

Crowd-Innovation: Crowdsourcing Platforms for Innovation

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Abstract: Companies fostering innovation take advantage of an emergent combination of various factors such as the human brains, tools, networks, and technologies. Crowdsourcing platforms support all these elements together and offer quite an interesting tool for all the innovation phases, from idea creation to the market. Despite increasing utilization of these platforms, a systematic analysis of the supported type of services and contributions is missing. This work aims to analyze some of the most used crowdsourcing platforms and to classify them according to the type of contribution they may provide in the innovation process. Using an emerging approach analysis, the following contribution phases have been revealed: idea contests, ongoing idea platforms, platforms for idea screening, innovation platforms, R&D platforms, design contest platforms, ongoing design platforms, creative contests, and platforms for virtual concept testing. In this paper, these nine categories are described in depth to explain how they serve various phases of the innovation process: idea generation and testing; research and development of rough concepts, detailed concept and testing, production, and market launch.

1 INTRODUCTION

Conceptually in open innovation, any actor can take advantage of “*purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively*” (Chesbrough, 2006).

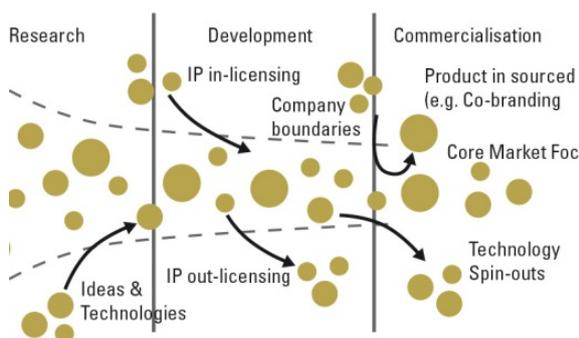


Figure 1: Open innovation model.

As depicted in Figure 1, R&D activity can be seen as an open system in which valuable ideas could come either from inside and/or outside the company (Chesbrough, 2003), and the boundaries

between the company and its periphery are therefore becoming more and more “porous” (Howe, 2008).

In coherence with this trend, networked information systems, distributed knowledge management procedures, e-commerce marketplaces, and crowdsourcing platforms are becoming mainstream. The term crowdsourcing was coined by Jeff Howe and Mark Robinson in 2006 and was the compound contraction of “crowd” and “outsourcing”.

In more detail:

“*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. This can take the form of peer-production (when the job is performed collaboratively), but it can also be undertaken by sole individuals. The crucial prerequisite of crowdsourcing is the use of the open call format and a large network of potential laborers*”. (Howe, 2006).

In addition, “*Crowdsourcing is the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an*

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undefined, generally large group of people in the form of an open call." and *"Crowdsourcing is the application of Open Source principles to fields outside of software."* (Howe, 2008)

Despite that crowdsourcing refers to the most recent internet-based network, various notable historical examples were grounded in this concept, for instance, the project supported by the London Philological Society to develop the Oxford English Dictionary. An open call was made and over a period of 70 years, more than 6 million submitted terms and definitions were obtained. (Winchester, 2003).

The crowdsourcing phenomenon is usually depicted as an actor (an individual or an organization) externalized in an activity (simple or complex) through an open call. The open call can be made through a corporate portal or an intermediary platform such as Amazon's Mechanical Turk, Innocentive, and Clickworker. The open call may refer to various forms of contributions: among others, a donation of money (crowdfunding); a provision of opinions and judgments (crowd-voting), and a donation of labor (crowd-creation). This latter can be organized as:

- **Microtasks:** a set of small, or even very small, well-defined simple tasks that together may comprise a large project/product. These tasks are performed by individuals who often autonomously contribute to validate data, tag images, provide simple content, translate phrases, etc.
- **Macrotasks:** more complex often not clearly defined activities, which usually require the involvement of teams. Macrotasks are suitable for research projects, product and service innovation in which the crowd is empowered to provide the best course of action to solve a complex problem.

In other words, Open Innovation is transformed into Crowd Innovation as depicted in Figure 2 (Boudreau and Lakhani, 2013).

Companies, then, may foster innovation via crowdsourcing in two ways: (i) developing a corporate platform (LEGO Ideas platform, Muji challenge, etc.) or (ii) using services provided by intermediary platforms, the so-called "innomediaries" (Sawhney et al., 2003; Palacios et al., 2016; Ghezzi et al., 2018).

