a pivotal role in theory development on crowdsourcing. Afuah and Tucci (2012) argued that under certain circumstances crowdsourcing transforms distant search into local search. Hence, crowdsourcing is better than internal and contractual search for solving some problems. Avenali et al. (2013) believed that voluntary and legally enforceable agreements, proper evaluation of intellectual property rights, and detailing of economic and technical issues are necessary to induce collaboration between seekers and solvers. Crowdsourcing is useful for problem solving but it is not suitable for capturing value (Bloodgood 2013). However, Afuah and Tucci (2013) dismiss the fundamental issue raised by Bloodgood (2013) and demonstrate how crowdsourcing can be used to capture value. Crowdsourcing seems to be suitable for both value creation and value capture.

Bogers and West (2012) provided a framework for the strategic management of distribution innovation. Garrigos-Simon et al. (2012) demonstrated the impact of social networks and Web 3.0 technology to improve competitive advantage of organizations. Conceptualizing the open innovation for design competitions, Lampel et al. (2012) examined the architecture and governance of design competitions and explore how open innovation and crowdsourcing transforms design competitions. Rationale for Marketing Scholarship 2.0 – a more digital, collaborative approach for marketing knowledge production is getting significant (Lutz 2011).

Some scholars consider crowdsourcing as an under-researched type of open innovation (Marjanovic et al. 2012). Researchers and organizations can leverage from

Table 2 Proximity of crowdsourcing to open innovation concept

"Open innovation" mentioned at	Yes	No
Title, abstract, or list of keywords of an article	20	30
Main body of an article	29	21

Table 3 Summary of the conceptual studies

Study	Key findings
Afuah and Tucci (2012)	Under certain situations crowdsourcing transforms distant search into local search, improving the efficiency and effectiveness of problem solving.
Avenali et al. (2013)	The value of the open contract based challenge mechanism lies in its usefulness as a tool to promote collective innovation by supporting IPR management and knowledge negotiation.
Bloodgood (2013)	Crowdsourcing is good for problem solving but value capturing is missing.
Bogers and West (2012)	Contrast the predictions of perspectives on the sources, motivation, and value appropriation of external innovation; propose a framework for the strategic management of distributed innovation.
Garrigos-Simon, et al. (2012)	Possible of competitive advantages open to organizations in terms of recent innovations, and highlights the development that need to implement to improve decision management process and exploit new situations.
Lampel et al. (2012)	The evolution of design competitions and highlights their expanding scope and complexity.
Lutz (2011)	The value of Marketing Scholarships 2.0
Marjanovic et al. (2012)	Who is crowdsourcing and how. Diversity, core features and variables of various crowdsourcing models.
Olson and Rosacker (2013)	Find which researchers and organizations can leverage crowdsourcing and open source software.
Wikhamn and Wikhamn (2013)	Find how various concepts such as toolkits, innovation contests, crowdsourcing, and innovation intermediaries under the umbrella of open innovation are interrelated.

crowdsourcing and open source software concepts (Olson and Rosacker 2013). Wikhamn and Wikhamn (2013) introduced an integrated framework for open innovation and showed how, under the umbrella of open innovation, various concepts such as toolkits, innovation contests, crowdsourcing, and innovation intermediaries are interrelated. Thus, we have found that several conceptual articles have considered crowdsourcing as a part of the open innovation concept.

Qualitative studies

Table 4 provides a list of 10 qualitative articles. Five of these articles have used single crowdsourcing platform as the data source. Open business model leads to develop a multi-level incentive model (Chanal and Caron-Fasan 2010). A study by Battistella and Nonino (2012) argue that as the phase moves from foresight to design stage, the more extrinsic motivation is used whereas intrinsic motivation alone is rarely used. Monetary incentive is the most motivational factor on crowdsourcing platforms. Crowdsourcing can be used even in case of small number of crowds (Bojin et al. 2011).

Cummings et al. (2013) suggest that crowdsourcing is a new strategic possibility for research and development (R&D) organizations to complement their internal competencies. Djelassi and Decoopman (2013) found that the crowdsourcing affects the elements of existing business models and marketing functions of firms. The authors believed that crowdsourcing offers benefits for both firms and customers. It is apparent that crowdsourcing is useful for firms in many ways.

