Crowd-sourcing (Who, Why and What)

ABSTRACT

There is growing interest in innovative online problem-solving models like crowdsourcing to serve individuals, firms and the society as a whole. Crowdsourcing is the combination of efforts from various set 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 includes Amazon mechanical Turk, 99designs, Hit RECORD and Design Crowd. Much has been parleyed and published, and this is primarily due to the efficient socioeconomic potentials crowdsourcing offers. The central questions relevant to the article subsumes, who crowdsource, why they crowdsource and what are the characteristics of activities they do. In order to explore new applications for the crowdsourcing model, there must be a better understanding in the context of who, why and what. This article discusses the three W's and concluded with challenges facing crowdsourcing work model.

Keywords: Crowdsourcing, Outsourcing, IT, Open call.

1. Introduction

Crowdsourcing in recent years has emanated as a fresh area of study for research. Due to its uniqueness, various researchers and practitioners have found it to be a very interesting and rewarding aspect to explore [33]. It is seen as a new and dynamic web- enabled service platform which is very suitable for utilizing the tremendous potentials of the people via the internet [3]. It may appears like crowdsourcing idea is simply a 21st-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 utilized it as a part of his article. Although the term is genuinely new, the thought is most certainly not. 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. 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 to expansive scale usage of a disseminated model [4].

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 [5]. Under the right conditions, he contended that 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 the thing that 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 is 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 the scholar Jurowiecki [5, 6]. He precisely did not utilize the term crowdsourcing but represented the managing standards behind it i.e., differing qualities of idea, freedom, decentralization, and collection of ideas. And these he proposed is essential for the group to be insightful.

The generally adopted definition of crowdsourcing is yet to emanate but the foundational definition that was presented by Jeff Howe in the Wired Magazine in 2006 [6, 7]. 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 the type of an open call. When compared to the real practicality of crowdsourcing the definition presented by Jeff is quite concise and maybe even somewhat of a dubious expression that leaves a lot of space for understanding [8]. In the wake of this researchers have come up with various definitions in other to suit the real practicality of crowdsourcing. In their analysis, Estellés-Arolas and González-Ladrón-de-Guevara produced a substantial list of definitions related to crowdsourcing [9]. Crowdsourcing jobs are discharged to a "group" of external entities to perform the job for the organization's benefit for a stipulated expense. Figure 1.1 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.

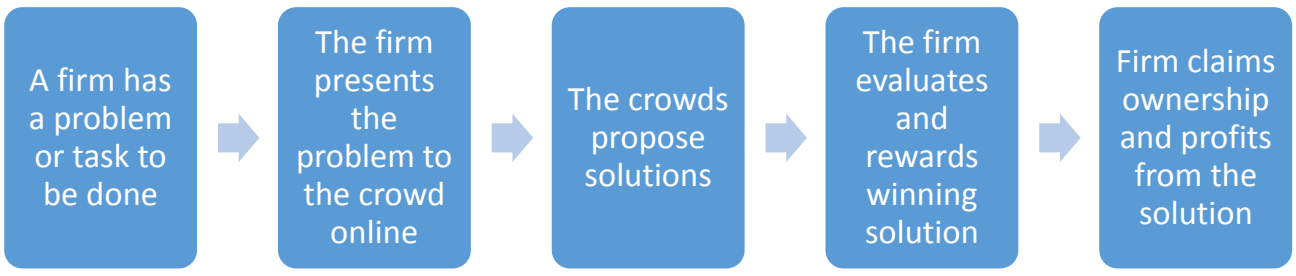

Figure 1.1: General Approach of Crowdsourcing

1.1 Value of the study

Specific domains in IT fields like the 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 factor in almost all IT organizations. Due to 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 people in other 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 utilize the web to harness the endeavors of a virtual "group" to accomplish particular hierarchical undertakings [8]. This article will address the following research questions:

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

2. Crowdsourcing at a glance

The term crowdsourcing has been in use for about 10 years 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 the Wired Magazine in June 2006 but the official meaning was put together by Jeff Howe [10]. 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 outsource them to an undefined network of people which is generally large in the form of an open call [7]. 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 states that crowdsourcing depicts a procedure of arranging work, where organizations bundle out different work to some type of (regularly online) group, offering kind of reward for anybody inside of the "group" who finishes the assignment the organization has set [10]. The points of interest for any organization of 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 inside a brief time-frame outline and regularly at a quite lessened expense when contrasted with performing the work themselves [11].

