

Crowd-sourcing (who, why and what)

Crowd-
sourcing

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Abstract

Purpose – There is growing interest in innovative online problem-solving models such as crowdsourcing to serve individuals, firms and the society as a whole. Crowdsourcing is the combination of efforts from various sets of individuals who are either volunteering or working part-time for socioeconomic production, basically in the cyber world. This hybrid work model is already in use by businesses and entrepreneurs; some of the platforms include Amazon mechanical Turk, 99designs, Hit RECORD and Design Crowd.

Design/methodology/approach – Much has been parleyed and published, and this is primarily because of the efficient socioeconomic potentials crowdsourcing offers.

Findings – This paper addressed the following three questions to help have a better understanding of crowdsourcing: who can perform crowdsourcing? why it is relevant to crowdsource in this present proliferated internet age and if there are going to be some changes in the future and the last but not the least what can be done to promote it in the society?

Originality/value – This paper discusses the three W's and concludes with challenges facing the crowdsourcing work model.

Keywords Crowdsourcing, Outsourcing, IT, Freelancing, Open call

Paper type General review

1. Introduction

Crowdsourcing in recent years has emanated as a fresh area of study for research. Because of its uniqueness, various researchers and practitioners have found it to be a very interesting and rewarding aspect to explore (Hirth *et al.*, 2015). It is seen as a new and dynamic web-enabled service platform which is very suitable for using the tremendous potentials of the people via the internet (Hossain and Kauranen, 2015). It may appear like that the idea of



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crowdsourcing is simply twenty-first-century advancement. The expression “crowdsourcing” itself was coined in 2005 by Jeff Howe and Mark Robinson who are editors for wired magazine and therefore it advanced a year later when Jeff Howe used it as a part of his article. The word “crowdsource” was first gleaned by (Surowiecki, 2005), Surowiecki’s idea is encapsulated in the phrase “Many hands make light work”. His idea was also resonated by (Majchrzak and Malhotra, 2013) that the outcome of crowdsourcing produces superior results. Although the term is genuinely new, the thought is most certainly not new to project managers and organizations but his novelty of accomplishing huge task with high efficiency places her ahead of other IT online problem solvers. Thus, this idea transcends to dividing an undertaking into little pieces and disseminating them to free specialists has been an inventive way to deal with completing work for a considerable length of time and as well its birth efficiency (see Case Study of Peter Jackson for more insight into the theme with a scenario).

Crowdsourcing is usually credited to be an online base though not exclusively, offline cases abound. A case study was in the making of the movie “*Lord of the Rings*” directed by Peter Jackson. When there was a need to create the sound of the orc armies, the director Peter turned to a physical crowd rather than the virtual crowd as the norm. The director requested the 20,000 cricket fans in the West Pac Wellington stadium of New Zealand to yell. The sound was thus produced for the Uruk-hai orcs. However, this is not the convention, as most tasks are virtually oriented (Prpić *et al.*, 2015).

Also, it wasn’t as long ago that circulating work through mini-tasks turned into a proficient method for working together. The agricultural and mechanical economies of the past were not appropriate for expansive scale usage of a disseminated model (Rick, 2016).

In 2005, writer James Surowiecki distributed a book titled *The Wisdom of Crowds*, which was about extensively appropriating scholarly and innovative projects to get a substantial total return (Surowiecki, 2005). Under the right conditions, Surowiecki contended that the group can deliver more preferred results over individuals. The book is basically a laudation to a more communal work environment, where assorted qualities and even individual unpredictability get to be qualities, as opposed to liabilities. The book could be subtitled as “The reason the Numerous Are More Intelligent than the Few and How Aggregate Intelligence Shapes Business”.

The blueprint to the fruitful execution of crowdsourcing methods is what Surowiecki called “collection,” the framework that confines freelancers and directs their endeavors. With current advancement in technology, this collection can be accomplished in the cyber world. The tenets of crowdsourcing are to distribute work ranging from ideation, critical thinking, voting in favor of the best alternative to mini-tasks to a wide range of individuals. The controlling standard behind this philosophy is promoted by several other scholars (Simula, 2013; Ford *et al.*, 2015; Zhao and Zhu, 2014). Although, Surowiecki precisely did not use the term “crowdsourcing”, he represented the managing standards behind it, that is, differing qualities of idea, freedom, decentralization and collection of ideas. With these, he proposed that it is essential for the group to be insightful. Roberts’ view of crowdsourcing was a new way of employing non employees to overcome human resource bottlenecks. Roberts further iterated that the term of employment of these non-employees could be either short or long term given the task descriptions from the outsourcers; however, he is of the opinion that there should be no compromise in organizations goals.