More recent studies focus on the models of crowdsourced service for value co-creation (Haidong et al., 2019; Liu et al., 2018; Pera et al. 2016), and on the role of customers in co-creation

processes (de Mattos et al., 2018; Zhao et al., 2016). According to these studies, companies take advantage of a corporate crowdsourcing platform to acquire information from customers and other stakeholders who may provide very useful knowledge to the company. They gather, track, and share relevant industry trends to inspire the development of enriched ideas for the company's innovation program (Lorenzo-Romero & Constantinides, 2019).

In a more effective, accurate, rapid, and cheap way, crowdsourcing corporate platforms can also

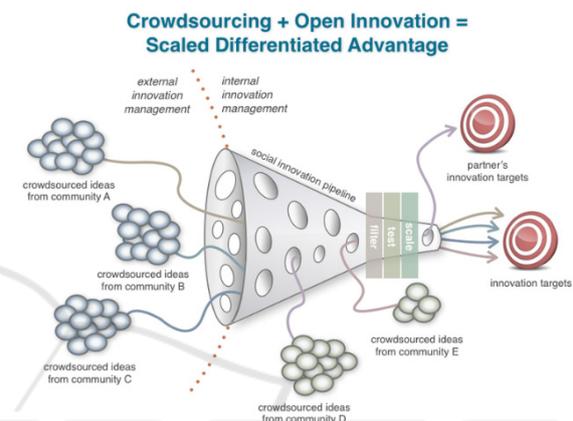


Figure 2: Crowd innovation model¹.

identify the biggest struggles of customers, end-users, and employees by involving them in the design thinking process in order to find meaningful patterns for ideation boosts. Moreover, these platforms can acquire information about the needs of customers and the most appropriate products and services that satisfy clients, and can also create a common technological base through which consumers gather together in a community (e.g., the famous case of MyStarbucks idea).

Companies can also involve large numbers of external ecosystem stakeholders (customers, business partners, expert communities, academia, start-ups & entrepreneurs, and even citizens) in an open collective intelligence initiative (Fedorenko & Berthon, 2017; Kohler & Nickel, 2017; de Mattos et al., 2018). In most cases, customers are intrinsically motivated to offer their innovative ideas for free as future users of those innovative products and services (von Hippel, 2005). Analyzing the contributions of the crowd can trace, evaluate, and manage scouting opportunities for technology usage, joint ventures, mergers, partnerships and

¹ source: <https://www.zdnet.com/blog/hinchcliffe>

acquisitions and become the leading ideal management solution for capturing the collective intelligence of employees in order to generate groundbreaking results and successfully compete on the market.

2 AIMS OF THE PAPER AND METHOD OF ANALYSIS

In the last few years, researchers have identified various elements that strongly affect the success of crowdsourcing initiatives, but little work has been done on how various crowdsourcing platforms influence company innovation process. The study proposed here is aimed at a systematic exploration of the most important crowdsourcing platforms, with the aim to identify the most common features and elements that support a company innovation process.

The analysis was conducted as follows:

- Literature review on crowdsourcing platforms and innovation.
- Identification of the most important crowdsourcing platform on innovation.
- Analysis of the crowdsourcing platforms and data collection.

Data were collected through a three-step process:

- Desk analysis: the initial collection of secondary data needed to frame the research work.
- Direct observation of the platform features.
- Semi-structured interviews. An interview protocol was developed to facilitate and guide semi-structured open-ended interviews. All the interviews were recorded, classified, and analyzed.

All the collected data were analyzed. To improve the reliability of the study (Merriam, 2009) the following actions was undertaken:

- Data triangulation of multiple sources of information.
- Saturation and continuous data collection to the point where more data added little to regularities that had already surfaced.
- Peer review, or consultation interviewing of expert crowdsourcing contributors and developers.

- Plausible alternatives, or the rationale for ruling out alternative explanations and accounting for discrepant (negative) cases.

Significant features and episodes emerged, and a common taxonomy was developed for innovation mechanisms and processes supported by the crowdsourcing platforms.

The taxonomy derives from a comparison between real cases of online platforms and the theoretical concept developed in the literature.

2.1 The Sample of Analysis

In the recent past, an increasing number of crowdsourcing platforms have been launched: Deloitte calculated more than three billion enterprise crowdsourcing platforms grouped as in Table 1 (Deloitte, 2016).

Table 1: Crowdsourcing platforms: a classification.

