Crowdsourcing Platforms: Objective, Activities and Motivation

Completed Research

Fernando Ressetti Vianna
Federal University of Technology - Paraná
fvianna2009@hotmail.com

Jurandir Peinado
Federal University of Technology - Paraná
jurandirpeinado@utfpr.edu.br

Alexandre Reis Graeml
Federal University of Technology - Paraná (UTFPR)
graeml@utfpr.edu.br

Abstract

This article analyzes the relationship that exists among the objectives of crowdsourcing platforms, the types of activities they demand from crowdsourcees and the incentives they provide to obtain collaboration. The 136 platforms that appeared in two previous SLRs carried out by the authors to categorize the types of activities performed and the motivation offered in crowdsourcing projects were separated in seven groups, according to the objective of the activities performed by the crowdsourcees. Microtask activities are present in over 40% of the platforms, showing that individuals may be motivated to collaborate, without developing commitment or even identification with the objectives of the promoting organization. The "financial reward" or the "love" factor is usually the prevailing motivation factor. However, those two factors tend to be mutually exclusive.

Keywords

Crowdsourcing, motivations, activities, objectives.

Introduction

The use of tools that integrate different actors involved with a process is transforming the way service providers and industries view their participation in value creation activities. Systems and environments are being developed with the focus on the joint participation of a group of interested individuals, which jointly generate a form of intelligence that would not occur if there were only the isolated actions of individuals (Chai *et al.*, 2017). Crowdsourcing platforms are among such environments and are used not only to generate knowledge, but also to foster other types of activities, such as the development of products and even the collection of individual perceptions, which represent relevant information for other individuals and organizations to base their decisions on (Kim *et al.*, 2018; Shiu and Lui, 2015).

The term crowdsourcing relates to the expansion of outsourcing activity, allowing organizations to seek solutions to problems by involving a group of externally connected individuals in an efficient way (Howe, 2005; Geiger *et al.,* 2011; Schenk and Guittard, 2011). The various possibilities of utilizing the knowledge of a crowd, through simple or complex individual aggregated efforts, or collectively coordinated ones, have been addressed in many previous works (e.g. Howe, 2005). Innovation in business modeling processes also occurs when crowdsourcing is introduced, which allows for several other complementary types of innovation that unleash when organizational boundaries are overcome (Hosseini *et al.,* 2015; Seltzer and Mahmoudi, 2013; Felin *et al.,* 2017).

The participation of individuals in crowdsourcing activities has also been the focus of different studies interested in understanding the form of participation, motivations and objectives (Malone *et al.,* 2010; Hosseini *et al.,* 2015). Among the factors that influence people's participation, recent studies focus on the types of activities being demanded, trying to classify them according to the form of involvement and the effort required from participants (Sivula and Kantola, 2015; Prpic *et al.,* 2015; Faber and Matthes, 2016). The types of demanded activities depend on factors such as the characteristics of the business that is carried out by the organization, the part of the work that will take place through the crowdsourcing effort, and the participants' interest in the project, its outcomes or what they will get in return (Hosseini *et al.,* 2015). There are also studies

that address the motivation factors that influence the participation in crowdsourcing, as well as varying classifications of these factors (Cupido and Ophoff, 2014; Brabham, 2010).

Despite all the previous studies on the types of crowdsourced activities and the incentives provided to people to participate in crowdsourcing efforts, no previous work was found that related the objectives of the crowdsourcer, the types of demanded activities and the motivation factors used to obtain collaboration. This represents an important research gap that we intend to bridge through our study, given that such understanding may significantly improve the efficiency of efforts toward obtaining the participation of larger groups of individuals in crowdsourcing projects.

Types of Crowdsourcing Activities

Different authors have been exploring the development of taxonomies to categorize the types of activities performed on crowdsourcing platforms. Through a Systematic Literature Review (SLR) developed by the authors of this paper in a previous study (Vianna, Peinado and Graeml, 2018), it was possible to identify the types of activities performed by means of crowdsourcing. The SLR is a methodology that allows the development of important advances on a theme, from a previously selected relevant literature (Xiao and Watson, 2019).

Google Scholar was used as the database from which the *corpus* of the SLR was selected. As a tool to define the *corpus* for a systematic review, Google Scholar had proved effective in previous works (Noruzi, 2005; Gehanno, Rollin and Darmoni, 2013). Caregnato (2011) explains the reason for Google Scholar to be so comprehensive and convenient to determine an SLR's *corpus*: most journal editors allow it to have access to the metadata of the papers in their journals, even when access to the full content is restricted. In many cases, other databases were required, later, to gain access to the full content of the papers to be reviewed.

The following combination of terms was used in the original search: "crowdsourcing" and "taxonomy" (words such as "classification" and "categorization" were also used). The results of the search were filtered down following good practices for SLRs (Padilha and Graeml, 2015) to ensure that the eleven finally selected papers were the right ones to be reviewed, including explicit classifications of the types of crowdsourcing activities.

Table 1 presents the types of crowdsourcing activities that were mapped and their main characteristics, according to the findings of the above mentioned previous systematic study.