The generally adopted definition of crowdsourcing is yet to emanate but the foundational definition was presented by Jeff Howe in *Wired* magazine in 2006 (Surowiecki, 2005; Jeff, 2008) He defined crowdsourcing as the demonstration of recognizing a vocation customarily performed by an assigned operator (normally a worker) and outsourcing it, for the most part

to a huge gathering of individuals in an open call. When compared to the real practicality of crowdsourcing, the definition presented by Jeff is quite concise and maybe even be somewhat of a dubious expression that leaves a lot of space for understanding (Saxton *et al.*, 2013). In the wake of this, researchers have come up with various definitions in other order to suit the real practicality of crowdsourcing. In their analysis, (Estellés-Arolas and González-Ladrón-de-Guevara, 2012) produced a substantial list of definitions related to crowdsourcing. In the same fashion (Ye and Kankanhalli, 2015), also offered their contributions and view about the theme in their study of the antecedents of organizational task crowdsourcing where they investigated 161 organizations via a survey. Their findings revealed that the most important reason among firms'/organizations' willingness to adopt crowdsourcing is merit in cost reduction and access to specialized skills which had a positive impact on the surveyed firms. This claim was also in line with the study of (Paul, 2009), in their study they queried the adoption of crowds in Dell and the outcome was obvious revealing the firm's affirmative outcome. Crowdsourcing jobs are discharged to a "group" of external entities to perform the job for the organization's benefit for a stipulated expense. Figure 1 presents a pictorial design and work of the crowdsourcing model. A detailed description of the underlying mechanism governing this work model will be discussed in Section 2.

1.1 Motivation for the study

Specific domains in information technology (IT) fields such as IT project management, web design, various development fields, database administration, programming, network administration, etc., are constantly looking for means to improve their services to their customers and to meet the increasing demand of IT in the world at large. This has been one of the most challenging factors in almost all IT organizations. Because of the recent wave of technological advancement, various IT managers and entrepreneurs have realized the tremendous power that the web wields especially when it comes to reaching out to other people to source out information. For many years, other sourcing models have existed but the current source model that is on the rise is known as crowdsourcing – whereby organizations use the web to harness the endeavors of a virtual “group” to accomplish particular hierarchical undertakings. Many managers are unaware of the value added that accrues from the multiple facets of crowdsourcing as a result of how it operates. Thus, this article will address the following salient research questions:

- Who can be crowdsourced?
- Why crowdsource?
- What is crowdsourcing?
- Finally, the general misconceptions between crowdsourcing and other similar concepts would be briefly addressed.

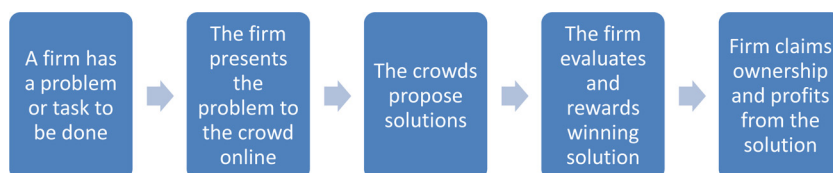


Figure 1.
General approach of
crowdsourcing

To provide clarity to the theme under consideration and extend the scant literature, the remainder of this study proceeds as follows: the next section covers the theoretical framework underpinning the study, subsequent section reviews crowdsourcing in detail; Section 3 provides further insights into crowdsourcing and related concepts. Section 4 dwells on the core of the who, why and what of crowdsourcing and finally Section 5 gives the challenges of crowdsourcing and concluding remarks.

2. Theoretical framework

This section concentrates on the theories underpinning the theme under consideration that is, the resource-based view and transaction cost theory that conceptualize crowdsourcing and solidify our study claims as well as related literature that lend support to the theories.