<i>Crowdsourcing models</i>	<i>Examples</i>
Crowd collaboration	99Designs X Prize Quirky
Crowd competition	TopCoder Kaggle InnoCentive Applause
Crowd labor (microtasks)	TaskRabbit Amazon’s Mech. Turk Streetbees Gigwalk Samasource
Crowd labor (mesotasks)	Lionbridge CrowdFlower
Crowd labor (macrotasks)	10EQS Wikistrat OnFrontiers Applause
Crowdfunding	Kickstarter CrowdCube
Crowd curation	Wikipedia TripAdvisor
User-generated content	YouTube iStockphoto

The above-mentioned platforms are classified according to the type of service they support as depicted in Table 2.

Table 2: Crowdsourcing platform services.

<i>Crowdsourcing models</i>	<i>Services</i>
Crowd collaboration	<ul style="list-style-type: none"> - Tasks requiring the aggregate 'wisdom of the crowd' - Generating outside ideas
Crowd competition	<ul style="list-style-type: none"> - Creating actionable solutions - Developing prototypes - Building a sense of community - Generating outside ideas - 'Gamification'
Crowd labor (microtasks)	<ul style="list-style-type: none"> - Well-defined, everyday tasks for individuals that require general skills only - On-site manual work, such as store restocking, furniture assembly and cleaning - Large crowds - Manpower when the company does not want to hire permanent employees or contractors - Real-time market intelligence or data gathering
Crowd labor (mesotasks)	<ul style="list-style-type: none"> - Well-defined tasks that require specialist processing skills - Routine but time-consuming activities, such as data entry - Manpower when the company does not want to hire permanent employees or contractors
Crowd labor (macrotasks)	<ul style="list-style-type: none"> - Poorly defined or unstructured tasks or problems, such as strategy development, research, or consulting - Tasks requiring subjective judgement or specialist skills - Manpower when the company does not want to hire permanent employees or contractors
Crowdfunding	<ul style="list-style-type: none"> - Fundraising - Start-ups
Crowd curation	<ul style="list-style-type: none"> - Building and sharing knowledge
User-generated content	<ul style="list-style-type: none"> - Building large content repositories

However, these traditional classifications do not shed light on how a company can be supported by crowdsourcing platforms in the process of

innovation (Ghezzi et al., 2018). As a result, ten well-known platforms for creativity and innovation were selected from the thousands available using the following criteria:

- platforms that deal with innovation
- platforms that have or will have a significant impact on the market
- industry-specific platform (where designers are involved)
- corporate platforms that deal with the company innovation process.

Generalist platforms were also studied to have a complete understanding of the innovation process. Some industry-specific platforms were analyzed to gain a more in-depth understanding of the first findings and then two corporate crowdsourcing platforms were examined to identify hypothetical differences between corporate and intermediary platforms.

The selected platforms are (Figure 3):

- InnoCentive (<https://www.innocentive.com/>)
- Idea storm (<http://www.ideastorm.com/>)
- 99 design (<https://99designs.it/>)
- Zooppa (<https://www.zooppa.com>)
- Slow/d (<http://slowd.it/>)

The industry-specific platforms are:

- Open Source Footwear (<https://www.fluevog.com>)
- Threadless (<https://www.threadless.com/>)
- Designhill (<https://www.designhill.com/>)

Corporate crowdsourcing platforms:

- P&GConnect+develop (www.pgconnectdevelop.com/)
- Heineken Ideas Brewery



Figure 3: A selection of crowdsourcing platforms.

A selection of crowdsourcing contributors and platform developers were interviewed to verify the findings of desk analysis.

2.2 Framework of Analysis and Interview Protocol

To carry out more objective observations, a framework of analysis was developed. This was also used as the interview protocol. The framework takes into consideration the following relevant elements:

- The set of activities a company can carry out on the platform (resources, call, timing, etc.).
- Mechanisms of interaction among contributors and between the requester (the company) and the provider (the contributor).
- The set of incentives a company can provide on the platform.
- The type of knowledge provided and shared on the platform.
- Mechanisms of social networking and connection with other social networks (LinkedIn, Facebook, etc.).
- The ID of the company and the contributors.

All the above-mentioned elements have a strong impact on the company inventions since they affect various innovation phases, the quality of the innovative ideas, the set of rewards that drive contributors to create content, and the set of incentives that spur users to participate. All these data were collected and analyzed to identify any common characteristics.