Daren C. Brabham 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 [12]. His argument is based on the procedural comparison drawn towards 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." [12, 13]. 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 [14].

Vinita Thawrani, et al work on medical data crowdsourcing enlightened us about the platform on which crowdsourcing is performed [15]. 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 era to a point that warrants its own particular order [15, 22, and 34]. The idea of a crowdsourcing medium is what Tapscott and Williams described as "*ideagoras*" or commercial centers of opinions [16].

According to Brabham, 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 [27]. A number of papers have investigated the factors motivating individuals to participate in this unique quest [17, 18]. The extent 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 oneself to take care of a troublesome issue and monetary incentives [17]. Accordingly, other findings shows that crowdsourcing motives include (1) the craving to acquire cash; (2)to add to one's imaginative abilities; (3) to connect with other innovative experts; (4) to assemble a portfolio for future work; (5) to test oneself to tackle an intense issue; (6) to mingle and make companions; (7) to take a break when exhausted; (8) to add to an expansive venture of a normal hobby; (9) to impart to others; (10) and to have a great time [35],

Saxton et al 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 [8]. 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 good that from outside suppliers [19, 20]. Hence crowdsourcing could be considered as developing a kind of "little scale

outsourcing" [21], 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 [19], 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 huge 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 utilized 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 perplexity with 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 since, programming is a specific commercial benefit whose generation can act naturally sorted out and decentralized [24]. Various components make the exposition creation mode so productive in open source programming [25], and there is regularly no monetary prize for commitments and the spread of information and ideas done in open source programming. Group driven promoting through the Web is cheap, quick and exceptionally focused on [26].

While Howe's refer to crowdsourcing as an augmentation of the open source standards to different commercial ventures merits deliberation [8]. Crowdsourcing is not open as in open source programming can be (the same remains constant for open development). The opening is caught on in a smaller sense as crowdsourcing organizations as a rule make customary utilization of Intellectual Property Rights (IPR) e.g. by protecting their yield. Moreover, it is clear that crowdsourcing is not confined to programming improvement [27] while the conveying of Open Source standards to different commercial enterprises is the subject of continuous research [28]. While there are similitudes between open source programming and crowdsourcing, these ideas have an alternate status. Open source is a utilization 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 all alone on their innovative work [29, 30]. Through the use of Intellectual Property Rights, 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 utilization of inward information inside of an organization and utilize next to zero outer learning. Licenses assume an uncommon part for information obtaining and budgetary valorization of learning that can't be utilized inside [31].

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 since 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, i.e. 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 [8]. 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 3.1 concludes the worldview of organization focused development and client focused development.

Table 3.*1*: Organization focused development versus client focused development.

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

Client development is orchestrated by lead clients who confront particular needs (and conceivably foresee societal needs) and are content with catering for the expenses and dangers connected with the development. Since both Client development and crowdsourcing include people functioning out of a proficient environment, the same inquiries emerge about the impetuses of members in such extends. Besides these two marvels completely utilize 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 is that (1) client development alludes to client-driven activities while crowdsourcing is organizational oriented; (2) In client development, development is made by clients of the last item while in crowdsourcing, anybody can

be included simultaneously.

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 like IBM oversees IT benefits for an organization like 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 3.2 describes the differences between outsourcing and crowdsourcing.

Table 3.2: 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.	The 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.