Type of activity	Characteristics
Microtask	- Paid or unpaid work (Sivula and Kantola, 2015; Hossain and Kauranen, 2015); - Low remuneration, if available (Prpic *et al.,* 2015; Schuurman *et al.,* 2012; Schenk and Guittard, 2011); - Low involvement (Schenk and Guittard, 2011); - Large volume of individuals collaborating (Sivula and Kantola, 2015; Good and Su, 2013; Faber and Matthes, 2016; Schenk and Guittard, 2011); - Low complexity tasks (Sivula and Kantola, 2015; Schenk and Guittard, 2011; Schuurman *et al.,* 2012).
Competition	- Work rewarded by means of award to excellence (Prpic *et al.,* 2015; Majchrzak and Malhotra, 2013; Good and Su, 2013; Zogaj *et al.,* 2014); - Number of individuals involved vary, sometimes involving group work, other times representing sole work (Prpic *et al.,* 2015; Schuurman *et al.,* 2012); - Need for minimally specialized knowledge in the area of activity (Prpic *et al.,* 2015; Zogaj *et al.,* 2014; Nakatsu *et al.,* 2014); - Possibility of peer evaluation throughout the competition (Schuurman *et al.,* 2012).
Evaluation	- Paid or unpaid work (Sivula and Kantola, 2015; Saxton *et al.,* 2013; Nakatsu *et al.,* 2014); - Feedback from individuals regarding a specific product or service offered by an organization (Sivula and Kantola, 2015; Nakatsu *et al.,* 2014).
Complex task	- Work usually monetarily rewarded (Schenk and Guittard, 2011); - Troubleshooting difficult problems (Faber and Matthes, 2016; Schenk and Guittard, 2011); - Selection of work group with specific characteristics and knowledge (Sivula and Kantola, 2015; Schenk and Guittard, 2011); - Larger involvement and commitment of individuals (Faber and Matthes, 2016); - Collaboration as a response to specific calls on crowdsource platforms (Majchrzak and Malhotra, 2013).
Software development	- Work may be monetarily rewarded or not (Hossain and Kauranen, 2015); - Collaborative software development and improvement (Saxton *et al.,* 2013); - Need for specific knowledge (Hossain and Kauranen, 2015); - Individuals "motivated" by involvement with IT (Hossain and Kauranen, 2015).
Voting	- Work usually not monetarily rewarded, used internally to improve services provided by an organization (Sivula and Kantola, 2015);

Type of activity	Characteristics
	- Collective intelligence used to vote on topics on a platform (Faber and Matthes, 2016).
Knowledge dissemination	- Paid or unpaid work (Sivula and Kantola, 2015); - Organization uses the crowd to increase knowledge, through a new idea or diffusion of knowledge (Sivula and Kantola, 2015).
Open collaboration	- Usually unpaid work (Prpic *et al.,* 2015); - Use of social networks and intermediary platforms or wiki in search for solvers (Prpic *et al.,* 2015); - Problem or opportunity posted in IT media (Prpic *et al.,* 2015).
Sale	- Usually paid work, by means of a commission (Zogaj *et al.,* 2014); - Platform use the crowd as a sales enhancer (Zogaj *et al.,* 2014).
Collaboration intermediate	- Usually paid work (Saxton *et al.*, 2013); - Platform aims to serve as middleman between organizations and individuals willing to collaborate (Saxton *et al.*, 2013); - Medium or low levels of voluntary collaboration, but high returns guarantee (Saxton *et al.*, 2013).
Public project	- Usually unpaid or low-cost work (Hossain and Kauranen, 2015); - Public participation in public planning and public projects (Hossain and Kauranen, 2015); - Involvement of the citizen in the development of public policies, guaranteeing commitment on the part of the government (Hossain and Kauranen, 2015).
Citizen science	- Usually unpaid, voluntary work (Hossain and Kauranen, 2015); - Involvement in basic or highly sophisticated and complex activities (Hossain and Kauranen, 2015); - Usually the participation happens due to personal interest or curiosity, or to a sense of responsibility of the individual (Hossain and Kauranen, 2015); - Use of platforms in employee engagement (Hossain and Kauranen, 2015).
Sharing	- Provision of the service can be remunerated or not (Nakatsu *et al.,* 2014); - Sharing spaces, goods, services and knowledge (Nakatsu *et al.,* 2014).

Table 1: Types of Crowdsourcing Activities and their Characteristics.

Source: Vianna, Peinado and Graeml (2018).

Motivation Factors in Crowdsourcing

Individuals who participate in crowdsourcing projects collaborate for different reasons, which may go beyond the traditional financial incentives usually provided by organizations in exchange for work. There will be people willing to collaborate even with projects that do not offer any monetary return (Tran *et al.,* 2012). Glory and recognition for participation, or love for the project or its outcomes are reasons that also need to be considered (Malone *et al.*, 2010; Tran and Park, 2015).

The authors of this paper have also previously performed an extensive SLR on motivation factors that contribute to the participation in crowdsourcing (Vianna, Peinado and Graeml, 2017). Google Scholar was the database from which papers were selected also for such study, based on a search for "crowdsourcing" and "motivation". Similar procedures to those briefly described for the systematic review on the types of crowdsourcing activities were adopted, resulting in twenty journal papers to comprise the *corpus* of the study, which presented an explicit classification of motivation factors related to the performance of crowdsourcing activities.