3 THEORETICAL, EMPIRICAL AND MANAGERIAL IMPLICATIONS AND CONTRIBUTIONS

From the structured analysis of collected data, the identified crowdsourcing platform functionalities, and the expert interviews a new taxonomy became apparent, and the following nine categories of crowdsourcing platforms for innovation emerged:

- idea contests,
- ongoing idea platforms,
- platforms for idea screening,
- innovation platforms,
- R&D platforms,

- design contest platforms,
- ongoing design platforms,
- creative contests, and
- platforms for virtual concept testing.

This classification is quite new because it does not intend to analyze only the platform features but to identify how the different features affect the innovation process and are perfectly suited to specific innovation phases of the innovation process: idea creation and testing; research, development and testing, production, and commercialization (summarized in Figure 4).

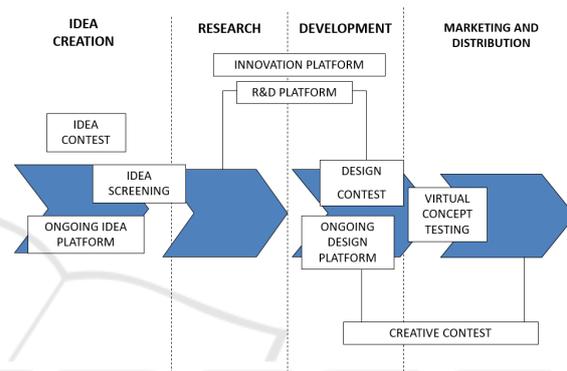


Figure 4: Crowdsourcing platforms and the innovation process.

In Section 3.1, the nine categories are fully described, examples of existing and used crowdsourcing platforms are provided and how they serve the various phases of the innovation process is explained. It will be quite clear that each category represents a different set of:

- types of contribution,
- decision processes, and
- incentives for the contributors.

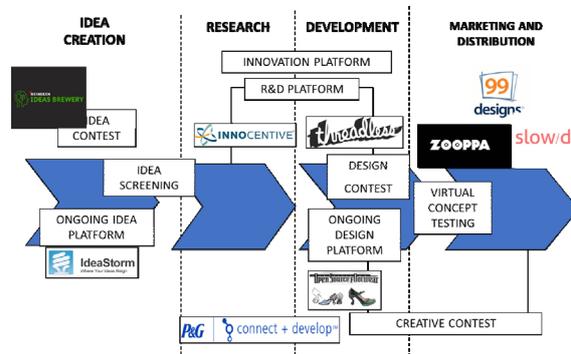


Figure 5: Crowdsourcing platforms and the innovation process: the sample of analysis.

3.1 Idea Creation/Generation

As is evident from Figure 5, the first phase of the innovation process consists of the generation of ideas. To engage the crowd in these very first moments, two approaches are possible: the creation of ongoing idea platforms or idea contests for organizations. Although they are both part of the idea creation phase, these two approaches are considered distinctive in order to highlight their characteristic operation mechanisms.

An idea contest constitutes a particular case of “innovation contest”, where “a firm (the seeker) facing an innovation-related problem [...] posts this problem to a population of independent agents (the solvers) and then provides an award to the agent that generated the best solution” (Terwiesch, Xu, 2008). The contest usually has a theme that should characterize contributions and a deadline for posting them online. In the case of an idea contest, the best ideas generated as a response to a certain input are rewarded usually by a monetary reward. The explicit reward contributes to further foster the self-selection mechanism underlying any crowdsourcing initiative (Piller, Walcher, 2006) and to raise the average quality of the ideas produced (Piller, Walcher, 2006). According to Piller and Walcher (2006), from this approach is possible to identify lead users that could be engaged in other phases of the innovation process in a better, cheaper, and more rapid way compared to other techniques.

Another important advantage of the approach in question is that the company pays only for contributions that it considers worthy of implementation or further development: this significantly reduces the risks of failures in the innovation process since the burden is on the contributors themselves (Terwiesch, Xu, 2008). An example of this approach is the Heineken platform called Ideas Brewery², where the company organizes idea contests to get creative ideas regarding strategic topics for future development.

By employing idea platforms, the company continuously/regularly collects innovative ideas for new products, services, or processes, or that could improve and integrate existing products, services, or processes (Bayus, 2013). Howe (2008) defines the approach under consideration as “idea jam”: it consists of an online brainstorming session that involves a huge and undefined number of participants. The request for contribution is rather generic and there is no fixed deadline for posting

ideas: the only requisite is to register on the website. Generally, no monetary incentives are provided (or those which are, are symbolic prizes) and the level of contributions will probably vary and, on average, not be that high.