Similarities abound between outsourcing and crowdsourcing (Afuah and Tucci, 2012; Schenk and Guittard, 2011) both crowdsourcing and outsourcing engage outside capabilities to work on firm/organization tasks. These techniques of IT problem-solving are plagued with uncertainty. However, there exists a clear distinction between both as provided in Table II in Section 3 of this study.

Three theories are pronounced in the conceptualization of crowdsourcing as well as why organization adopt crowds namely; strategic, economic and relational theory (Heng *et al.*, 2009). The strategic theory entails the strategy that is, techniques used by organization for crowdsourcing and this concept dwells on the allocation of resources to obtain desired performance. This perspective is resonated in both knowledge-based and resource dependency theory (Barney, 2001; Pfeffer and Salancik, 1978). On the other hand, the economic theory is concerned with the gains that accrue from crowdsourcing such as cost reduction and efficiency in organizational tasks. This theory is rooted in the transaction cost theory (Coase, 1937). Finally, relational theory focuses on how organization relates with outside partners and the net benefit that is, the implication of synergy of both for crowdsourcing (Dibbern *et al.*, 2004). This theory is strengthened by institutional theory (Powell and DiMaggio, 2012), social capital theory (Nahapiet and Ghoshal, 1998) and social exchange theory (Brahman, 2008).

2.1 Crowdsourcing at a glance

The term “crowdsourcing” has been in use for about a decade and counting. It is a novel word that consists of two words “crowd” and “source” which was introduced by Mark Robinson and Jeff Howe in an article hosted by *Wired* magazine in June 2006, but the official meaning was put together by Jeff Howe (Paul, 2009). According to Jeff Howe, crowdsourcing is an act whereby an organization or institution takes a function or more which was once performed by employees and outsources them to an undefined network of people which is generally in the form of an open call (Howe, 2008). In the same vein (Prpić *et al.*, 2015) in their study asserted that crowdsourcing can be seen as the use of IT to outsource business responsibilities, that is, a crowd serves as leverage for firms to significantly attain previously unattained resources to gain competitive advantage. The major emphasis of crowdsourcing is placed on the people commonly known as “crowd.” This crowd consists of individuals scattered all over the world and the general connection factor is the web.

Paul Whitla (2009) further elaborated that crowdsourcing depicts a procedure of arranging work, where organizations bundle out different work to some type of (regularly online) group, offering rewards for anybody inside of the “group” who finishes the assignment the organization has set. The points of interest for any organization outsourcing to a group instead of performing operations themselves is that organizations can access a substantial group of potential specialists who have an assorted scope of abilities and

mastery and who are eager and ready to finish exercises within a brief time-frame and regularly at very less expense when contrasted with performing the work themselves.

Furthermore, on the conceptualization of crowds (Brabham, 2012a) in his study on crowdsourcing indicated that it is paramount to note that the procedure of crowdsourcing is one that is supported by an organization and that the work of the substantial system of individuals—the “group”—is coordinated or overseen by this organization all through the procedure. His argument is based on the procedural comparison drawn toward crowdsourcing with other systems that are similar. As an example, in the case of the open source programming, which provides a platform for various people to work on, nobody puts forth particular work to the online group there and deals with the production of articles. It is a procedure coordinated and overseen by others on the site. Open source programming, then, is not crowdsourcing, but instead an alternate and similarly imperative participatory society phenomenon which could be said to be a “center based associate creation”. (Benkler, 2002). Crowdsourcing substantially depends on the idea of aggregate knowledge. Aggregate knowledge is thought of as a type of generally conveyed insight, continually upgraded, facilitated continuously and bringing about the powerful assembly of competencies (Pierre, 1997).

The study of (Thawrani *et al.*, 2014), on medical data crowdsourcing enlightened us about the platform on which crowdsourcing is performed. The crowdsourcing stage goes about as an interface between the solicitors and group. This is the main path through which solicitors and the crowd communicate. Solicitor transfers the issue on the platform and passes it to the group, who in return choose the issue that they are interested in, unravels it and presents the solved issue on the same platform from where the solicitors access and assess it. Crowdsourcing is essentially reliant on the internet as a more suitable platform, as the internet raises the quality, sum and pace of collaboration, coordination and thought to a point that warrants its own particular order (Schenk and Guittard, 2009; Rosen, 2011). The idea of a crowdsourcing medium is what Tapscott and Williams described as “*ideagoras*” or commercial centers of opinions (Tapscott and Williams, 2006).