4. Crowdsourcing (Who, Why and What)

4.1 Who Crowdsource?

One of the objectives of this study is to answer to the question "who is crowdsourcing"? Crowdsourcing obviously, is not only restricted to firms. This can be establish based on the comprehensive definition of crowdsourcing given by Enrique Estellés-Arolas and colleagues in 2012 [35]. Crowdsourcing is a sort of participatory online movement in which an individual, an establishment, a non-benefit association, or organization proposes to a gathering of people of differing learning, variety, and number, through an adaptable open call, the deliberate undertaking of an assignment [35]. Individuals often get fulfilment through financial incentives, social acknowledgment, self-regard, and advancement of skills, while the Crowdsourcer will get and use their good/service [9].

From this, we can observe that individuals can also be the Crowdsourcer in crowdsourcing. The idea of crowdsourcing is quiet 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, General Mills (GenMil), Nokia etc. Figure 4.1 presents the crowdsourcing timeline of major companies as of 2013 [62].

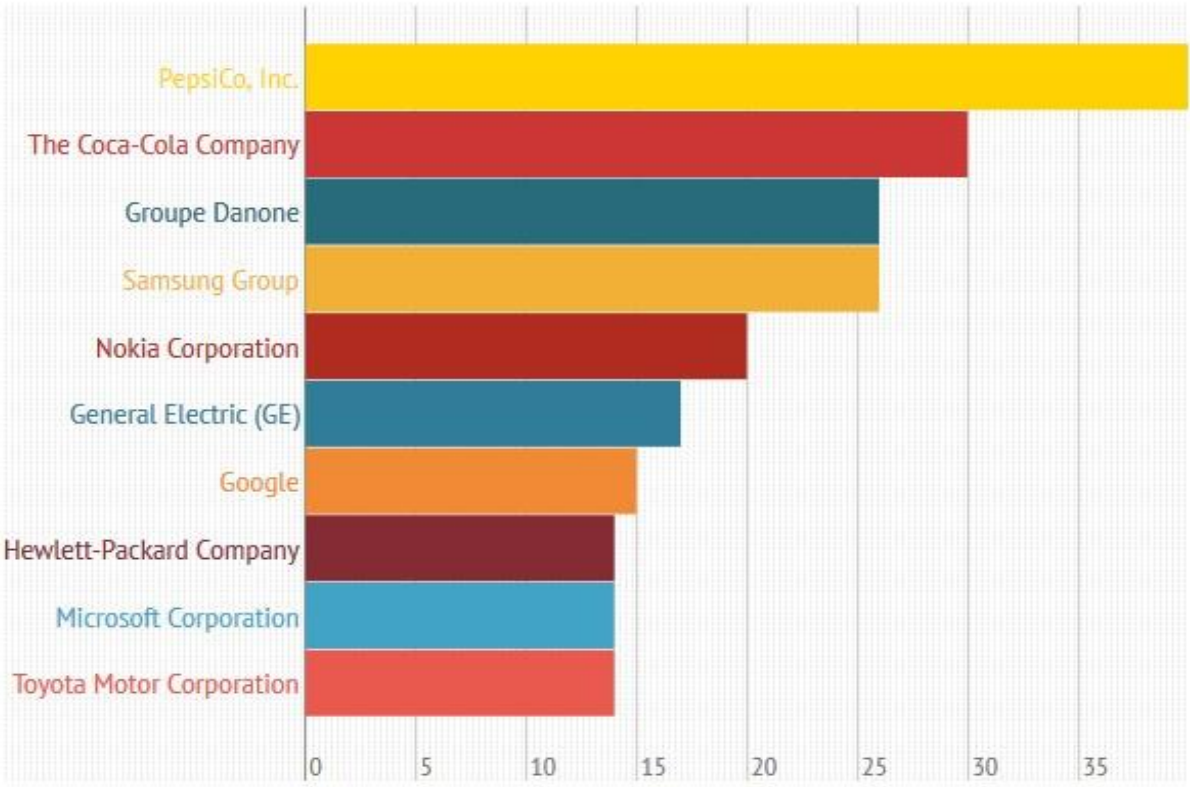

Figure 2.1: Companies that are using crowdsourcing

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 [35] is just to get one or more task done. These tasks could be of any kind. For instance, InnoCentive is a crowdsourcing platform where various types of tasks that come from various domains like computer science, pharmaceuticals, biological, and industrial etc. are presented to be solved by different people who are willing to take up the challenge [36]. Reports for InnoCentive 2001 to 2006, prepared by Lakhani and his associates revealed that the crowd that solves the presented tasks were able to solve about 30% of the tasks that were posted, and this brought them to the conclusion that crowd outside the confine of any company perform better at taking care of tasks [37]. 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 if Information Technology 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 [38] and it has been very functional in the IT world for a long period of time. As we can observe from the chart below, we can see that IT racks up 28% of outsourcing activities in the market. Below are few reasons why companies outsource their projects: (1) to reduce costs; (2) to focus on the major projects; (3) to improve their quality; to increase speed in the market; (4) to promote innovation; (5) for diversification; (6) to maximize the potential of external resources; (7) o share risks with partner company; and (8) to conserve capital [39, 40].

