Engaging Social Medias: Case Mobile Crowdsourcing

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ABSTRACT

In this paper we present an attempt of engaging social media population for bringing crowdsourcing model into a mobile context. The proposed social media crowdsourcing platform leverages the existing social networking applications to rapidly allocate microtasks to a wide network of crowdworkers, and visualizes the geotagged result data in order to create a sort of visual information pool for public use. Activating participation is the critical success factor of social media engagement, and it is a significant challenge for researchers and practitioners to find ways to engage and direct the participants' attention to useful purposes. In this paper, we review three approaches to incentivising engagement in social media, especially mobile social media: the game-based incentives, the social psychological incentives, and the economic incentives. Their use and measurement is examined in the context of a specific application, a mobile social search system. A prototype system and its user study are described. The results will contribute to the understanding of engagement and incentives in mobile social media.

Categories and Subject Descriptors

H.5.m [**Information interfaces and presentation (e.g., HCI)**]: Miscellaneous; H.4.0 [**Information systems applications**]: General; H.1.2 [**User/Machine Systems**]: Human factors

General Terms

Design; Human Factors

Keywords

Social media engagement, crowdsourcing, human computation, incentive mechanism, mobile social search

1. INTRODUCTION

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Smartphones define a trend towards increasing combination and integration of computing, sensing, and positioning capabilities with almost ubiquitous interconnectivity. Which in consequence facilitates the implementation of rich-content mobile social networking applications. Result in a mobile and social computing infrastructure that will benefit both users and technology providers by engaging more potential content contributors. The purpose of this line of research is to examine how to engage social media population in order to effortlessly bring the crowdsourcing application into a mobile context.

Crowdsourcing is the act of outsourcing tasks, traditionally performed by an employee or contractor, to a large group of Internet population (the wise crowd) by means of an open call. The potential of mixing mobile technologies and crowdsourcing offers vaster resources of computation. For instance, in nowadays urban areas it is common that people allot a large amount of time for commuting or waiting for various events. Thereby, their time is actually fragmented into numerous small pieces of time and most of them are occupied with meaningless activities. We believe that, in this case, the crowdsourcing model provides a win-win solution for better use of this time by engaging people through their networked and ubiquitous mobile devices. However, most of the current human computation and crowdsourcing systems (e.g., Amazon Mechanical Turk [1]) are passive services that are using worker-pull strategy to allocate tasks, and require relatively complex operation to create a new task. Hence such systems fail to adapt to the mobile context where users require simple input method and rapid response.

In this paper we introduce a crowdsourcing platform designed for mobile users. Our design principle is simple: build the system around existing social media platforms — the popular services that inherently have the culture of sharing and participation, and are already well known and used by a large and growing number of users. Diverse mobile applications are available for job providers to handily create a task. Tasks are delivered to appropriate members in a community of voluntary participants, in the form of an open call, via different social media platforms (Twitter, Facebook, Mixi, etc.) and email. If suitable, the geotagged result data may also be visualized on social mapping tools (e.g., Ushahidi [6]) and/or argument reality platforms (e.g., Sekai Camera [5]), result in an information pool that creates a public good.

Activating participation is the critical success factor of social

media engagement, and it is a significant challenge for researchers and practitioners to find ways to engage and direct the participants' attention to useful purposes. In this paper, we review three approaches to incentivising engagement in social media, especially mobile social media: the game-based incentives, the social incentives and the economic incentives. Additionally, we discuss how the crowdworkers' various cultural backgrounds may affect their incentive preferences. Their use and measurement is examined in the context of a case study, *UbiAsk* system. A prototype and user study of UbiAsk are described.

2. MOBILE CROWDSOURCING PLATFORM

We present a mobile crowdsourcing platform, in which the ubiquitous users in the cloud can rapidly create, deliver, perform the microtasks and share the results via different social medias.

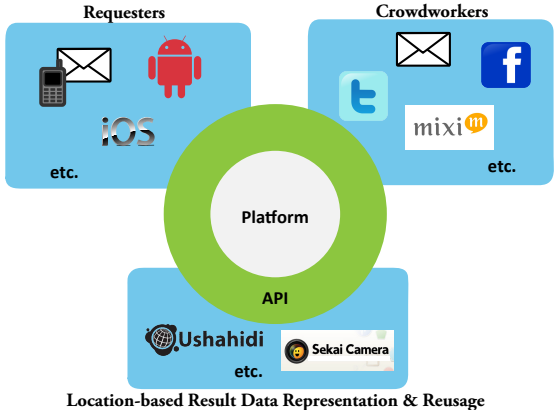

Figure 1: Platform System Architecture

Figure 1 illustrates the basic system architecture. Diverse methods can be utilized by the job provider to quickly create and submit a task to the server. Proxy server pushes the task to appropriate workers via emails as well as different social media platforms such as Twitter or Facebook. We argue that the results may be not only valuable for the original requester but also beneficial to a broader public. Thereby, optionally, the location based result data can be visualized with other social mapping platforms and/or social augmented reality services.