According to (Brabham, 2008), it is important to understand the reason behind their participation, and with this and other factors in place, an organization would be able to develop an intensive pattern on how it would crowdsource whatsoever it intends to be crowdsourced. A number of papers have investigated the factors motivating individuals to participate in this unique quest (Lakhani *et al.*, 2007; Lietsala and Joutsen, 2007). The extant research findings heralded that individual crowdsourcing motives are either intrinsic or extrinsic, and these motives are not applicable to all crowdsourcing applications. Some of these motives include the chance to add to one’s inventive aptitudes, assemble a portfolio for a future job and test one to take care of a troublesome issue and monetary incentives. Accordingly, other findings show that crowdsourcing motives include the craving to acquire cash; to add to one’s imaginative abilities; to connect with other innovative experts; to assemble a portfolio for future work; to test oneself to tackle an intense issue; to mingle and make companions; to take a break when exhausted; to add to an expansive venture of a normal hobby; to impart to others and to have a great time (Brabham, 2013).

Saxton *et al.*, 2013 in their study on the rules of crowdsourcing emphasized that there are three elements that define crowdsourcing which are, outsourcing, the crowd and the social web. According to their research, crowdsourcing can first be seen through the viewpoint of outsourcing. Outsourcing, in its most essential structure, can be considered of as the buying of a service or goods from outside suppliers (Lacity and Hirschheim, 1993; Kishore *et al.*, 2003). Hence, crowdsourcing could be considered as “little scale outsourcing” (Gefen and

Carmel, 2008). Both outsourcing and crowdsourcing offer comparative targets in that they source in their business needs from external entities.

The crowd also is viewed as an essential part of crowdsourcing according to their research. While with conventional outsourcing, an organization or company subcontracts a business process or need, for example, commodity design and product assembling, with a modest bunch of expert outside organizations, the crowdsourcing model swings to scale by means of a vague, non-proficient and heterogeneous online “group” to source in these necessities. In the crowdsourcing model, it is the online group that is relied upon to assume the part of “administration suppliers” as makers, innovators and issue solvers. This suggestion is not unimportant, in that crowdsourcing relies on upon the wide unknown “masses” found on the web, with the desire that a large-scale virtual group can beat a modest bunch of experts. Crowdsourcing as a way to achieve a vast scale, best in class electronic advances, of which the web is presently the best indication, are used to discover and control the potential “group” of specialists, arrange contracts and screen work progress progressively.

3. Crowdsourcing and related concepts

Crowdsourcing is still under development, its boundaries and features are not clearly defined; however, it is full of related ideas heralding that it is a phenomenon with its own privileges.

3.1 Open source programming

Open source programming depends on the copy left standard which remains with the expectation of complimentary access to source codes and the likelihood to modify and share codes. In this manner, open source programming can be duplicated and unreservedly circulated on a substantial scale. This bodes well because programming is a specific commercial benefit whose generation is naturally sorted out and decentralized (Foray and Zimmermann, 2001). Various components make the exposition creation mode productive in open source programming (Raymond, 1999), and there is regularly no monetary prize for commitments and the spread of information and ideas achieved in open source programming. Group-driven promoting through the web is cheap, quick and exceptionally focused on (Krishnamurthy, 2005).

Howe’s reference to crowdsourcing as an augmentation of the open source standards to different commercial ventures merits deliberation. Crowdsourcing is not open as open source programming can be (the same remains constant for open development). The opening is caught in a smaller sense, as crowdsourcing organizations, as a rule, make customary use of Intellectual Property Rights (IPR), for example, by protecting their yield. Moreover, it is clear that crowdsourcing is not confined to programming improvement (Brabham, 2008) while the conveying of open source standards to different commercial enterprises is the subject of continuous research (Raasch *et al.*, 2009). While there are similitudes between open source programming and crowdsourcing, these ideas have an alternate status. Open source is use of the crowdsourcing creation mode instead of a comparative idea.