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 following leap forward in outsourcing which will help them lessen the cost, enhance time to showcase, give advanced answers and access to the right ability [41]. The IT market could be said to have gotten to the climax point as far as the advantages achieved through outsourcing is concerned due to the high level of cost, delay in time-to-value, high risk, and high logistics that are involved.

Active areas of outsourcing subsumes 28% information technology, 16% of human resource, 15% of sales and marketing, 11% of finance, 9% of administrative and 21% of other areas [63]. 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 [42]. 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 information technology

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 short period of time. There are majorly three catalysts for IT companies to move towards crowdsourcing namely innovations, time-to-value and need for cost effective solutions [43].

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 [44]. And it is seen as a major reason why IT companies are 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 initially budgets. These vast projects have approximately 45 percent overrun on budget and 8 percent overrun on time, at the same time presenting 56 percent low quality in value than forecasted. According to recent research, software projects have the majority of risks of overruns based on time and schedule [45]. 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 to occur with each extra year spent on it expanding overruns in cost by an estimate of 15 percent [45]. The figure below demonstrates the Percentage of IT projects with given issue [64]. In view of this, some companies do survive these events but according to research about 18 percent of vast IT projects

failure 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.

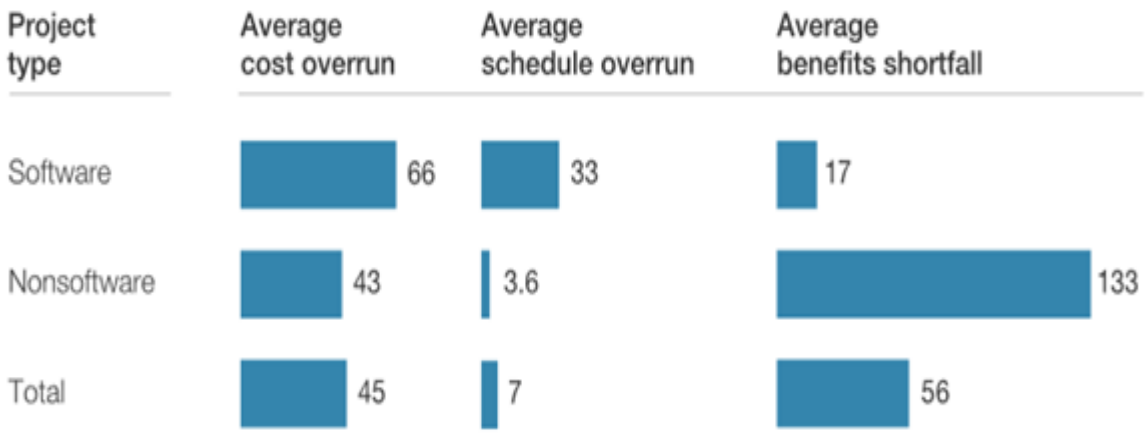

Figure 4.3: Percentage of IT projects with given issue

4.3 What is Crowdsourced?

Having answered the questions who is crowdsourcing 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 [9], 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 [46]. 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 where various micro-projects which are well known as HITs (Human Intelligence Tasks) exists. Domain of interest includes business, journalism, medicine and IT [36, 47], and micro-projects includes data classification, data moderation, algorithm training, data gathering and confirmation [48].

