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Crowdsourcing: Activities, Incentives and Users' Motivations to Participate

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***Abstract*- Advent of Internet provides growing features for the companies to engage users in online platforms where users share, design, and innovate different ideas. Crowdsourcing is an emerging phenomenon used to get benefits through these online community members who are unknown to companies in general. Crowdsourcing is crucial for the companies to identify consumers' needs and to solve these felt needs. The objective of this study was to explore the key activities performed through crowdsourcing, the incentives structure, geographical origins of platforms. This explorative study reveals the overall view of incentives structure in various online platforms. Collecting and analyzing information from over 400 online platforms, this study provides a phenomenal perspective in global context focusing particularly on prevalent activities, companies' incentives and geographical location etc. in relation with online crowdsourcing platforms.**

***Index Terms*- Crowdsourcing, Incentive, Motivation, Online Communities, Users' Participation.**

I. Crowdsourcing

Crowdsourcing is a concept coined by Jeff Howe in 2006 [1] and it has received phenomenal attention from researchers and practitioners. No doubt, the crowdsourcing concept has become a buzzword within a short period of time. It refers to engaging crowds to solve a problem which otherwise performed by internal (or external) employees [2]. Crowdsourcing is considered as a distributed problem-solving model. In this model, problems are broadcasted to unknown people (crowd) through open calls. The Crowds are invited to solve the conceived problems, develop innovative technology, carry out design and improve old data and/or information. Advent of Internet along with other advance technologies has augmented this phenomenon. Although, the crowdsourcing concept has come into existence very recently [3], the idea (offline crowdsourcing) goes, at least, several centuries back. The idea of online platform started in and after the year 2000.

There are, at least, several evidences of crowdsourcing (not online though) long before the advent of the Internet. However, these events were held long before the crowdsourcing concept coined in 2006. In 1418, the office of the Florence's new cathedral, Santa Maria del Fiore, announced a contest to solve a 50-year-old architectural puzzle with an open invitation for anyone to participate. More than a dozen designs were received and selected one was from an unanticipated source - goldsmith and clockmaker Filippo Brunelleschi [4]. In 1715, a contest called "Longitude prize" was held to find navigation solution in the Great Britain. At that time, people knew how to calculate the latitude but how to calculate the longitude was unknown. Unknown people gave extraordinary solution to calculate longitude in navigation. Moreover, in 18th century, the Oxford dictionary was crowdsourced by volunteers providing the word definitions in paper slips.

Ubiquitous Internet with the Web 2.0 technologies has facilitated companies to communicate in online crowdsourcing platforms more easily. Thus, the idea of user participation is increasingly growing and replacing many traditional ways of problem-solving. For example, P&G connect and develop, Innocentive, threadless, Spreadshirt, etc. are a few of the several hundred popular crowdsourcing platforms. In general, in crowdsourcing platforms, best solvers or a group of solvers are paid for their contribution. On the other hand a large number of participators do not receive any payment despite their competent efforts. However, in numerous crowdsourcing platforms, participants contribute voluntarily. In some cases, contributors are adequately compensated as they are paid up to USD$ 100 000 for a single solution. In other cases, contributors are rewarded mainly by prizes, recognition, and intellectual satisfaction. Additionally, amateurs or volunteers also provide valuable solution. Even though some crowdsourcing platforms fail and controversy and criticisms are in the frontiers, the crowdsourcing concept is used by most of the large, small and intermediary organizations.

The objective of this study is to explore the key activities in the crowdsourcing platforms, the incentives provided by the companies and the users' motivations to participate in crowdsourcing platforms. So far, a good number of studies have been conducted but most of them, as far as the researcher's knowledge goes, are based on single or several case studies. After extensive literature review, we have collected data over 400 crowdsourcing platforms and subsequently analyzed to know the overall activities,

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incentives and motivation patterns in the crowdsourcing platforms.

The next section gives insights on the benefits of crowdsourcing. Section three describes the key activities that are performed through crowdsourcing. Section four highlights the motivational factors and incentives given by companies to the contributors. Section five provides an overview of toolkits that stimulate users' contribution. Section six describes the methodology used for data collection. Section seven includes the results of the empirical study. Section eight concludes the paper with some forecasts.