Franzoni and Sauermann (2014) highlighted the heterogeneity of crowd in crowd science and showed how crowd science is different from other knowledge production regimes such as innovation contest and traditional science. The value of social media

Table 4 Summary of the qualitative studies

Study	Sample	Key findings
Battistella and Nonino (2012)	116 platforms	Design of motivational system needs to consider the different stages of the innovation process. Open innovation platforms moving from work place logic to social place logic is necessary.
Bojin et al. (2011)	A case platform	Design of a crowdsourcing model even for small collection of individuals is proven to be feasible.
Chanal and Caron-Fasan (2010)	A case platform	The open business model on online communities requires a multi-level incentive model.
Cummings et al. (2013)	A case platform	Benefits of crowdsourcing for R&D problems rather than solutions were identified, including generating a potential pipeline of projects and clients as well as avoiding the challenge to the professional status of the organization's research capability.
Djelassi and Decoopman (2013)	Five cases	Propose a model to show the interrelations between different components of a business model and the interactions between firms and their customers. Crowdsourcing benefits both firms and their customers.
Franzoni and Sauermann (2014)	Three cases	Find the heterogeneity concerning what crowd science projects deal and how they are organized. Identifies two fundamental elements that characterize crowd science projects – open participation and open sharing of intermediate inputs.
Lampe et al. (2011)	A case platform	Social media projects designed to interact with the public can be initiated with reasonable expectations. Implementation of such projects is difficult due to limitations imposed namely by social, technical and task dependencies.
Mortara et al. (2013)	Six interviews	The success of idea competitions as an acquisition mechanism remains uncertain because their output is often lower compared to the required input.
Schweitzer et al. (2012)	218 ideas from an idea competition and 52 ideas from focus groups	Idea competitions lead to more and better ideas at a lower cost while focus groups yield richer interactions with users.
Weeks and Veltri (2013)	A case platform	Highlights elements that enhance and impair knowledge creation in a voluntary crowdsourcing community.

to engage with various stakeholders such as policy makers, government officials, and residents for the greater good of a society is significant (Lampe et al. 2011).

The success of idea competitions as a mechanism for acquiring ideas is challenging because very few ideas are selected from a huge pool of ideas submitted on crowdsourcing platforms (Mortara et al. 2013). However, idea competition brings some benefits such as improved intelligence and public relations. Comparing 218 ideas from an idea competition with 52 ideas from focus groups, Schweitzer et al. (2012) found that idea competition yields more ideas with lower cost per idea than focus groups which yield, however, richer interaction with users.

Idea competition is a valuable option to generate ideas with limited costs (Weeks and Veltri 2013). However, idea screening to find promising ideas from a large pool of ideas is a major barrier for organization to use idea competition. It seems that idea competition and information sharing on online forums are increasingly growing as parts of crowdsourcing.

Quantitative studies

Table 5 includes a list of 18 quantitative articles. In most of these articles, online survey over single crowdsourcing platform is used for data collection. Studying Dell's IdeaStorm community, Bayus (2013) found that serial ideators submit more valuable ideas than single ideators but serial ideators are unlikely to repeat their earlier success once their ideas are implemented. Moreover, crowds' twitter messages can help in disaster management situation (Castillo et al. 2013). Using a case study on human classification scenario, Costa et al. (2013) proposed an active learning framework which allows non-expert classification performed by crowds.

Extracting data of Haiti earthquake, Crooks and Wise (2013) proposed a model that can potentially help to link socio-cultural information about the people affected with relevant humanitarian relief organizations whereas Dalal et al. (2011) proposed a model for eliciting expert opinions. Ebner et al. (2009) presented an integrated concept of online idea competitions for leveraging the potential of crowds in a real-world setting.

Based on two experimental simulations, Franke et al. (2013) found that fairness expectations with regard to the distribution of value between firms and contributors impact the likelihood of participation of crowd in idea generation activities beyond the considerations of self-interest. Monetary rewards are positively related to non-substantial contributions (Frey et al. 2011). In turn, non-monetary rewards lead to more substantial postings. Using machine learning techniques, Ghose et al. (2012) proposed a random coefficient hybrid structural model for hotel ranking considering user behavior on social media and search engines. Based on two experiments over a crowdsourcing platform, a study by Karvetski et al. (2013) argued that multiple related individual forecasts can be useful to improve aggregation of probabilities.