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 projects. Mostly found in crowdsourcing platforms like 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. [49]. 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 crowdsourcing? Why should they crowdsource? What should be crowdsourced? , has been addressed in this chapter. Of course, the aforementioned ideas are not all crowdsourcing has to offer but they can be seen as foundational ideas for the development of crowdsourcing especially for IT companies.

5. Challenges in crowdsourcing

Due to its openness to the crowd, the existence of ill-prepared proposals and solutions is inevitable, as such firms needs to sort and filter solutions. This seems to be one the most prevalent challenge of crowdsourcing highlighted by researchers [10]. Belsky 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 [52]. 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 get paid irrespective of their efforts [52], they do not have any insurance, pension plan and often get far lower than experts [53, 54]. This is why specialists always shun any crowdsourcing opportunities. For crowdsourcing to be fruitful, it must depend on a powerful, dynamic, inspired group. 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 [12]. According to research done, it has been realized that a

decent arrangement of time and consideration must be put in by any company in other 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 [55].

REFERENCES

[1] Michael, K. (2015). Mobile evolution and development of the internet. *Global Internet Report 2015.*

[2] The statistics of general internet users (2016, April 07). Retrieved from http://www.statista.com/statistics/273018/number-of-internet-users-worldwide/

[3] Tobias, H., Phuoc, T., Maja, V. (2015). Computer networks. *Special Issue on Crowdsourcing.* Computer Networks 90 1–4

[4] Rick, G. (2016). Crowdsourcing: An old idea amplified by modern technology. Retrieved from http://www.onespace.com/blog/2016/03/crowdsourcing-old-idea-amplified-by-technology/

[5] Surowiecki, J. (2005). The wisdom of crowds: *Why the Many Are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, And Nations*. Doubleday, p. 320.

[6] Henri, S. (2013). The rise and fall of crowdsourcing? *46th Hawaii International Conference on System Sciences.* Aalto University, School of Science

[7] Jeff, H. (2008). Crowdsourcing: *Why the Power of the Crowd Is Driving the Future of Business*. Crown Business, 2008, p. 320.4

[8] Gregory, D., Saxton, O. O., & Rajiv, K. (2013). Rules of crowdsourcing: models, issues, and systems of control, Information Systems Management, 30:1, 2-20, DOI: 10.1080/10580530.2013.739883

[9] Estellés-Arolas E., & González-Ladrón-de-Guevara, F. (2012). Towards an integrated crowdsourcing definition. *Journal of Information Science*, vol. xx, no. x, pp. 1-14.

[10] Paul, W. (2009). Crowdsourcing and its application in marketing activities. *Contemporary Management Research* Pages 15-28, Vol. 5, No. 1. Lingnan University

[11] Jeff, H. (2006). Crowdsourcing: a definition. *Wired Blog Network:Crowdsourcing*. Retrieved from http://crowdsourcing.typepad.com/cs/2006/06/crowdsourcing_a.html

[12] Brabham, D. C. (2011). Crowdsourcing: A model for leveraging online communities.

[13] Benkler, Y. (2002). Coase's penguin, or, Linux and the nature of the firm. *Yale Law Journal*, volume 112, number 3, pp. 369-446.

[14] Pierre, L. (1997). Collective intelligence: Mankind's emerging world in cyberspace (trans.Robert Bononno). *New York: Plenum.*

[15] Vinita, T., Narendra, D., Londhe & Randeep, S. (2014). Crowdsourcing of medical data. *IETE*

Technical Review, 31:3, 249-253, DOI:10.1080/02564602.2014.906971

[16] Tapscott, D., & Williams, A. (2006). Wikinomics*: How Mass Collaboration Changes Everything.* New York: Portfolio.