II. Benefits of Crowdsourcing

In crowdsourcing platforms, some of the crowds are heavily engaged in, whereas others do not give considerable contributions. Those who engage heavily in crowdsourcing platforms are considered as the lead users. A number of studies have been performed to explore the lead users' characteristics [5]-[8]. The users, who experience the needs that are still unknown to the general people and sometime well ahead of the companies, are considered as the lead users [9]. The role of the lead users in innovation has been studied widely [7]. There is well evidence that many radical innovations are resulted from the lead users' ideas [9]. Although, the value of the lead users' contribution is very high and the normal users do not contribute significantly, yet, normal users' opinions are worthwhile for the companies in idea selection.

The Internet has blessed the business organizations to interact easily with users and to integrate the users' ideas into the product development process [10]. All the members of any online platform are not equally competent and they are very heterogeneous in nature. They have various abilities and motivations to participate in online platforms [11], [12]. The success of a crowdsourcing platform depends largely on the level of interactions and innovative members' motivations to participate [13]. Integrating community members in innovation process brings several important benefits for the companies such as 1) less marketing cost, 2) easier access to higher number of customers, 3) easier information sharing, 4) less risk on newly launched products, 5) shorter innovation cycle, 6) more loyal customers, 6) more innovative products, 7) lower production costs, 8) changing fixed cost into variable cost etc. It is conspicuous that the community members can solve highly scientific problems that companies' internal research and development (R&D) people may not solve.

Innocentive is a platform where very complex scientific challenges are posted. Members compete to solve and best solution is awarded up to US$ 100 000. To participate in this platform, people need to have scientific knowledge as posted tasks are very scientific in nature. Surprisingly, about 150,000 scientists and other professionals, from a wide range of disciplines and countries, are involved with this platform.

However, threadless is an online t-shirt selling platform where scientific knowledge is not necessary to participate. Anyone can submit T-shirt design and the large community members' rate on each design and the most rated design are usually manufactured and sold to the potential customers. Winners get rewarded before production of the selected design and also get benefits on selling. In this platform, it is not necessary for someone to be professional designers to submit a T-shirt design. More importantly, any community members can vote online to rate a submitted design.

Another successful platform is 99designs - a design crowdsourcing platform. It attracts a large numbers of designers to design web, business card, brochure, logo etc. Solution seeking companies can select designs from a large number of submissions and selected designs are rewarded financially. Finally, a very well-known example is the Wikipedia where volunteers upload information with no reward in return. It has become one of the most visited platforms for the information seekers. In some cases, the reliability of the Wikipedia information is considered higher than the information provided by the other highly established encyclopedias.

From the above examples, it seems that the companies can benefit significantly from the online platforms. Successful platforms require well-balanced community members. What activities can be accomplished through crowdsourcing is a vital issue. To attract these community members, it is crucial to know what motivates them to participate in crowdsourcing platforms. Motivational factors vary for different tasks. The companies can establish appropriate incentive mechanisms once users' motivation to participate is accurately known.

III. Activities Through Crowdsourcing

What kind of activities can be performed through crowdsourcing is a common question that comes to our mind. The truth is that crowdsourcing is used and might be used in all purpose. For instances, ideation, innovation, content, knowledge, software, crowdfunding, cloud labor, civic engagement, creativity, community building, open innovation etc. are the prominent activities which can be successfully accomplished through crowdsourcing [14]. Crowdsourcing is widely used for research & development, marketing, design & idea platforms, freelancers, open innovation, software, intermediary, open innovation services, product ideas, peer production, public crowdsourcing etc. [15]. Involving users into product and service development is not a new issue [16] but the movement has been accelerated tremendously with the impetus of crowdourcing and the advent of the Web 2.0. Interestingly, crowdsourcing is increasingly capturing marketing-related areas such as advertising, promotion, marketing research, product development etc. In some cases, users jointly develop and market products and bear costs associated with the product to take products into the target customers.