Successful implementation and maintenance of idea competition is important for the development of promising ideas (Leimeister et al. 2009). Levine and Prietula (2014) found that open collaboration is useful even in unforgiving environments: when cooperators are a minority, free riders are present, diversity is low, and goods are rival. Muhdi and Boutellier (2011) compared between an online Swiss innovation intermediary community and an off-line internal innovation community. They found that both monetary and non-monetary rewards are top motivators in the intermediary community whereas options such as Webcam, chat function, connection with other social networks platform are low motivators in both communities. A study by Poetz and Schreier (2012) compared ideas generated by a firm's professionals with those generated by users; ideas generated by users score significantly higher in novelty and customer benefit, and somewhat lower in feasibility than those generated by professionals.

Schumaker (2013) developed a prediction system based on machine learning techniques. The author found that within the domain of harness racing, the prediction system outperforms crowds and other existing systems. Exploring an idea competition platform in China, Shao et al. (2012) found that higher reward, longer duration and lower intensity of competition lead to engage higher number of solvers; in contrary, higher reward, longer duration, and higher level of task difficulty result in higher level of winners' ability.

Both extrinsic and intrinsic motivations have significant influence for sustained participation intention (Sun et al. 2012). A negative interaction affects extrinsic motivation whereas positive interaction affects intrinsic motivation and both negative interaction

Table 5 Summary of the studies based on quantitative method

Study	Sample	Key findings
Bayus (2013)	348 implemented ideas of 8801 submitted ideas by 4285 individuals	Only few of abundant submitted ideas are implemented and most of the implemented ideas are proposed by serial ideators whereas new ideators are less successful to become serial ideators.
Castillo et al. (2013)	780 clusters of microblog messages	There are measurable differences in the way microblog message propagates. These differences are related to newsworthiness and credibility of the information conveyed. Features of messages makes effective for of information veracity.
Costa et al. (2013)	600 000 web comments	Propose a framework to demonstrate experimentally that non-experts classification performed by crowds to define user profile.
Crooks and Wise (2013)	GIS data of Haiti earthquake	The proposed model can potentially provide a link between socio-cultural information about the people affected and human relief organizations.
Dalal et al. (2011)	Data from an online survey on a platform	Provides conceptually why the proposed model is an appropriate model for eliciting expert opinions, and illustrates main components by using an infrastructure investment.
Ebner et al. (2009)	A single case	The search and identification of topics of an idea competition need to be broad to attract numerous participants. The incentive structure needs to be attractive for the participants and appropriate for firms.
Franke et al. (2013)	743 samples	External contributors to firm innovation are not exclusively driven by fairness considerations. Expectations of distributive and procedural fairness impact rules underlying a crowdsourcing system.
Frey et al. (2011)	104 samples from an online survey on a platform	Monetary incentive tends to be positively related to making non-substantial contribution, whereas non-monetary incentive tends to breed more substantial postings.
Ghose et al. (2012)	8099 samples from online sources	Highlights how social media can be mined and incorporated in a model to generate a hotel ranking system based on average utility gain a consumer receives from a particular hotel.
Karvetski et al. (2013)	Data from two events	Establish a model that can be used to remedy that occurs when forecasters use the probability that represents epistemic uncertainty.
Leimeister et al. (2009)	32 samples from an online survey on a platform	Find optimal incentive and motivation for an online idea competition.
Levine and Prietula (2014)	Various agents of a collaboration innovation	Open collaboration performs well even in harsh environments including cooperators are a minority, free riders are present, and lacking of diversity.
Muhdi and Boutellier (2011)	117 samples from online survey of two platforms	Find 16 significant differences between the perceptions of members of the two investigated innovation communities.
Poetz and Schreier (2012)	Experiment data of 51 professional and 52 user ideas	User generated ideas score significantly higher in novelty and customer benefit, and somewhat lower in feasibility.
Schumaker (2013)	91 testing races covering 770 testing cases.	A race history maximizes system accuracy and payout. An informational inequality exists within the harness racing market
Shao et al. (2012)	2524 projects of a crowdsourcing platform	Higher awards, easier tasks, longer duration and lower competition intensity lead to a higher number of solvers. Higher awards, longer duration and higher difficulty level of tasks lead to higher ability level of winners.