A significant distinction between this platform and other mobile crowdsourcing systems (e.g., [14]) is that the work assignments in the system also originate from a *crowd* of numerous mobile users rather than contracting companies or individuals.

3. PARTICIPATION INCENTIVES

How to design appropriate motivational mechanisms to promote active participation is known to be the critical factor of social media engagement. Previous studies in social and computer science have identified a list of approaches to motivate social engagements [9, 13]. In this paper we focus on three main approaches among others: the game-based incentives, the social incentives, and the economic incentives. The purpose of this section is *not* to give a ranking of the methods. Instead, we advocate for an appropriate exercise of the different motivational mechanisms, depending on the particular usage or application domain of the platform.

3.1 Game Based Incentives

The idea of taking entertaining and engaging elements from computer games and using them to incentivise participation in other contexts is increasingly studied in a variety of fields. In education, the approach is known as "serious games" [23] and in human computing it is sometimes called "games with a purpose" [20]. Most recently, digital marketing and social media practitioners have adopted this approach under the term "gamification" [22]. The idea is to make a task entertaining, like a on-line game, thus making it possible to engage people to conscientiously perform tasks. The valuable output data itself is actually generated as a byproduct by the game. However, on the other hand, the difficulty of designing such a game is also a well known problem. In many situations the tasks can be too boring or complicated to turn into any game that is actually enjoyable or fun to play. There is no consensus on how to measure the effect of game elements in social media application, but traditional measures such as use frequency and usage time are applicable.

The ESP game [3] is one of the most famous examples of this kind. Players are paired in the game and they need to give relevant descriptions for a given image. If the description matched with other player's answer, players win and score the points, otherwise lose. The real purpose of the game is to rapidly collect annotations for a large number of images. Thereafter, various games have been devised in the style of ESP game. Arase et al. [8] proposed a web-based multiplayer game to collect knowledge on the geographical relevance of images, in order to better represent certain images' geographical context for searching and browsing. Other than the casual games, Markus Krause et al. [16] implemented a relatively complex action game *OnToGalaxy* in the context of human computation. In their design the task is hidden in the gameplay that it is no longer perceived as a dominant element of the game.

3.2 Social Incentives

Social psychological, such as social facilitation effect or social loafing, is another widely harnessed non-monetary incentive mechanism to promote increased contributions to on-line systems. Social facilitation effect [21] refers to the tendency of people perform better on *simple tasks* while under someone else's watching, rather than while they are alone or when they are working alongside other people. On the other hand, the social loafing effect [17] is the phenomenon of people making less effort to achieve a goal when they work in a group than when they work alone, since they feel their contributions do not count, are not evaluated or valued. This is seen as one of the main reasons group are less productive than the combined performance of members working alone.

Ways of taking the advantage of the positive social facilitation and avoiding the negative social loafing in for online data collection systems were suggested in [7]: individuals' efforts should be prominently displayed, individuals should know that their work can easily be evaluated by others, and the unique value of each individual's contribution should be

emphasized. Cheshire, C. et al. [11] conducted a series of quantitative field experiments to examine the effects of social psychological incentives and their results demonstrated social psychological incentives like historical reminders of past behavior or ranking of contributions can significantly increase repeat contributions. The measurement applied in the experiments was the average number of contributions per contribution session of a given individual. In addition, web browser cookie was used to identify users in order to account for multiple sessions by a same user.

3.3 Economic Incentives

Economic incentives are the real money or any other commodity that the users consider valuable. They are probably the most straightforward way to motivate participants. B. Frei [15] reported a simple comparison study between paid and free crowdsourcing. The results show that in most of the application domains the paid crowdsourcing can produce better completion rate and processing time than the free crowdsourcing. However, once with money being involved, quality control becomes a major issue due to the anonymous and distributed nature of crowdworkers. Although the quantity of work performed by participants can be increased, the quality cannot, since crowdworkers may tend to cheat the system in order to increase their overall rate of pay. Another drawback with economic incentives is that they can destroy pre-existing intrinsic motivations in a process known as "crowding out" [12], so they are better used when other motivations are not likely to exist.

Amazon Mechanical Turk is one of the most popular online crowdourcing marketplaces. Job providers advertise small tasks ("Human Intelligence Tasks", or HITs) on the website, and give small money as rewards for each task. Generally crowdworkers complete the tasks directly on the Mechanical Turk web site. Another example that uses economic motivation is *CrowdFlower* [2]. Contrary to Mechanical Turk, CrowdFlower also involves virtual money in their rewards system. Traditionally online game (e.g., Farmville [4]) players can earn in-game currency by taking part in surveys or by clicking adverts, now they have a chance to complete CrowFlower tasks via a system called Virtual Pay.