[17] Karim, R., Lakhani, Lars, B. J., Peter, A. L., & Jill A. P. (2007). The value of openness in scientific problem solving. *Harvard Business School Working Paper*, number 07-050.

[18] Katri, L. & Atte, J. (2007). Hang-a-rounds and true believers: A case analysis of the roles and motivational factors of the star trek fans. *Mind Trek Conference Proceedings*. Tampere, Finland: The Tampere University of Technology, pp. 25-30.

[19] Lacity, M. C., & Hirschheim, R. (1993). The information systems outsourcing Bandwagon. *Sloan Management Review*, *35*(1), 73–86.

[20] Kishore R., Rao H. R., Nam, K., Rajagopalan, S., & Chaudhury, A. (2003). A relationship perspective on IT outsourcing. *Communications of the ACM*, *46*(12), 86–92.

[21] Gefen, D., & Carmel, E. (2008). Is the world really flat? A look at offshoring at an online programming marketplace. *MIS Quarterly*, *32*(2), 367–384.

[22] Eric, S., & Claude, G. (2009). Crowdsourcing: What can be outsourced to the crowd, and why? <halshs-00439256v1>

[23] Jeff, H. (2008). Crowdsourcing. *New York: Crown Publishing Group.*

[24] Foray D. & Zimmermann, J. B. (2001). L'économie du logiciel libre: organization coopérative et incitation à l'innovation, *Revue Economique*, 52, 77-93.

[25] Raymond, E. (1999). *The Cathedral and the Bazaar*, O'Reilly.

[26] Krishnamurthy, S. (2005). The launching of Mozilla Firefox. *A Case Study in Community-Led Marketing*, MIT. Retrieved from http://opensource.mit.edu/papers/sandeep2.pdf

[27] Brabham, D. C. (2008). Crowdsourcing as a model for problem solving: An Introduction and Cases, Convergence, *The International Journal of Research into New Media Technologies*, 14(1), 75-90.

[28] Raasch C., Herstatt, C., & Balka, K. (2009). On the open design of tangible goods, *R&D Management*, 39(4), 382-393.

[29] Chesbrough, H. W. (2003). The era of open innovation, *MIT Sloan Management Review*, 44(3), 34–41.

[30] Chesbrough, H. W. (2007). Why companies should have open business models, *MIT Sloan Management Review*, 48(2), 21–28.

[31] Pénin, J. (2008). More open than open innovation? Rethinking the concept of openness in innovation studies. *Working Paper* n°2008-18, BETA, Strasbourg.

[32] von Hippel, E. (1988). The Sources of Innovation. Oxford University Press.

[33] Mokter, H., & Ilkka, K. (2015). Crowdsourcing: a comprehensive literature review. *Strategic Outsourcing: An International Journal*. Vol. 8 Iss 1 pp. 2 – 22

[34] Peter, A. R. (2011). Crowdsourcing lessons for organizations. *Journal of Decision Systems*, 20:3, 309-324, DOI: 10.3166/jds.20.309-324

[35] Brabham, D. C. (2013). Crowdsourcing. *The MIT Press Essential Knowledge Series*

[36] The tasks performed in InnoCentive (2016, May 22). Retrieved from https://www.innocentive.com/

[37] Lakhani, Karim, R., & Jill A. P. (2007). The Principles of distributed innovation. *Innovations: Technology, Governance, and Globalization* 2 (3):97–112.

[38] The existence of Outsourcing (2016, May 22). Retrieved from https://en.wikipedia.org/wiki/Outsourcing

[39] Why do companies Outsource? (2016, May 22). Retrieved from http://outsourcing.about.com/od/clouds/a/Why-Do-Companies-Outsource.htm

[40] Andrew, K. (2014).Top 5 Reasons companies outsource. *White Paper*.