Table 5 Summary of the studies based on quantitative method (*Continued*)

Sun et al. (2012)	205 samples of an online survey from a platform	Negative interaction effect between extrinsic motivation and task complexity, and positive interaction effect between intrinsic motivation and self-efficacy.
Zheng et al. (2011)	283 samples of an online survey from a platform	Intrinsic motivation is more important than extrinsic motivation to induce participation. Contest autonomy, variety, and analyzability are positively associated with intrinsic motivation, whereas contest tacitness was negatively associated with intrinsic motivation.

and positive interaction affect task complexity. Zheng et al. (2011) argue that intrinsic motivation is more important than extrinsic motivation to induce crowds for participation. They believed that a balance of both extrinsic and intrinsic motivation is necessary to encourage participation in crowdsourcing.

They also found that contest autonomy variety and analyzability are positively associated with intrinsic motivation, whereas contest tacitness is negatively associated with intrinsic motivation.

Studies based on mixed method

Only four articles used mixed method (Table 6). Considering 13 expert interviews and 207 responses of a survey, Agerfalk and Fitzgerald (2008) contributed one of the earliest insights into the broader crowdsourcing concept. They identified some tension points on which customer and community perceptions tend to differ. They found that openness, trust, tact, professionalism, transparency, and complementariness are key factors to build an overall opensourcing ecosystem. Analyzing 26 platforms, Battistella and Nonio (2013) revealed that despite monetary rewards, the open innovation platforms depend on different motivations to attract different motivation roles. Champions and expert roles are attracted to OIPs that actively support knowledge acquisition, sharing or creation. On the other hand, relationship roles are attracted in OIPs that serve as locus where open communities are formed. Process roles are attracted in OIPs that actively support innovation process.

Hutter et al. (2011) explored a community based design competition using the data from the OSRAM LED design contest which took place in 2009. The data of this study included over 1890 evaluations and 3285 comments made by participants. Qualitative

Table 6 Summary of the studies based on mixed method

Study	Sample	Key findings
Agerfalk and Fitzgerald (2008)	13 interviews & 207 response from an online survey	Openness, trust, tact, professionalism, transparency, and complementariness are the keys factors to build an overall open sourcing ecosystem.
Battistella and Nonio (2013)	26 platforms	Champion and expert roles are attracted to that support knowledge acquisition, sharing or creation. Relationship roles are attracted as part of community. Process roles are attracted to OIPs that support innovation process.
Hutter et al. (2011)	541 ideas from an idea competition	The firm-level concept of co-opetition may be relevant for an innovation's success on the individual level with contest communities.
Nishikawa et al. (2013)	Interviews and secondary data for network analysis	User-generated products generally contain higher novelty, outperformed their designer-generated counterparts on key market performance metrics.

part includes content analysis of the context of behavior in the community. Quantitative analysis was based on social network analysis. Subsequently, both qualitative and quantitative analyses are combined to verify, confirm and refine their findings. The authors found that the firm-level concept of co-opetition can be pertinent for the success of an innovation in the individual level of contest communities. Analyzing six user-generated products with 37 designer-generated products of Muji, Nishikawa et al. (2013) found that user-generated products have higher novelty than designer-generated products. Furthermore, on some key market performance metrics, user-generated products outperformed designer-generated products.

Managerial studies

Eight articles were published with managerial focus (Table 7). Even though some of them contain both qualitative and quantitative data and analysis, the focus of the studies is towards managers; hence we considered them under managerial group. Blohm et al. (2013) showed how firms can build the absorptive capacity – firms' ability to sense, value, assimilate, and apply new knowledge – to capture business value and to find possible ways to overcome challenges for implementing crowdsourcing. Bonabeau (2009) highlighted factors that are crucial to understand if collective intelligence leads to better decisions. To reap benefits from collective intelligence, they suggested that firms need to understand some essential issues such as balance between diversity and expertise, and decentralized and distributed decision making.