3.2 Open development

The focal thought in open development is that in a universe of disseminated information, organizations ought to not just depend on themselves for their innovative work (Chesbrough, 2003; Chesbrough, 2007). Through the use of IPR, it is important to outsource some research and development from different organizations. On the other hand, inward

information and procedures can create benefit through licenses, joint ventures or spin-offs. This approach is especially nonconformist for organizations that actually incline toward the shutout development standard, taking into account forms that restrict the use of inside information of an organization and use next to zero outer learning. Licenses assume an uncommon role of obtaining information and budgetary valorization of learning that can't be used inside (Penin, 2008).

Open development and crowdsourcing fall inside of the same worldview: learning is conveyed and also, the commencement of research and development procedures in an organization can be a wellspring of an upper hand. The distinction is that open development concentrates only on advancement forms while crowdsourcing does not. The second distinction is that open development portrays collaboration between organizations while crowdsourcing alludes to connects between an organization and the group. Ultimately, open development is a specific type of outsourcing; however, it can't be lessened to this angle because it is a two-way handle including offering and purchasing learning and procedures.

3.3 Client development

Crowdsourcing gives a rapt attention and priority to the group, that is, people or groups without legitimate status, which organizations can outsource some of their capacities to. The similarity of crowdsourcing to the client development is quite apparently evident. In the conventional worldview, development starts in the organization (producer-focused development), while in the client development worldview, the center has moved to the client as a wellspring of development (client-focused development). Table I details the worldview of organization-focused development and client-focused development.

Client development is orchestrated by lead clients who confront particular needs (and conceivably foreseeable societal needs) and is content with catering for the expenses and dangers connected with the development. Because both client development and crowdsourcing include people functioning out of a proficient environment, the same inquiries emerge about the impetuses of members in such extents. In addition, these two marvels completely use the ICT and web apparatuses all in all, which offer access to systems of individuals without the need of formal structures or associations. The fundamental contrasts between client development and crowdsourcing are:

- client development alludes to client-driven activities while crowdsourcing is organizational oriented; and
- in client development, development is made by clients of the last item while in crowdsourcing, anybody can be included simultaneously.

Organization-focused development	Client-focused development
The organizations discover client needs	Clients advance with a specific end goal to fulfill their own particular needs
↓	↓
The organization put resources into developing the commodity	Clients unveil their developments
↓	
The organization makes benefits via IPR and distributing their commodity to the society	

Table I.
Organization-focused development versus client-focused development

3.4 Outsourcing

The term outsourcing has been in use for a very long time. It is very prevalent in various organizations and most especially the IT field has maximized the potential of outsourcing. Outsourcing is a pattern that is turning out to be more normal in the IT world and different commercial ventures for administrations that have for the most part been viewed as natural for dealing with a business. Outsourcing can run from the extensive contract in which an organization such as IBM oversees IT benefits for an organization such as Qantas Airways to the act of employing contractual workers and brief office laborers on an individual premise. There have been various misconceptions about the relationship between crowdsourcing and outsourcing. Crowdsourcing looks to assemble various skills and ability from a huge number of unknown people mostly through an open call. This implies that potential benefactors are not pre-chosen, as in outsourcing. Table II describes the differences between outsourcing and crowdsourcing.

4. Crowdsourcing (who, why and what)

4.1 Who to crowdsource?

One of the objectives of this study is to answer to the question “who to crowdsource”? Crowdsourcing obviously, is not only restricted to firms. This can be established based on the comprehensive definition of crowdsourcing given by (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). Crowdsourcing is a sort of participatory online movement in which an individual, an establishment, a non-benefit association or organization proposes a gathering of people of different specialties, variety and number, through an adaptable open call, the deliberate undertaking of an assignment. Individuals often get fulfilment through financial incentives, social acknowledgment, self-regard and advancement of skills, while the crowdsourcer will get and use their goods/service.