Table 2 summarizes the results of such previous work, in which the authors were able to depict nine different categories of motivating factors, highlighting the expressions that were used by the original authors.

Motivation factor	Terminology used
Financial reward	- Money (Brabham, 2013; Zheng, Li and Hou, 2014) - Monetary return (Brabham, 2008; Borst, 2010; Zheng, Li and Hou, 2014); - Award (Leimeister *et al.*, 2009; Sukaini *et al.*, 2015); - Monetary motivation (Zhao and Zhu, 2014); - Financial incentives (Sukaini *et al.,* 2015); - Financial reward (Anthuan, Shoaib and Jooyoung, 2012; Tran and Park, 2015; Cupido and Ophoff, 2014; Soliman and Tuunainen, 2015) - Opportunity to make money (Brabham, 2010); - Payment (Vasantha, Corney and Smith, 2014).
Recognition/glory	- Obtaining recognition (Zeng, Li and Hou, 2014); - Reaction of others to participation (Leimeister *et al.*, 2009); - Perception of relevance by others (Leimeister *et al.*, 2009); - Glory (Zhao and Zhu, 2014); - Reputation (Tran and Park, 2015); - Publicity (Soliman and Tuunainen, 2015).

Motivation factor	Terminology used
Career opportunities	- Career (Leimeister *et al.*, 2009); - New opportunities within a given area (Leimeister *et al.*, 2009); - Improvement of labor prospects (Zhao and Zhu, 2014); - Portfolio development for future work (Brabham, 2013); - Professional reputation (Brabham, 2008); - Capture of services (Brabham, 2010).
Knowledge and skills development	- Access to knowledge (Leimeister *et al.*, 2009); - Skills development (Zhao and Zhu, 2014, Brabham, 2010; Hosseini *et al.*, 2015); - Learning (Gassenheimer, Siguaw and Hunter, 2013); - Possibility of teaching (Gassenheimer, Siguaw and Hunter, 2013); - Skills enhancement (Brabham, 2008); - Intellectual stimulation (Coleman, Georgiadou and Labonte, 2009; Bretschneider, Leimeister and Mathiassen, 2014); - Creativity (Brabham, 2013).
Relationship/ socializing	- Access to other users and mentors (Leimeister *et al.*, 2009); - Social identification (Zolkepli, Hasno and Mukhiar, 2015); - Sense of community (Coleman, Georgiadou and Labonte, 2009; - Sense of belonging; reciprocity (Cupido and Ophoff, 2014); - Social benefits (Kosonen *et al.,* 2014); - Development of relationships with other participants (Gassenheimer, Siguaw and Hunter, 2013); - Social presence (Sukaini *et al.*, 2015); - Sense of belonging (Leimeister *et al.*, 2009); - Establishment of a network (Brabham, 2013); - Socialization (Brabham, 2013); - Network building relationships (Brabham, 2008); - Social reward (Coleman, Georgiadou and Labonte, 2009); - Contact with peers (Bretschneider, Leimeister and Mathiassen, 2014); - Social influence (Zolkepli, Hasno and Mukhiar, 2015); - Need to relate (Bretschneider, Leimeister and Mathiassen, 2014); - Social facilities (Zolkepli, Hasno and Mukhiar, 2015); - Interactivity (Zolkepli, Hasno and Mukhiar, 2015); - Civic mindset (Zolkepli, Hasno and Mukhiar, 2015).
Pleasure/fun	- Pleasure (Tran and Park, 2015; Vasantha, Corney and Smith, 2014); - Fun (Brabham, 2013; Brabham, 2008; Bretschneider, Leimeister and Mathiassen, 2014; Zolkepli, Hasno and Mukhiar, 2015); - Hobby (Brabham, 2013; Brabham, 2008); - Hedonic benefit (Brabham, 2008); - Interest and pleasure with the activity (Cupido and Ophoff, 2014); - Recreation (Anthuan, Shoaib and Jooyoung, 2012); - Entertainment (Zolkepli, Hasno and Mukhiar, 2015).
Self interest	- Intention to participate (Zheng, Li and Hou, 2014); - Feeling of being useful (Sukaini *et al.*, 2015); - Personal obligation (Zolkepli, Hasno and Mukhiar, 2015); - Commitment (Zhao and Zhu, 2014); - Self-affirmation (Zolkepli, Hasno and Mukhiar, 2015); - Curiosity and interest (Zhao and Zhu, 2014); - Contribution with project that interest (Coleman, Georgiadou and Labonte, 2009); - Production of content by oneself (Brabham, 2008); - Personal reputation (Coleman, Georgiadou and Labonte, 2009); - Protection of personal investment (Coleman, Georgiadou and Labonte, 2009); - Personal marketing (Bretschneider, Leimeister and Mathiassen, 2014); - Mental satisfaction (Hosseini *et al.*, 2015); - Self-esteem (Hosseini *et al.*, 2015); - Self-fulfillment (Zolkepli, Hasno and Mukhiar, 2015).
Sharing/altruism	- Altruism (Zhao and Zhu, 2014; Soliman and Tuunainen, 2015); - Help an organization (Gassenheimer, Siguaw and Hunter, 2013); - Sharing (Brabham, 2013); - Knowledge sharing (Coleman, Georgiadou and Labonte, 2009); - Desire to contribute (Coleman, Georgiadou and Labonte, 2009).
Love	- Love for the community (Brabham, 2010); - Pride of place (Coleman, Georgiadou and Labonte, 2009; Hosseini *et al.*, 2015); - Love for a product (Brabham, 2010); - Community, sense of belonging (Hosseini *et al.*, 2015).