IV. Motivations and Incentives

Motivation is chiefly classified into two – intrinsic and extrinsic. Intrinsic motivation refers to the motivations that driven by the task and individuals do not rely on external pressure [25]. The accomplishment of a crowdsourcing

platform mainly depends on members and their motivation to participate. The motivation is considered as a process to release, control, and maintain physical and mental activities [17]. It is very decisive to know the factors that motivate people to participate. Knowing insight about incentives required to increase motivation, can boast the users' participation in crowdsourcing platforms. It determines the quality and the quantity of contributions [10].

In crowdsourcing platforms, the significant extrinsic motivational factors are reputation, status, peer pressure, fame, community identification and fun etc. [29]-[33]. Fun and enjoyment are considered as the two leading intrinsic motivational factors prevalent in online platforms [20], [21], [34], [35], [36]. Users' motivation to participate in online platforms initially started from the open source software field [18]-[23] where highly skilled computer programmers spend their time freely. They are not paid at all nor do they expect it in general. The programmers are hobbyists [19].

Motivation arises through interaction among different motives and incentives in a particular situation [24]. Study on motivation primarily started from early 1970s and psychologists are considered as pioneers in the motivation study [26]-[28]. People are intrinsically motivated if they the task itself is enough for satisfaction and there is no further reward apart from the activity [26]. Extrinsic motivation is driven by external incentives [27]. When the motives are apart from the actual activity, external factors such as money, fame, prize etc. prompt motivation [28]. In open source software, intrinsic incentive is a dominant motivational factor [18]-[22]. However, there is conflicting evidence between extrinsic and intrinsic motivational factors [37]-[42]. In some cases, rewards to stimulate extrinsic motivation can have adverse effect on the intrinsic motivation too [43], [44].

V. Toolkits

Acquiring information about customer preference is a fundamental issue to consider for product and service development [45], [46]. To make products and services responsive to the target customers is a growing challenge because markets are becoming more competitive continuously. On the other hand, understanding the users' needs are complex and difficult [47].

Internet technology facilitates companies' easier interactions with customers [48] and diminishes the role of intermediaries such as whole sellers, retailers, market research firms [11], [49]. It is crucial to know the customers' needs to satisfy them. However, higher customer satisfaction comes with higher costs [47]. Toolkits play a pivotal role to augment the interactions between product developers and (potential) users [47]. More importantly, perhaps, toolkits shift the location of design tasks from the locus of the manufacturers to the locus of the users [50]-[53].

Companies are equipping with users toolkits emerged in the 1980s to involve users more conveniently in the product and service development process [47], [54]. Companies get several advantages for using toolkits: (1) to extract "sticky" user information, (2) benefits through users' learning by doing [47] and (3) enhance customer satisfaction [55], [56]. Toubia and Flores [57] believe that it is beneficial to involve users in idea screening process, too.

VI. Methodology

The data from over 400 online crowdsourcing platforms were collected for this study purpose. List of the platforms were found from literature, several websites where platform names are listed. Each of these platform websites was visited and the information on the key activities, incentives given to participators was extracted. There were several visits have been made to some platforms to re-confirm the authenticity of information. Moreover, press release, news, and people work with platforms, are considered to get further information about the names of the platforms. The data were collected during September to December, 2011. What kind activities are prevalent in each platform were collected based on four categories: Creativity, Knowledge, Labor, Content, and Crowdfunding. The reason to consider these categories is that these categories were made by a popular crowdsourcing related organization called crowdsourcing.org. Some platforms are involved with only category of activities while others are involved all four categories of activities. If any platform involved with more than one categories we considered theirs activities in the all the categories they worked on. Information on incentives has been collected mostly based on the information available in each platform website. If there any monetary incentives in a platform, there are clear mention of the amount of rewards for accomplishment of an activity. Each company website has sufficient information regarding how they reward participators. Hence, we collected information from each platform website. Incentives were initially classified into two: extrinsic and intrinsic. Extrinsic motivation has been subdivided into two categories: financial and non-financial
If a platform includes all three types of incentives, it was considered in all three categories. Moreover, the country wise physical location of office of each platform has been recorded to see where crowdsourcing phenomenon is dominated.