3.4 Cultural Difference and Incentives

Lots of studies have been conducted on the topic of designing incentive mechanisms in on-line systems, however only a handful of research have insight into how the difference of the people' cultural backgrounds may influence their preferences and decisions.

D. Chandler et al. [10] conducted a natural field experiment that investigates the meaningfulness of a task and people's willingness to work. They compared the outcomes from crowdworkers from different countries (e.g., U.S. and Indian). The results reported USA workers were induced to work at higher proportion when given cues that their task was meaningful, while Indian users were not. J. Ross et al.'s research [19] further explained the results by exploring the worker population and usage behaviors in Amazon Mechanical Turk. They found that, unlike moderate-income U.S. based workers who were more likely doing tasks for fun, there were increasing number of International workforce from lower-income countries (e.g., Indian) who treat the micro tasks as one of their major income source and actually rely on it to make ends meet.

4. CASE STUDY: MOBILE SOCIAL SEARCH

UbiAsk is a human computing platform for assisting foreign travelers in Japan by answering their image based questions at hand in a timely fashion. After several rounds of design iteration including formative evaluation with potential users [18], we implemented a prototype version of UbiAsk. Traveler can use an iPhone application or mobile email to make a new request. The request is assigned to local experts (i.e., normal local users) via email and Twitter. The result data is visualized on an Ushahidi based interactive map (see Figure 3).

Q: Why there are so many kimono grils on the street today?
LE1: They were attending the "seijin-shiki", but I dont know its eng name, sorry.
LE2: Today is the Coming-of-age day, youth are 20 years of age need to attend a very special ceremony.

Figure 2: A sample interaction with UbiAsk

A location based mobile game was designed and implemented as local experts' incentive. The main interface of the game (see Figure 4) is a Google map based real world map, which is divided into non-overlapping hexagons. The goal of the game is to conquer territories. Every hexagon has one owner, who is the player with the highest number of "task-done".

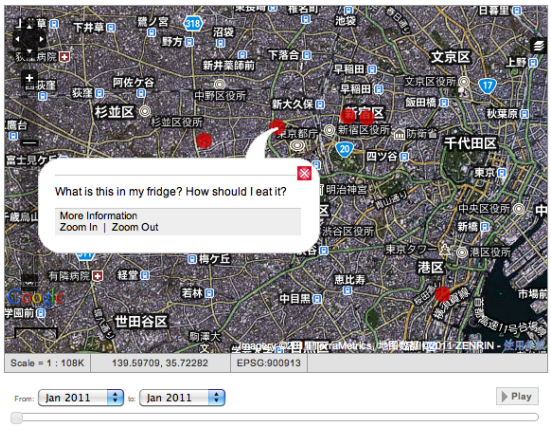

Figure 3: Interactive map for visualizing result data

From the end of January 2011, we have been running a controlled field experiment in Japan to examine the relative

effectiveness of the incentive systems detailed above. The experiment involves 50 participants recruited from the Internet. 30 of the participants are Japanese natives who act as local experts, and 20 are foreigners in Japan who act as requesters. The local experts are divided into three groups in order to compare the effectiveness of the three incentive mechanisms. At the time of writing this submission the experiment is still ongoing, but results will be available by the time of the workshop presentation.

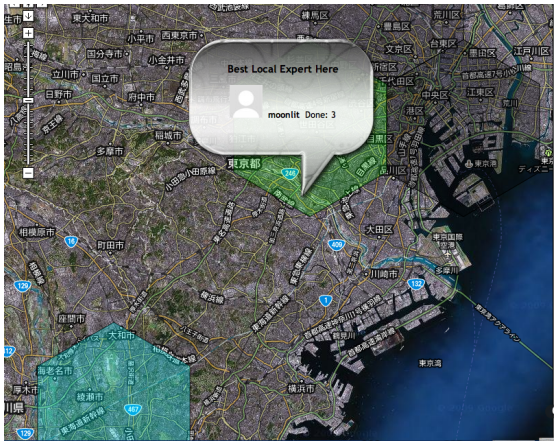

Figure 4: Main interface of the location based game

5. FUTURE DIRECTION

How to achieve efficient and appropriate task allocation is an important topic of this work. Here *appropriateness* stands for two aspects: the *capacity*, and the *availability*. Capacity indicates whether a worker has enough knowledge or skill to accomplish the task, and availability is about whether or not this is a *good* time that the user is willing to work. Compared to ordinary everyday tasks, micro-tasks are commonly defined as jobs with lightweight workload and low difficulty. As a consequence, the capability requirement of crowdsourcing is less strict. The other requirement, detection of a user's availability, is more difficult to deal with. It is not only about determining if people are free, but may also involve more complicated factors like expertise and properties of questions, etc. We believe if the availability of an individual at given time is detectable, both response rate and time of mobile crowdsourcing can be greatly improved. In the next steps of this project, we plan to look deeper into this issue.

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