The idea screening platform enables any user to vote and comment on different innovative ideas. As a result, it is determined what ideas, if further developed or directly implemented, would obtain positive feedback on the market. The examined platforms are usually integrated into the idea platforms described previously. The effort requested from the single individual is rather low but produces value is the final ranking resulting from the combination of the crowd actions (Howe, 2008).

3.2 Development

Considering the development phase of designs for new products, design contest platforms, and ongoing design platforms are considered different since they present a differentiated set of characteristics. More than in the idea(s) platforms, not only information about needs is requested but also how to practically satisfy those needs. In most cases the work of the crowd is rewarded with monetary incentives: therefore, the most used type of design platform is the contest approach. A design contest is based on the operational mechanism and incentives illustrated in the idea contest, but contributors are professionals and specialized workers, mainly motivated by the monetary prizes and by the possibility to gain visibility in the design industry and to sell their creations via websites.

Less common is the ongoing design platform approach where a company can continuously collect ideas for new designs using a corporate platform, request general ideas, and decide whether to implement them or not. An example of this kind of platform is that of the company Fluevog Shoes, Open Source Footwear³: this brand collects ideas for new designs of shoes and can decide which contributions are worthy of further development.

3.3 Marketing and Distribution

Even in the testing and selection phase of the best design proposal, a company can exploit the work of the crowd (Dahan, Srinivasan, 2000). In the case of virtual concept testing platforms, however, the engagement significance is even higher given the fact that the evaluation concerns proposals that are

² www.ideasbrewery.com

³ www.fluevog.com/community/opensource-footwear/

much closer to the launch on the market. As a result, it is possible to reduce the risks of the market launch of new products because the producer learns about customer preferences in a more direct and precise mode before the production starts and when the product is still in the concept phase (Ogawa, Piller, 2006). Ogawa and Piller (2006) call this approach "collective customer commitment": it consists of asking the clients to commit to buy a new product before starting the final phases of the development process and the production.

If the virtual testing mechanism concerns concepts internally developed by the company, these platforms become online concept labs and enable the testing of customer reactions to products that are still in the development phase (Sawhney et al., 2005). In this case, the customers have a role that is much closer to the traditional of final users and buyers (Piller, Ihl, 2009). Thanks to the evolution of rendering and simulation technologies, it is easier, cheaper, and quicker to generate prototypes so that it is possible to get many concepts tested in parallel (Dahan, Srinivasan, 2000). It is very important to engage with the company's customers in this phase because the customers could direct the company's supply.

4 CONCLUSIONS

The proposed taxonomy aims to present to the classification of online crowdsourcing platforms under a new perspective, namely which phase of the innovation process they could best serve.

From a scientific point of view this taxonomy can be used to improve the model of open innovation and of innovation ecosystem. The ecosystem can be characterized by both internal and external stakeholder crowdsourcing solutions, by corporate platforms and innomediaries. In other words, the crowd innovation model can be enriched with the innovation phases and the taxonomy identified in this research as depicted in Figure 6.

Referring to the managerial implications: the main advantage of this classification is to present an analysis by the innovation process thus helping companies to decide on what the most suitable crowdsourcing platform to use is. This allows a company, that wants to crowdsource part of its innovation process, to have a panoramic and organic view of the different existing possibilities.

The limit of this research is that the taxonomy proposed in the paper enables the researchers to classify crowdsourcing platforms according to the

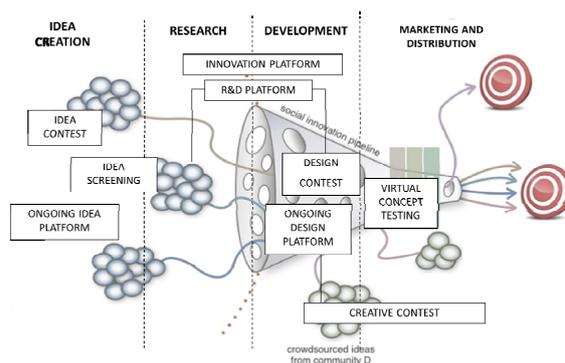


Figure 6: The new model of crowd innovation.

phases of the innovation process. However, not every platform could be easily allocated to a single category since they may offer more than one service, covering more than one phase of the innovation process.

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