Table 2 Motivation Factors and Nomenclature used in the Literature.

Source: Vianna, Peinado and Graeml (2017).

Methodological Procedures

As described above, the authors had already previously worked on understanding the types of activities that were performed in crowdsourcing initiatives (Table 1) and the motivation factors that were used by the crowdsourcers to engage crowdsourcees with the intended activities (Table 2).

Content analysis techniques were adopted to review the 31 papers that had comprised the two previous SLRs to select the crowdsourcing platforms mentioned in those studies. After that, the website of each of the 136 platform was also submitted to content analysis in order to identify its purpose. The analysis of the platforms followed the methodological procedures that had already been used by Mollick (2014), which allowed for a rigorous analysis of the relevant information in the platform to generate inferences.

For the analysis of the information contained in the papers and platforms, we used the categorizations of types of crowdsourcing activities and motivation factors as for Tables 1 and 2. The objectives of the crowdsourcing platforms and the characteristics of each platform were organized and represent an original contribution of the current work (Table 3, ahead), as well as the influence they have on the types of activities being crowdsourced (Table 4, ahead) and the incentives provided (Table 5, ahead).

Analysis of Results

The analysis of crowdsourcing platforms allowed a categorization according to the objectives of the proposed crowdsourcing activities. The 136 crowdsourcing platforms were classified into 7 categories (see Table 3).

Objective of proposed activity	Reviewed platforms
Content development	Wikipedia; Youtube; Amazon; Recaptcha; Duolinguo; Annotathon; Current.com; Knol.google.com; Emporis.com; Digg.com; Newsvine.com; National Library of Austria; Psyncopation; Project Gutenberg; Meeting of Frontiers; International Children Digital Lybrary; Latin American Open Archives Portal; Flickr; TED translator/Open Translation Project; Ispot; Numpy; Talenthouse India/My Nation Anthem Project; MOELM (Map of early modern London); Becks´s Album; Facebook; Twitter; Instagram.
Development of products and/or services	Threadless; IStockPhotos; FiatMio; NextStopDesign; Thinginverse; Zhubajie; Microsoft Advertising; MullinoCheVorrei; Scoopshot; 99designs; MyStarbuckIdea; Freelancer; LEGOMindstorm; Mattel; Dreamheels; Moblieworks; Brainspot; Quirky; Cambrianhouse; Crowdspring; PassBrains; Chaordix; Odesk; Cloudwork; Wilogo; mob4hire; Utest; Webook; FossFactory; DreamsTime; NakedandAngry; Thunderbird; Zazzle; Camiseteria; testCloud; Portolan; cs.com; Dell´s Idea Storm; Pybossa; SAPiens; Firefox; OpenOffice; Linux; Defense Threat Reduction Agency (DTRA) Algorithm Challenge; Ubuntu.
Crowdfunding	KickStarter; Kiva; Indiegogo; Rockethub; Equitynet; Invesdor; Startup Valley; Sellaband.
Provision of geo-graphic information	GoogleEarth; MissingMapProject; OpenStreet; TeleAtlas; NAVTEQ; Tomtom; Wikimapia; Wikiterra; Crisiscommons; Geo-wiki; i-Scoring; Netatmo; Platform to collect ecotourism information in Malaysia.
Provision of services	Guru.com; AngieList.com; Elance; Airbnb; Crowdmed; Openforum; Taskcn; Clickworker; Turkit; Crowdforge; Amazon Mechanical Turk; Gigawalk; FundingCircle; FundingTree; Proposer; Zopa.com.
Solution of complex projects	Innocentive; Green Challenge; Nokia Idea Project; TopCoder; IBM Innovation Jam; Crowdflower; Kaggle; Eyeca; Challenge.gov; OpenIdeo; NineSigma; Ideaconnection; Bombardier Transportation; Wiki Policing Act 2008 (New Zealand); Canada Digital Compass; Let´s Move!; Thinkfortigers.
Information exchange	Tweaker´s.net; More Fun Philippines (Feedback Roulette); IMDb; Trendhunter; Tripadvisor; ePinion.com; NetFlix; United States Patent and Trademark Office (Peer-to-peer Patent Project); The Guardian Journal; Yahoo Answers!; Gwap.com; Leadvine.

Table 3 Objective of the Activities Proposed by Crowdsourcing Platforms.

Source: research data.