From this, we can observe that individuals can also be the crowdsourcer in crowdsourcing. The idea of crowdsourcing is quite open for anyone who has one or more tasks that need to be done. All that is needed is a platform which is usually online, the crowd which is willing to do the task and most probably a mutual benefit. The openness in crowdsourcing is what makes it an interesting idea. Various companies are already maximizing the potentials of crowdsourcing, and they are reaping the benefits therein. Few examples of these companies are Coca-Cola, Anheuser-Busch (AB), Unilever,

Table II.
Difference between
outsourcing and
crowdsourcing

Outsource	Crowdsource
Single area focuses: based on focus areas, ordinarily seaward and restricted to the nearby ability pool	Worldwide: not restricted by an office area. Participants can be anyplace on the planet
Set work hours: specialists execute from the office to meet client necessities	Every minute of every day: group laborers can work from anyplace. They are not restricted to specific office time and can make their own work routine
Inflexible workforce: customers resolve to a fixed staffing models that require less flexibility	Adaptable workforce: on-interest access to practice assets, in any topography and numerous dialects
Headcount valuing: typically in view of headcount and hourly rates making it troublesome for customers to anticipate throughput	Yield-based evaluating: participants are paid for returned work meeting quality norms permitting straightforwardness, consistency for outcomes in business procedures
Settled cost: office, seat and other attached costs add to the cost of the outsourcing display	No overhead expenses: no office or settled expenses connected with the model

General Mills (GenMil), Nokia etc. [Figure 2](#) presents the crowdsourcing timeline of major companies as of 2013.

4.2 Why crowdsource?

The second objective of this study is to know why organizations and individuals are embracing the concept of crowdsourcing. There exist various reasons why various organizations are embracing crowdsourcing but in its simplicity, the major reason why crowdsourcing is been done as we can observe from its definition ([Brabham, 2013](#)) is just to get one or more tasks done. Furthermore, the proliferation of the internet usage and IT is becoming well known in solution optimization among firms and interest groups, as such managers and project consultants are provided ample platforms to optimize in the task management to achieve cost reduction and gain competitive advantage. These tasks could be of any kind. For instance, InnoCentive is a crowdsourcing platform where various types of tasks that come from various domains such as computer science, pharmaceuticals, biological and industrial, etc., are presented to be solved by different people who are willing to take up the challenge. Reports for InnoCentive 2001-2006, prepared by Lakhani and his associates revealed that the crowd that solves the presented tasks were able to solve about 30 per cent of the tasks that were posted, and this brought them to the conclusion that crowd outside the confines of any company perform better at taking care of tasks ([Lakhani and Panetta, 2007](#)). In the following paragraphs, various reasons why crowdsourcing is and should be done by companies especially IT-oriented companies would be highlighted.

4.2.1 Conventional outsourcing. In the field of IT, crowdsourcing is gradually taking its stand. Companies who are outsourcing-oriented are gradually moving toward the concept of crowdsourcing. Outsourcing has been in existence at least since 1981 ([Amiti and Wei, 2004](#)), and it has been very functional in the IT world for a long period of time. As we can observe from the chart below, IT racks up 28 per cent of outsourcing activities in the market. Below