Table 7 Summary of the studies with managerial focus

Study	Sample	Key findings
Blohm et al. (2013)	14 expert interviews	Identifies the challenges of implementing crowdsourcing and shows how organizational leaders can build the necessary absorptive capacity to capture value from crowdsourced data.
Bonabeau (2009)	NA	Companies face far more challenges to search ideas outside of the traditional places. Although success looks simple, a complex underlying mechanism is required for harnessing the power of collective intelligence.
Boudreau and Lakhani (2013)	NA	Excluding crowdsourcing from corporate innovation strategy means losing opportunity. Managers resist crowdsourcing mainly because they are not clear enough what kinds of problems a crowd really can solve and how to manage the crowdsourcing process.
Healy and Ramanna (2013)	NA	Corrupt practice is less defensible in developing countries for multinationals in overseas. Citizen-driven initiative mitigates corruption.
Jouret (2009)	An idea competition	Harnessing wisdom of crowds needs much more than simply developing an online platform and putting up reward. It involves sheer labor and complexity.
Kaikati and Kaikati (2013)	NA	Provides guidelines for negotiating cashless marketplace exchange in some domains such as crowdsourcing, promotions, and word of mouth.
Lauto et al. (2013)	An idea competition	An idea competition process that asking participants to comments on proposals improves idea generation and screening and that active involvement of R&D managers in competition process is a key factor in idea competition.
Wagner (2011)	NA	By setting forth a credible but challenging goal with minimal hurdles to entry, prizes rally diverse approaches around a focused agenda, supporting an entire field of innovators rather than a single solution.

Boudreau and Lakhani (2013) showed that despite numerous success cases, only handful of firms are capable to use crowdsourcing effectively. They found that managers are typically reluctant to invite external people to solve internal problems and tend to avoid intellectual property dilemma involved in this process. To get fuller advantages from crowdsourcing, the authors urge firms to consider four approaches such as contests, collaborative communities, complementors, and labor market. Crowd fights against corruption, which business leaders no longer can ignore. Citing various cases from countries such as China, India, and Turkey along with an in-depth analysis of a movement called RosPil in Russia, Healy and Ramanna (2013) illustrated that the movements of crowds against corruption can benefit western firms to capture value from emerging countries.

From a hands-on experience, Jouret (2009) discovered that crowdsourcing is not so simple rather it requires much more than simply developing an online platform and putting up reward. Running an idea competition requires sheer labor and involves high complexity. Kaikati and Kaikati (2013) demonstrated cashless crowdsourcing models. They claimed that examples such as Wikipedia, Threadless – an online t-shirt selling firm, and Tختهagle – cell phone for micro tasking from emerging countries are well known examples of cashless crowdsourcing. Lauto et al. (2013) argued how online collaboration is a powerful means for idea generation in large firms. Based on an idea competition, they found that asking participants to comments on ideas improve idea generation and screening. They suggest that active involvement of R&D management is a key success factor in an idea competition. Organizations can use competitions to enhance R&D portfolio and engage user communities by embracing diverse risk-takers and investors (Wagner 2011).

Crowdfunding: a new emergent in crowdsourcing

From the above discussion we found that crowdsourcing is mainly used for creative crowdsourcing, microtasking, wisdom of the crowd, and idea contest. Recently, however, crowdsourcing has expanded to a new dimension called crowdfunding. In crowdfunding, crowds provide financial support to a project which needs funding to scale up. Articles on crowdfunding on top-tier journals started appearing from the beginning of 2014. According to Crowdfunding Industry Report (2015), crowdfunding can mainly be of the following categories: Donation based crowdfunding, equity based crowdfunding, lending based crowdfunding, reward based crowdfunding, and royalty based crowdfunding. Moreover, hybrid-based crowdfunding is also a considerable type of crowdfunding. The report also found that crowdfunding industry raised \$16.2 billion in 2014 as funding which is a 167 % increase over the \$6.1 billion raised in 2013 and the share of lending based crowdfunding is two-thirds (69 %) of the total fundraising. Crowdfunding is considered as a most recent research stream of the broad crowdsourcing discipline. Several journals have published special issues on crowdfunding. *Venture Capital* journal published the earliest special issue in 2013 followed by journals such as *Strategic Change*, *New Media & Society* and *Entrepreneurship Theory and Practice* in 2015. Thus, crowdfunding has received great attention of scholars, practitioners and policy makers. The empirical evidences of contributory studies (which are not many) on crowdfunding are summarized below. Studies indicate various research themes that need to consider in future research .

A study by Schwienbacher and Larralde (2012) demonstrated that the importance of crowdfunding as an alternative and viable source of funding is growing enormously. Burtch et al. (2013) empirically examined social influence in online journalism crowdfunding projects. They found two crucial results: (1) funders may experience a decrease in their marginal utility from their contributions and (2) the degree of exposure that a pitch receives during the funding process is positively related with readership of the story's publication. Mollick (2014) found that personal network and project quality are two pivotal issues for successful crowdfunding efforts. Moreover, he also found that project founders strive to fulfill their obligations to funders but overfunded projects are particularly vulnerable to delay in fulfilling obligations. Comparing between pre-ordering (reward) and profit sharing (equity) crowdfunding, Belleflamme et al. (2014) derived that profit sharing is optimal for entrepreneurs with large capital requirements; along with early capital raising, pre-ordering scheme helps founders to know the market potential of their products.