As an example of how the content analysis was performed, the platform Project Gutenberg, categorized as "content development", is presented, in its homepage, as "a place full of useful information for the e-book community", working through the digitization and voluntary distribution of books. In the same category, the Duolingo platform uses crowdsourcing to teach English and claims it allows individuals to "learn while translating content from the Internet", therefore developing translated content. It is important to mention that platforms classified as social networks, such as Facebook and Instagram were also allocated in this category, because content development by their users is central to such platforms value propositions. Among platforms categorized as "development of products and/or services", we included platforms such as Threadless and Mullino Che Vorrei. Threadless, in its description, uses phrases such as "we look for the best ways to allow artists to develop their work and for fans to choose the best art [...] whenever you buy an item, you are helping

art and an artist". The Italian platform Mullino Che Vorrei was developed by a food products' brand and invites participants to develop recipes using their products. The best recipes are then chosen by the crowd, by means of voting in a competition. To categorize platforms as "crowdfunding" platforms, we analyzed the way they presented themselves to potential supporters. When the main purpose was to get some of the participants to financially support projects developed by others, they were included in this category.

Types of Activities and Motivation Factors as a Function of the Platform's Objective

After having defined the objectives of the different platforms, organizing them in categories, the next step of this study involved analyzing the types of crowdsourced activities and the motivation factors that were used by different platforms, according to their objective. To accomplish that, two different tables were elaborated. The quantities presented in the tables refer to the percentage of platforms that have a specific objective that develop each type of activity (Table 4) and use each type of motivation (Table 5).

Platform objective / Type of activity	Content development	Development of products and/or services	Crowdfunding	Provision of geographic information	Provision of services	Complex projects	Information exchange
Microtask	56%	47%	0%	77%	83%	41%	91%
Competition	20%	27%	0%	0%	0%	41%	0%
Evaluation	60%	40%	0%	46%	17%	41%	82%
Complex task	40%	71%	0%	23%	42%	88%	9%
Software development	0%	20%	0%	0%	0%	6%	0%
Voting	27%	36%	0%	31%	8%	18%	55%
Knowledge dissemination	7%	7%	0%	0%	0%	0%	0%
Open collaboration	10%	16%	0%	15%	8%	0%	0%
Sale	0%	0%	0%	0%	0%	0%	9%
Collaboration intermediate	0%	29%	75%	0%	67%	53%	0%
Public project	7%	2%	0%	0%	0%	8%	9%
Citizen science	7%	2%	0%	23%	8%	24%	0%
Sharing	10%	13%	0%	8%	8%	18%	18%

Table 4: Crowdsourcing Activities as a Function of Platform Objective.

Source: research data.

Platform objective / Motivation factors	Content development	Development of products and/or services	Crowdfunding	Provision of geographic information	Provision of services	Complex projects	Information exchange
Financial reward	10%	62%	75%	15%	69%	88%	36%
Recognition/ glory	57%	40%	0%	0%	19%	47%	55%
Career opportunities	30%	40%	0%	8%	13%	53%	27%
Knowledge/ skill development	50%	38%	0%	23%	13%	41%	9%
Relationship/ socializing	23%	16%	23%	23%	6%	6%	0%
Pleasure/fun	13%	22%	0%	0%	19%	6%	27%
Self interest	33%	29%	63%	31%	6%	24%	45%
Sharing/ altruism	40%	16%	25%	46%	0%	12%	27%
Love	57%	33%	50%	77%	13%	18%	45%

Table 5: Motivation Factors as a Function of Platform Objectives.

Source: research data.

Next, we explain in more detail the characteristics of each objective category of crowdsourcing activities performed on the reviewed platforms, in relation to the types of activities and motivation factors involved.

Content Development Platform: the most popular types of crowdsourcing activities on platforms categorized as content development platforms are evaluations (60%) and microtasks (57%). The most present motivation factors are "recognition/glory" (57%), "love" (57%) and "sharing/altruism" (40%). Content development activities seem to involve a willingness to perform non-complex tasks, which do not involve financial returns. The most frequent motivation factors suggest that individuals are compelled to perform activities because they feel engaged and positively relate to the goals of the platform. Third-party recognition is, also, an important factor in this case.

Development of Products and/or Services: "complex task" (71%) and "microtask" (47%) are the types of activities most frequently demanded in platforms that focus on developing products and/or services. Other types of activities are also worth mentioning, such as "evaluation" (40%) and "voting" (36%). As for motivation factors, present in platforms categorized as having product/service development as the main objective, we can highlight the following: “financial reward” (62%), "professional opportunity/career" (40%), "recognition/glory" (40%) and "knowledge/skill development" (38%). This suggests that individuals that help companies to develop products and/or services on crowdsourcing platforms are primarily motivated by pragmatic interests.

Crowdfunding: the crowdfunding category includes platforms that mediate the funding of projects by individual who want to support them. The type of crowdsourcing activity that is prevalent in these platforms is "collaboration intermediate" (75%), as expected. The main motivation factors present in this category are “financial reward” (75%), "self-interest" (63%) and "love" (50%). Differently to what happened with “content development”, which did not rely so much on pragmatic incentives, and “development of products and/or services”, for which that kind of incentive was very important, “crowdfunding” sometimes results from supporters who are there for financial rewards or other types of pragmatic rewards, other times it depends on altruistic reasons.

Provision of Geographic Information: this category comprises mainly “microtasks” (77%) and "evaluation" tasks (46%). As for the motivation factors, the most prevalent are "love" (76%) and "sharing/altruism" (46%), so, this is something people do without expecting to be paid for.