VII. Results

A. Key Activities

For this study purpose, the key activities in the crowdsourcing platforms were divided into five categories: labor, knowledge, creativity, content and funding (fig. 1). All the values in the figure are in percentage (%). The first four of the above categories are considered as the main categories. Among these four main categories, three activities creativity, knowledge, and labor have almost equal presence in the considered crowdsourcing platforms. 57% of the activities in the crowdsourcing platforms are creativity. Knowledge was crowdsourced in approximately slightly over every second platform (55.2 %). Whereas, labor crowdsourcing activities has been found in 51.8% of the platforms. Content was

crowdsourced nearly in every sixth (16.5 %) of the crowdsourcing platforms.

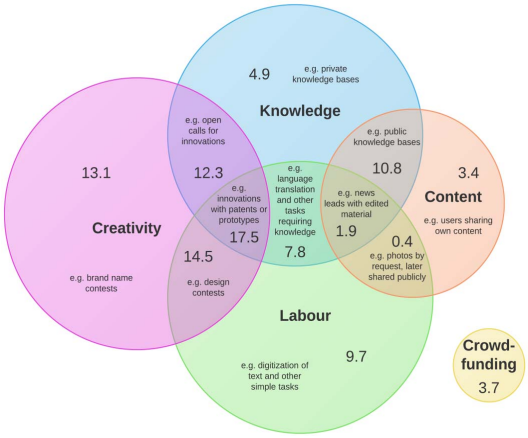

Fig.1 Activities prevalent in crowdsourcing platform (n =268; %)

Typically, activities of more than one category at a time were present in many platforms. Most common case was crowdsourcing knowledge, creativity and labor, e.g. arranging an open call on innovative products. Crowdfunding was occupied in 3.7 % of the activities in the platforms.

Many of the platforms do crowdsource several types of activities (see fig. 1) simultaneously. Whereas, some of the platforms are heavily involved with only single category of crowdsourcing. As we see in the above figure of Venn diagram, there is overlapping of activities in the four major categories. Moreover, in the categorical relation, creativity and labor (32%), creativity and knowledge (29.8%), knowledge and labor (27.2%) etc. are almost equally prevalent. However, content category has most relation with knowledge category (12.7%) followed by the relation with the labor category (2.3%). The relation among creativity, knowledge and labor is very remarkable (17.5%). In contrary, crowdfunding has no overlapping with any other activities.

B. Incentives given by Platform Authority

The overall incentive categories used in different platforms have been collected. Activities were broadly classified into two categories: 1) financial incentives, and 2) non-financial incentives. Financial incentives are single time incentives, perpetual or based on revenue from generated idea. The range of financial incentives is very wide and largely depends on the task accomplished. They can range from several hundred US dollars to one hundred thousand US dollars. On the other hand, non-financial incentives are numerous and it is challenging to array them into different clusters. So, the size of incentives not only varies in different platforms but also it varies within a single platform. It includes both financial and non-financial incentives. Extrinsic incentives are highly prevalent in the online platforms for crowdsourcing. These incentives are used in 72.4 % of the platforms and intrinsic motivation is used in the remaining 27.6 % (Fig. 2).

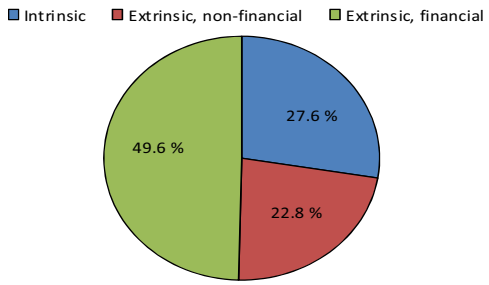

Fig.2 Incentives to users to participate in crowdsourcing platforms (n = 268)

It has been revealed that in 49.6% of the considered platforms, financial incentives are used. Moreover, within extrinsic incentives, financial incentives include 50.4% of the considered platforms. Several platforms listed more than one type of incentive with the emphasis on finance. Half of the platforms utilize financial incentives, whereas intrinsic and non-financial incentives were main incentives in almost a quarter of the platforms.