Agrawal et al. (2015) examined a crowdfunding platform that connects artists with funders. They found that despite the role of the Internet to reduce numerous distance-related frictions, local and distant funders possess different funding patterns. Local funders are less responsive to the figure of cumulative funds raised by an artist. Mollick and Nanda (2015) also studied an art project to understand how crowd differs from experts in judging which project to fund. They found that there are significant agreement in funding decision of crowds and experts. Thus, their findings suggest that crowds can be used as a complementary to experts for funding decision.

Using social capital theory and collecting data from China and the USA, Zheng et al. (2011) compared entrepreneurs' social network impact on crowdfunding. They found that entrepreneurs' social network ties, obligations to fund other entrepreneurs, and the common meaning of the crowdfunding project between an entrepreneur and sponsors have significant effects on crowdfunding performance in China and the USA. However, the predictive power of social capital is stronger in China than that in the USA and obligation has greater impact in China. Colombo et al. (2015) argue that the effect of internal social capital on the success of a campaign is fully mediated by the capital and backers collected in the campaign's early days. However, Ahlers et al. (2015) found that in equity crowdfunding both social capital and intellectual capital have little or no impact on funding success.

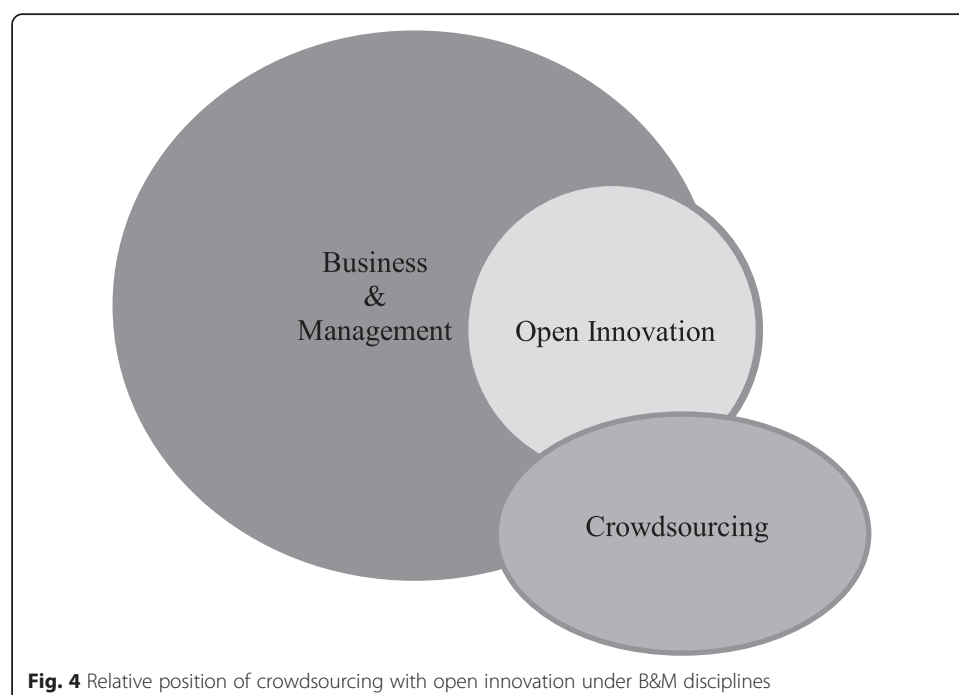
Using cognitive evaluation theory in micro-lending crowdfunding, Allison et al. (2015) revealed that lenders react positively to the narratives that highlights the venture as an opportunity to help others and less positive when the narrates are framed as a business opportunity. In the same vein, Belleflamme et al. (2013) argue that nonprofit organizations tend to be significantly more successful than for-profit organization in achieving their fundraising targets. A study by Cummings et al. (2013) explored equity crowdfunding in the context of Canada when equity crowdfunding was not in practice. It found that potential funders' perceived motivations for equity crowdfunding include finance, non-finance, diversification, networking, support, etc. However, the study indicates that non-financial motives have limited role in equity crowdfunding. In the same vein, Cholakova and Clarysse (2015) found that non-financial motives play no significant role in equity crowdfunding projects.