Provision of Services: This category usually involves activities such as "microtasks" (83%), "collaboration intermediaries" (67%) and "complex tasks" (42%). This composition suggests that platforms sometimes work as middlemen for the connection of highly specialized crowdsourcees to crowdsourcers, to perform complex activities. Other times, they coordinate the work of many individuals performing simple tasks. As for motivation factors, this category has the “financial reward” factor (69%) as the most present, suggesting that those who participate, do so for a payment.

Complex Projects: the "complex projects" category brings together platforms that require "complex tasks" to be performed by the participants (88%), many times positioning themselves as a "collaborative intermediary" (53%). These platforms stimulate the "competition" among participants, in many occasions (41%), ask them to perform "microtasks" (41%) or "evaluation" tasks (41%). Regarding the motivation factors involved, the “financial reward” factor was very frequently present in the studied platforms that had complex projects as their main objective (88%), but "professional/career opportunity" (53%), "recognition/glory" (47%) and “skills development"(41%) also represent important motivation factors.

Information Exchange: the most frequent types of activities on platform categorized as having information exchange as their main objective are “microtasks” (91%), "evaluation" (82%) and "voting" (55%), suggesting that the information exchanged often relates to evaluated aspects of a product or service, which could be subject to voting by participants. The motivation factors vary, but, the same way it happened for “content development”, they tend not to rely so much on direct monetary compensation. Factors such as "recognition/glory" (55%), "self-interest" (45%) and "love" (45%) were more important than “financial reward” (36%), though still somewhat significant.

The categorization presented here is not exhaustive, but it helps to better understand the types of activities people will be interested in performing, depending on offered incentives and the perception they have of the crowdsourcer’s objectives.

Conclusion

Crowdsourcing is an important research topic and many researchers are working on improving its understanding. However, no other study, at least to our knowledge, had tried to establish the relationship among the objectives of crowdsourcing platforms, the types of activities they demand from crowdsourcees and the incentives they provide in order to obtain collaboration. This paper represents a first attempt towards that.

The 136 platforms that appeared in the studies included in two SLRs carried out by the authors to categorize the types of activities performed and the motivation offered in crowdsourcing projects were separated in seven categories, according to the objectives of the activities performed by the crowdsourcees.

After that, the types of crowdsourcing activities and the motivation factors were related to the objectives of the crowdsourcing activities demanded by the platforms. This was done by means of content analysis of the information obtained directly from the platforms' websites, based on the categories that resulted from the previous SLRs for the types of activities and motivation factors and the ones that were generated in this study for the objectives of the demanded activities. The "microtask" type of activity appears in more than 40% of the platforms, in six of the seven categories, being characterized as an unpaid or low remuneration activity, requiring low involvement of the individuals with the objective of the activity demanded by the platform. Large volume of collaborations and low complexity of the activity are also characteristics of microtask activities. That so many platforms rely on microtasks to achieve their objectives is revealing. It shows that many individuals may be motivated to collaborate with organizations, by means of web based crowdsourcing platforms, without developing high commitment, or even identification with the objectives and goals of the organization. This is corroborated by the low involvement of crowdsourcees in "sales" activities, considering that "sales", differently to "microtasks" do involve higher commitment and identification with an organization and what it stands for.

It is important to note that either the "financial reward" or the "love" factor is always the prevailing motivation factor, except for the "information exchange" category, for which "recognition/glory" was more frequent. However, those two factors tend to be mutually exclusive, i.e., platforms that rely on love-driven collaborations tend not to rely on individuals who seek a financial return, and vice-versa.

This has severe managerial implications, as organizations need to develop an understanding of what motivates their crowdsource supporters to offer them the right incentives. Crossing data on the types of demanded activities and the objectives of the platform indicates that, when the objectives involve something that is not perceived as just the organization's business (its way of making money), participants are more inclined to perform the activities based on other kinds of incentives than a financial reward. In fact, there are activities that participants will be willing to perform on a completely voluntary basis. In those cases, offering a financial reward may produce the opposite effect to the intended one, discouraging people from collaborating. It is possible to state that the right match of the type of crowdsourcing activity and the motivation factor applied can increase crowdsourcing efficiency and effectiveness. Efficiency, in this case, is increased as a result of optimized application of resources to engage crowdsourcees. Effectiveness is achieved by aligning interests of those seeking a solution for a problem, and those who able of solving it.

Future studies may further investigate the interesting relationships that this exploratory study identified, so that organizations can gauge their incentive policies, knowing what will work better, depending on the required tasks and the perception crowdsourcees have of their objectives when crowdsourcing.

References

Anthuam, T., Shoaib, H. and Jooyoun, P. 2012. Crowd participation pattern in the phases of a product development process that utilizes crowdsourcing. *Industrial Engineering and Management Systems*, (11:3), pp. 266-275.

Bernardo, F. and Martins, L. G. 2014. Disintermediation effects on independent approaches to music business. *International Journal of Music Business Research* (3:2), pp. 7-27.

Borromeo, R. M. and Toyama, M. 2016. An investigation of unpaid crowdsourcing. *Human-centric Computing and Information Sciences* (6:1), pp. 1-19.

Borst, W. A. M. 2010. Understanding crowdsourcing: effects of motivation and rewards on participation and performance in voluntary online activities. ERIM Ph.D. Series Research in Management, *Erasmus Research Institute of Management*.