C. Geographical Origins of Platforms

In the age of the Internet, many people believe that the geographical location of people and country of origin, language spoken etc. are not issues to consider. Our study revealed strikingly different picture of this idea.

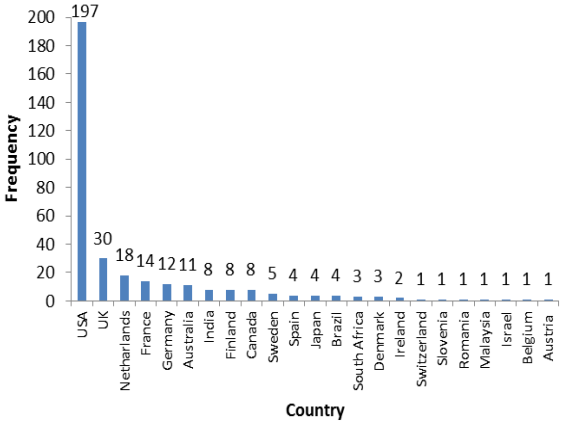

Fig.3 Country-wise Origin of crowdsourcing platforms (n= 345)

Among the platforms considered for this study, a total of 197 online platforms originated from the USA (Fig. 3). UK is the second most common location of platform origin, though the number (30) of platforms in UK is much lower than the number of platforms in the USA. The Netherlands (18), France (14), Germany (12), Australia (11), Finland (8), and India (8), are the other dominant places of online platform origin. Additionally, in most of the other developed and highly developing countries, the idea of online platforms is present.

VIII. CONCLUSION

The evolution of crowdsourcing platforms started primarily in early 2000s and it has been growing very strikingly. This study is the first of its kind as to the best of our knowledge; no study has been conducted so comprehensively to determine the key activities; motivational factors and incentives used in different platforms, and the sectors where the crowdsourcing phenomenon is more widespread. Both financial and non-financial incentives are almost equally important. However, incentive largely depends on the type of activity to be accomplished. Generally, in time consuming, scientific problem solving tasks, financial incentives are predominantly used. Moreover, in tedious tasks, the presence of financial incentives is well evident. Both financial and non-financial motivations are almost equally dominant in crowdsourcing platforms. However, the extrinsic motivation is more dominant than the intrinsic motivation.

The distribution of activities thorough online crowdsourcing platforms, under four categories: creativity, content, knowledge, and labour, are almost equally present. However, activities in the content category are less prevalent. Crowdfunding is a relatively new and growing phenomenon in the crowdsourcing arena. Crowdfunding is a more recently emerged activity and it is growing rapidly.

In this paper, motivation and incentives have been studied in a broader perspective. Most study used single case study. Motivation and incentive vary across platforms because tasks are heterogeneous. Different set of skills is required for different online works. This study have gone a step further and considered a whole possible list of the online platforms. This study reveals the overall incentives pattern in different online platforms

This study has several limitations. The information has been collected from various sources, which may not be fully reliable. There might have many platforms which use other communication languages than English, so collecting information from those platforms is beyond our scope. Future studies may consider more detailed information, such as considering variables like the number of employees, turnover, profit margin, growth, challenges etc. Moreover, platforms which used language other than English could be considered so that more platforms can be included.

Different tasks from small, mundane work to creative, industrial problem solving can be crowdsourced even in small scale to a vast pool of labour with often relatively low cost. As a phenomenon, this is an interesting research arena, since in addition to studying the development of the phenomenon in the past, it might be very interesting to study the possible future developments that crowdsourcing could inflict.

Perhaps the most radical, although not the most far-fetched consequence of the crowdsourcing phenomenon could be a profound change in the concept of work for the modern society. Crowdsourcing could enable a change not only in the mundane, mechanical working tasks, but also in the creative and knowledge-intensive tasks, such as research and development of a company. And, as we see from the results of this study, this is already a reality in many fields although not in full scale. Yet, there is a substantial possibility, be it then a risk or an opportunity, that crowdsourcing enables a similar revolution to knowledge-intensive workers that industrial automation did for the blue collar workers in the 20th century.

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