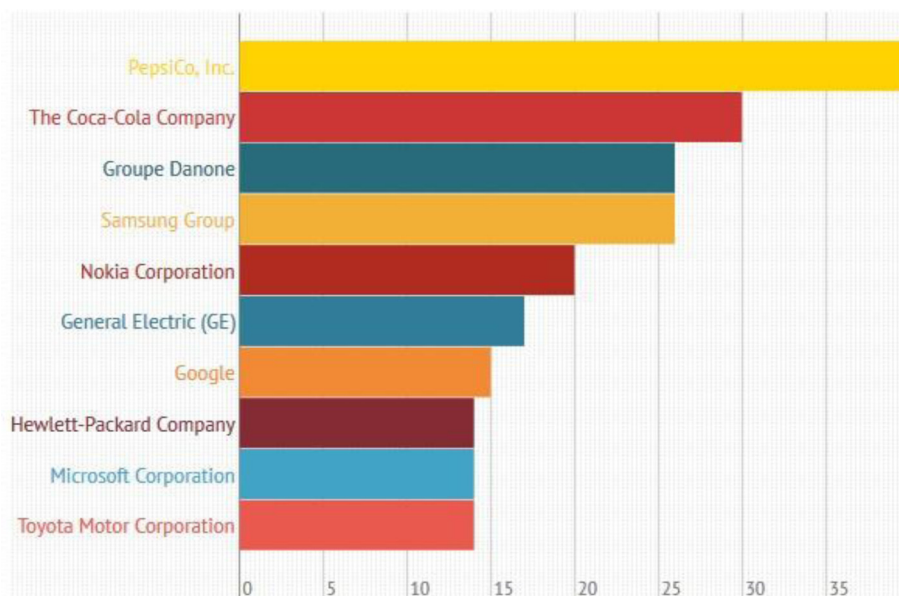


Figure 2.
Companies that are
using crowdsourcing

are few reasons why companies outsource their projects: to reduce costs; to focus on the major projects; to improve their quality; to increase speed in the market; to promote innovation; for diversification; to maximize the potential of external resources; to share risks with partner company and to conserve capital (Weidenbaum, 2005; Renner and Tebbe, 1998).

With these reasons we can observe that the intention of companies outsourcing their projects is fair and also, they can be compared to the reasons for crowdsourcing. But over the years we have seen that irrespective of the benefits outsourcing has brought to the IT market, customers are presently searching for the next leap forward in outsourcing which will help them lessen the cost, enhance time to showcase, give advanced answers and access to the right ability (Subramani and Paramasivan, 2014). The IT market could be said to have got to the climax point as far as the advantages achieved through outsourcing is concerned because of the high level of cost, delay in time-to-value, high risk and high logistics that are involved.

Crowdsourcing can be seen as a unique outsourcing approach, as it deals with the “outsourcing” of projects or sub-projects to various individuals who are willing and ready to take up the challenge (Ford *et al.*, 2015). The consistent presence of knowledgeable people online and mass-collaborative advancements have led to the empowerment of individuals who are dispersed all over the world to work toward a specific objective. The idea of crowdsourcing is sweeping across the world, and the IT market is gradually moving from the concept of outsourcing to that of crowdsourcing.

4.2.2 Customer satisfaction. The competitive environment and the high level of uncertainty in the IT market economy are gradually pushing various IT companies toward crowdsourcing with the sole aim to deliver appropriate and quality services at a lesser cost and in a short period of time. There are three major catalysts for IT companies to move toward crowdsourcing namely innovations, time-to-value and need for cost-effective solutions (Spohrer *et al.*, 2010).

4.2.3 Lack of human resources in IT field. In view of the enormous need of IT experts in the world, there seem to be few resources especially human resources to suffice these needs, and this often frustrates IT companies (Lientz and Larssen, 2006). It is seen as a major reason why IT companies are already crowdsourcing or should crowdsource. Crowdsourcing could be an effective way to harness the expertise needed in various companies from the global talent pool.

4.2.4 Budget, time and quality. Almost half of all IT projects go way beyond the initial budgets. These vast projects have approximately 45 per cent overrun on budget and 8 per cent overrun on time, at the same time presenting a 56 per cent low quality than forecasted. According to recent research, software projects have a vast majority of risks of overruns based on time and schedule (Bloch *et al.*, 2012). These discoveries which are steady crosswise over companies came out of exploration as of current research carried out on more than 5,400 IT projects by McKinsey and the BT Centre for Major Programme Management at the College of Oxford. In the wake of contrasting budgets, plans and anticipated execution advantages with the real expenses and results, it was discovered that these IT projects, altogether, had an overwhelming overrun in cost which is estimated to about \$66 billion which is very expensive. It was also discovered that the longer the scheduled time for the timeline of a project the higher the chance for overruns with respect to time and budget occur with each extra year spent on it expanding overruns in cost by an estimate of 15 per cent. The figure below demonstrates the percentage of IT projects with given issues. In view of this, some companies do survive these events but according to research (Rolfe *et al.*, 2016) about 18 per cent of IT projects’ failures generally lead to the danger of bankruptcy which could eventually bring about the closure of the company. The possibility of the idea of

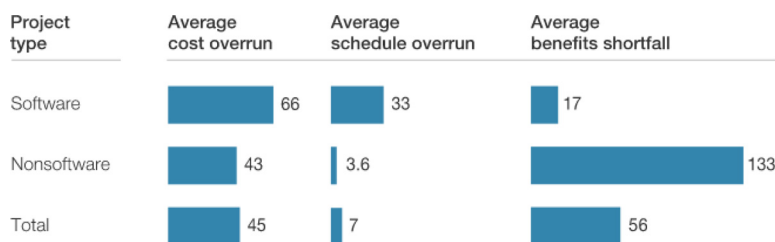
crowdsourcing being an escape route for IT companies when it comes to dealing with vast projects is very feasible (Figure 3).