Brabham, D. C. 2010. Moving the crowd at Threadless: Motivations for participation in a crowdsourcing application. *Information, Communication & Society* (13:8), pp. 1122-1145.

Brabham, D. C. 2008. Crowdsourcing as a model for problem solving: an introduction and cases. *The International Journal of Research into New Media Technologies,* (14:1), pp. 75-90.

Brabham, D. C. 2013. Crowdsourcing. *The MIT Press Knowledge Series*. The MIT Press, Cambridge, England.

Bretschneider, U., Leimeister, J. M. and Mathiassen, L. 2014. IT-enabled product innovation: customer motivation for participating in virtual idea communities. *International Journal of Product Development*, (20:2), pp. 126-141.

Caregnato, S. E. 2011. Google acadêmico como ferramenta para os estudos de citações: avaliação da precisão das buscas por autor [GoogleScholar as a tool for citation studies; assessment on the precision of searches based on the author]. Ponto de Acesso, Salvador, (5:3), pp. 72–86.

Chai, Y., Miao., C., Sun., B., Zheng., Y. and Li, Q. 2017. Crowd science and engineering: concept and research framework. *International Journal of Crowd Science* (1:1), pp. 2-8.

Chandler, D. and Kapelner, A. 2013. Breaking monotony with meaning: motivation in crowdsourcing markets. *Journal of Economic Behavior & Organization* (90), pp. 123-133.

Cherry, M. A. 2010. A taxonomy of virtual work. *Georgia Law Review* (45), pp. 951.

Coleman, D. J., Geogiadou, Y. and Labonte, J. 2009. Volunteered geographic information: the nature and motivation of producers. *International Journal of Spatial Data Infrastructures Research*, (4:1), pp. 332-358.

Cupido, K. and Ophoff, J. 2014. A model of fundamental components for an e-government crowdsourcing platform. *Electronic Journal of e-Government*, v. 12, n. 2, 2014, pp. 142-157.

Faber, A. and Matthes, F. 2016. Crowdsourcing and crowdinnovation. *Digital Mobility Platforms and Ecosystems* (July), pp. 36-47.

Felin, T., Lakhani, K. R. and Tushman, M. L. 2017. Firms, crowds, and innovation. *Strategic organization* (15:2), pp. 119-140.

Gassenheimer, J. B., Siguaw, J. and Hunter, G. L. 2013. Exploring motivations and the capacity for business crowdsourcing. *Academy of Marketing Science Review*, (3;4), pp. 205-216.

Gehanno, J, Rollin, L. and Darmoni, S. 2013. Is the coverage of Google Scholar enough to be used alone for systematic reviews? *BMC medical informatics and decision making*, (13:1), pp. 7.

Geiger, D., Seedorf, S., Schulze, T., Nickerson, R. C. and Schader, M. 2011. Managing the crowd: towards a taxonomy of crowdsourcing processes. In Americas Conference on Information Systems, Detroit, MI, *Proceedings of… AMCIS*.

Good, B. M. and Su, A. I. 2013. Crowdsourcing for bioinformatics. *Bioinformatics* (23:16), pp. 1925-1933.

Hossain, M. and Kauranen, I. 2015. Crowdsourcing: a comprehensive literature review. *Strategic Outsourcing: An International Journal* (8:1), pp. 2-22.

Hosseini, M., Phalp, K., Taylor, J. and Ali, R. 2015. On the configuration of crowdsourcing projects. *International Journal of Information System Modeling and Design* (6:3), pp. 27-45.

Howe, J. 2005. The rise of crowdsourcing, *Wired* (14:6), pp. 1-4.

Kim, M., Gupta, B. B. and Rho, S. 2018. Crowdsourcing based scientific issue tracking with topic analysis. *Applied Soft Computing* (66), pp. 506-511.

Kosonen, M., Gan, C., Vanhala, M. and Bloqvist, K. (2014) User motivation and knowledge sharing in idea crowdsourcing. *International Journal of Innovation Management*, (18:5), pp. 1-23.

Leimeister, J. M., Huber, M., Bretschneider, U. and Krcmar, H. 2009. Leveraging crowdsourcing: activation-supporting components for IT-based ideas competition. *Journal of Management Information Systems*, (25:1), pp. 197-224.

Majchrzak, A. and Malhotra, A. 2013. Towards an information systems perspective and research agenda on crowdsourcing for innovation. *The Journal of Strategic Information Systems* (22:4), pp. 257-268.

Malone, T. W., Laubacher, R. and Dellarocas, C. 2010. The collective intelligence genome. *MIT Sloan Management Review* (51:3), pp. 21.

Mollick, E. 2014. The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing* (29:1), pp. 1-16.

Morschheuser, B., Hamari, J., Koivisto, J. and Maedche, A. 2017. Gamified crowdsourcing: Conceptualization, literature review, and future agenda. *International Journal of Human-Computer Studies* (106), pp. 26-43.

Nakatsu, R. T., Grossman, E. B. and Iacovou, C. L. 2014. A taxonomy of crowdsourcing based on task complexity. *Journal of Information Science* (40:6), pp. 823-834.