[41] Subramani, R. & Dr. Paramasivan, T. (2014).Crowdsourcing - The next wave in IT outsourcing. *International Research Journal of Business and Management – IRJBM ISSN 2322.083X Volume NO-V*

[42] Robert, C. F., Brendan, R., & Michael, P. C. (2015). Crowdsourcing: A new way of employing non-employees? *Business Horizons Volume 58, Issue 4, Pages 377–388*

[43] IBM (2010). Achieving business value transformation through smarter sourcing. *IBM Global Business Services White Paper.*

[44] Bennet, P., Lientz, & Lee, L. (2006). Risk management for IT projects. *How to Deal with Over 150 Issues and Risks.*

[45] Michael, B., Sven, B., & Jürgen, L. (2012). Delivering large-scale IT projects on time, on budget, and on value.

[46] Djellel, E. D., Michele, C., Gianluca, D., & Panagiotis G. I., Philippe C. (2015). The Dynamics of Micro-Task Crowdsourcing. The Case of Amazon MTurk. *Florence, Italy*. ACM 978-1-4503-3469-3/15/05. http://dx.doi.org/10.1145/2736277.2741685.

[47] Various tasks performed in Amazon MTurk (2016, May 22). Retrieved from https://www.mturk.com/mturk/welcome

[48] What should you crowdsource? (May, 22 2016). Retrieved from https://squadrun.co/what-should-you-crowdsource/

[49] Examples of major projects (2016, May 22). Retrieved from https://www.topcoder.com/

[51] Roman, D. (2009). Crowdsourcing and the question of expertise. *Communications of the ACM*, Vol. 52, No. 12, 2009, p. 12.

[52] Belsky, S. (2010). Crowdsourcing is broken: How to fix it. *Bloomberg Businessweek.*

[53] Brabham, D. C. (2008). Crowdsourcing as a model for problem solving. *Convergence: The International Journal of Research into New Media Technologies.* Vol. 14, No. 1, p. 75-90.

[54] Berkus, J. (2009). Never say crowdsourcing. Retrieved from http://it.toolbox.com/blogs/database-soup/never-say-crowdsourcing-34331.

[55] Julie, B. (23 May 2016) Chevy tries a write-your-own-ad approach, and the pot-shots fly. *New York Times.*

[56] Rich, L. (2010). Tapping the wisdom of the crowd. *New York Times.*

[57] Zuk, R. (2010). By popular demand: Crowdsourcing your audience for innovation. *Public RelationsSociety of America*.

[58] Yang, J., Adamic, L. A., & Ackerman, M. S. (2008). Crowdsourcing and knowledge sharing: Strategic user behaviour on Tasks. *Proceedings of EC'08 Conference*, Chicago, IL, p. 246-255.

[59] Winsor, J. (2009). Crowdsourcing: What it means for innovation. *Bloomberg Businessweek.* Retrieved from http://www.businessweek.com/innovate/ content /jun2009/id20090615_946326.htm

[60] Dokoupil, T. (2008). Revenge of the experts. *Newsweek*. Retrieved from http://www.newsweek.com/2008/03/05/revenge-of-the-experts.html

[61] Alonso, O., Rose, D. E., & Stewart, B. (2008). Crowdsourcing for relevance evaluation. *ACM SIGIR Forum*, Vol. 42, No. 2, p. 9-15.

[62] Crowdsourcing timeline of top companies (2016, June 22). Retrieved from https://yannigroth.com/2013/12/31/to-end-2013-some-stats-from-the-crowdsourcing-timeline/

[63] Active areas in outsourcing (2016, June 22). Retrieved from http://image.slidesharecdn.com/offshoringfrukostseminarium20110831-110831070229-phpapp01/95/offshoring-frukostseminarium-20110831-12-728.jpg?cb=1314774274

[64] Percentage of IT projects with given issue (2016, June 22). Retrieved from http://www.mckinsey.com/business-functions/business-technology/our-insights/delivering-large-scale-it-projects-on-time-on-budget-and-on-value