4.3 What is crowdsourced?

Having answered the questions who is crowdsourced and why they should crowdsource, the third and last objective of this study is to answer the question what is crowdsourced? Judging from the definition of crowdsourcing (Estellés-Arolas and González-Ladrón-de-Guevara, 2012), crowdsourced projects and tasks are divided into micro and macro tasks.

4.3.1 Micro projects. Micro projects or tasks are quickly gaining prevalence among companies as a method of influencing human computation in their daily operations. Micro projects are considered the stronghold of crowdsourcing (Difallah *et al.*, 2015). Micro projects are mostly repetitive, require no domain-specific knowledge, take few minutes or days to complete, no need for special organization and communication and stipends are usually low. Amazon MTurk and InnoCentive are the few crowdsourcing platforms with various micro projects well known as HITs (Human Intelligence Tasks) exist. Domains of interest include business, journalism and medicine. IT and micro projects includes data classification, data moderation, algorithm training, data gathering and confirmation.

4.3.2 Macro projects. These are projects that require more time, and specific skills, requiring the crowd to use their specialties to complete part of a complex or large project. Mostly found in crowdsourcing platforms such as Topcoder and Hit RECORD. Projects are broadcasted to a community of experts who are willing to take on these challenges. Macro projects are mostly non-repetitive; require a specific domain of knowledge; longer schedule, require special organization and communication and stipends are high. Few examples of macro projects are IBM castle – email Client Mobile Design, Atrocity Prevention and HPE Haven OnDemand Force.com Client Library – Get Requests etc. In summary, what should or needs to be crowdsourced by companies, organizations, individuals and those of like minds have been highlighted in this section. Generally, the three W's which are who is crowdsourced? why should they crowdsource? what should be crowdsourced? have been addressed in this paper. Of course, the aforementioned ideas are not all that crowdsourcing has to offer but they can be seen as foundational ideas for the development of crowdsourcing especially for IT companies.



Source: McKinsey-Oxford study on references – class forecasting for IT projects (For details of McKinsey-Oxford study on references –class forecasting for IT projects is available at www.mckinsey.com/business-functions/digital-mckinsey/our-insights/delivering-large-scale-it-projects-on-time-on-budget-and-on-value)

Figure 3. Percentage of IT projects with given issue

5. Challenges in crowdsourcing

The world connectivity aided by the internet has triggered firms' openness to the crowd; the existence of ill-prepared proposals and solutions is inevitable, as such firms need to sort and filter solutions (Whitla, 2009). This seems to be one of the most prevalent challenges of crowdsourcing highlighted by researchers. Still on the constraints on crowdsourcing, (Belsky, 2010) noted that the greater part of the general population that take part in crowdsourcing are novices who produce low-quality work when contrasted with experts in the same field. But we should bear in mind that the wisdom of the crowd is considered an oxymoron. Those who participate in crowdsourcing do not always get paid; only the winner gets paid irrespective of their efforts, they do not have any insurance, pension plan and often get far lower than experts (Brabham, 2008; Berkus, 2009; Roman, 2009). This is why specialists always shun any crowdsourcing opportunities. For crowdsourcing to be fruitful, it must depend on a powerful, dynamic, inspired group and the persons being engaged must possess adequate skills and competencies in line with the organizations' set goals. (Schmidt and Jettinghoff, 2016). Irrespective of the research that has been done concerning online groups, there is still no reasonable arrangement of best practices for companies planning to construct and maintain these sorts of online groups (Brabham, 2012b). According to research done, it has been realized that a decent arrangement of time and consideration must be put in by any company to grow an online group; also, these groups need to be inspired to take an interest and finally, that group can turn on a company in ways that harm a brand's status; however, the comprehension of inconsistent online groups is still very immature (Bosman, 2006).

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