Noruzi, A. 2005. Google Scholar: the new generation of citation indexes. *Libri*, (55:4), pp. 170-180.

Padilha, M. and Graeml, A. 2015. Inteligência coletiva e gestão do conhecimento: quem é meio e quem é fim? [Collective intelligence and knowledge management: sorting out means and end] Twenty-first Americas Conference on Information Systems (AMCIS), Puerto Rico, 2015.

Prpic, J., Taeihagh, A. and Melton, J. 2015. The fundamentals of policy crowdsourcing. *Policy & Internet* (7:3), pp. 340-361.

Saxton, G. D., Oh, O. and Kishore, R. 2013. Rules of crowdsourcing: models, issues, and systems of control, *Information Systems Management* (30:1), pp. 2-20.

Schenk, E. and Guittard, C. 2011. Towards a characterization of crowdsourcing practices. *Journal of Innovation Economics* (7:1), pp. 93-107.

Schuurman, D., Baccarne, B., De Marez, L. and Mechant, P. 2012. Smart ideas for smart cities: investigating crowdsourcing for generating and selecting ideas for ICT innovation in a city context. *Journal of Theoretical and Applied Electronic Commerce Research* (7:3), pp. 49-62.

Seltzer, E. and Mahmoudi, D. 2013. Citizen participation, open innovation, and crowdsourcing: Challenges and opportunities for planning. *Journal of Planning Literature* (28:1), pp. 3-18.

Shiu, Y., Lui, L. 2015. Crowdsourcing as a participative tool in a landscape conservation initiative at the urban rural buffer zone: a case study of the Waipu District in Taichung, Taiwan. *PLERUS* (25), pp. 157-172.

Sivula, A. and Kantola, J. 2015. Integrating crowdsourcing with holistic innovation management. *International Journal of Advanced Logistics* (5:3-4), pp. 153-164.

Soliman, W. and Tuunainen, V. 2015. Understanding continued use of crowdsourcing systems: an interpretive study. *Journal of Theoretical and Applied Electronic Commerce Research*, (10:1), pp. 1-18.

Sukaini, A., Mohammed, A. K., Zhang, J. and Albazooni, A. G. Z. 2015. Mobile crowdsourcing: intrinsic and extrinsic motivational factors influencing online communities in China. *Journal of Marketing Development and Competitiveness*, (9:1), pp. 129-145.

Tran, A., Hassan, S. U and Park, J. 2012. Crowd participation pattern in the phases of a product development process that utilizes crowdsourcing. *Industrial Engineering and Management Systems* (11:3), pp. 266-275.

Tran, T. and Park, J. Y. 2015. A quantitative study of influencing factors on crowd participation in a crowdsourcing project for consumer product design. *Industrial Engineering & Management Systems* (14:4), pp. 325-334.

Vasantha, A., Viajyumar, G., Corney, J., Acur Bakir, N., Lynn, A., Jagadeesan, A. P. and Agarwal, A. 2014. Social implications of crowdsourcing in rural Scotland. *International Journal of Social Science & Human Behavior Study*, (1:3), pp. 47-52.

Vianna, F. R. P. M., Peinado, J., Graeml, A. R. 2017. As motivações que levam usuários a participar de plataformas de crowdsourcing online [Motivation factors that lead users to participate in online crowdsourcing]. In: XX Simpósio de Administração da Produção, Logística e Operações Internacionais, 2017, São Paulo. *Proceedings*...

Vianna, F. R. P. M., Peinado, J., Graeml, A. R. 2018. Uma análise dos objetivos, tipos de atividades envolvidas e fatores motivacionais em crowdsourcing [An analysis of the types of activities and motivation factors in crowdsourcing]. In: XXI Simpósio de Administração da Produção, Logística e Operações Internacionais, 2018, São Paulo. *Proceedings*...

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research*, (*39:*1), pp. 93-112.

Xie, S., Duan, J., Liu, S., Dai, Q., Liu, W., Ma, Y. and Ma, C. 2016. Crowdsourcing rapid assessment of collapsed buildings early after the earthquake based on aerial remote sensing image: A case study of Yushu earthquake. *Remote Sensing* (8:9), pp. 759.

Zhao, Y. and Zhu, Q. 2014. Effects of extrinsic and intrinsic motivation on participation in crowdsourcing contest: a perspective of self-determination theory. *Online Information Review*, (38:7), pp. 896-917.

Zheng, H., Li, D. and Hou, W. 2011. Task design, motivation, and participation in crowdsourcing contests. *International Journal of Electronic Commerce* (15:4), pp. 57-88.

Zheng, H., Li, D. and Hou, W. 2014. Task design, motivation, and participation in crowdsourcing contests. *International Journal of Electronic Commerce*, (15:14), pp. 57-88.

Zogaj, S., Bretschneider, U. and Leimeister, J. M. 2014. Managing crowdsourced software testing: a case study-based insight on the challenges of a crowdsourcing intermediary. *Journal of Business Economics* (84:3), pp. 375-405.

Zolkepli, I. A., Hasno, H. and Mukhiar, S. N. S. 2015. Online social network citizen engagement on Instagram crowdsourcing: a conceptual framework. *The Electronic Journal of Knowledge Management*, (13:4), pp. 283-292.