Studies on crowdfunding is still in nascent stage. Some conflicting results especially on venture quality such as human capital, social capital, and intellectual capital have appeared in the current studies. Crowdfunding as a research field and practice is evolving, institutional reforms are taking place and new (regulatory) challenges are emerging (Harrison 2013). However, one thing is clear that crowdfunding started as a promising field of research. It is expected to move from its current marginal stage to the mainstream research field.

Discussions

This is a review study on crowdsourcing in business and management disciplines. We found that crowdsourcing is not a concept under the umbrella of open innovation concept (Table 1), which some scholars hold. It can merely be claimed that crowdsourcing has overlaps with open innovation. Crowdsourcing as a concept falls partially under B&M disciplines. Figure 4 illustrates a tentative position of the crowdsourcing concept in relation with the open innovation concept under B&M disciplines. Crowdsourcing does not necessarily capture profit-oriented value whereas open innovation is fully considered as a profit oriented concept. In broader perspective, open innovation can be considered a concept under B&M disciplines whereas a small portion of crowdsourcing literature falls within B&M disciplines. Since the crowdsourcing concept has recently emerged in the B&M disciplines, various issues related with crowdsourcing are yet to emerge and many of the emerged issues are yet to pass the passage of rigorous empirical tests.

To adopt crowdsourcing as an activity, firms need to change their business models and strategies. However, how firms change their business models and strategies over a period of time is sparse. Although much research on crowdsourcing is



already accomplished, optimum mechanisms of various types of crowdsourcing are still limitedly known.

The evolution of crowdsourcing is documented in a huge pool of literature, which can be compiled together succinctly to understand the overall development of this field. The degree of necessary engagement and roles of top management throughout a crowdsourcing process are crucial but their roles in this regard are not well rounded.

Incentives to motivate participants to engage in crowdsourcing platforms are essential. What kinds of incentive trigger crowds to participate in a particular context is crucial to explore. Motivation depends on social context, education, age, and culture along with many other traits. How a particular crowdsourcing platform can structure its incentive to get best value is a challenging issue. Some individuals are motivated by monetary incentives whereas others are by non-monetary incentives. So, how to design an appropriate motivation structure to attract both kinds of individuals needs rigorous investigation.

Even though crowdsourcing has been proven as a promising choice for idea generation, its potential to capture value still remains under a great debate. Crowds offer ideas that they believe to have better solution based on their experiences whereas professionals of a firm generate ideas which should compile with resources and business strategy of firms. One popular manifestation of crowdsourcing is idea competition. However, when should firms go for idea competition and for what kind of problems (complex to simple) is an unanswered question in the literature.

How firms can trade-off between internal and external sources for innovation is a standing impasse for managers. Hence, motives of these two groups differ significantly. Professionals work under firms' management whereas crowds work staying outside the scope of firms' control boundary. Thus, traditional human resources frameworks are not applicable for crowd management. It is also necessary to explore implicit benefits of crowdsourcing such as marketing, public relation, intelligence, building long-term relation with participants, and probably most importantly shifting locus of cost of ideation from firms to crowds. Monetary incentives might be more relevant to attract crowds from low income regions. Insight into the optimum structures and processes to identify single or several best ideas from a large number of ideas is necessary. The knowledge regarding the degree of benefits for contributors in different types of crowdsourcing platforms is not well-grounded in the literature. Crowdsourcing in B&M disciplines is still in a nascent stage. Scholars need to engage actively to enrich this field.

Studies on crowdsourcing proliferated into various directions such as idea generation, microtasking, open source software, public participation, citizen science, citizen journalism, and wikies. However, crowdfunding is a more recently emerged research stream and it is appearing to become as an independent and mainstream research discipline.

Conclusion

This study provides an integrative review of the extant literature on crowdsourcing in business and management disciplines. Moreover, it established a relationship between crowdsourcing and open innovation concepts. Most of the articles on crowdsourcing

have been published in recent several years. It is found that articles on crowdsourcing appeared in wide range of outlets. Content analysis of the reviewed articles showed that qualitative studies are mostly based on single case study whereas the quantitative studies are based mainly on online survey over a single crowdsourcing platform. Although crowdsourcing as a concept overlaps with open innovation but it can be considered a concept under the broad umbrella of open innovation concept.

Competing interests

The author declares that he has no competing interests.

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