Crowdex: A Crowd Work Management System

Dušan CYMOREK [2], Peter GAŠPAR [2], Vladimír ĽALÍK [1]
Michal POLKO [2], Miroslav ŠAFÁRIK [1], Slavomír ŠÁRIK [2]
Štefan ŠMIHLA [2*]

Slovak University of Technology in Bratislava
Faculty of Informatics and Information Technologies
Ilkovičova 2, 842 16 Bratislava, Slovakia
`fiit.tp05@gmail.com`

Finding enough and the right people to perform small, short-term and easy tasks - process referred to as crowdsourcing - is often difficult and time-consuming. Yet, students at universities, their teachers and researchers face the problem of testing their hypotheses on adequate number of people. Companies often need to carry out small tasks which they do not need to contract, yet they can still offer some kind of a reward to those completing them. Without the support of information systems, crowdsourcing often results in calling the closest friends, acquaintances or finding strangers online on social networks or internet forums and asking them to carry out the specific tasks. This, however, brings up some risks. To mention only a few, it is uncertain whether enough people can be found and more importantly - whether the people found are truly competent to the tasks specified. Another risk is motivation without which the quality of the results might be questionable.

Crowdsourcing and crowd work industry have become more and more popular over the last 10 years with a large growth potential in the future. There are several crowdsourcing platforms to this date, each of which specializes in a different area and has its own pros and cons. The most popular one is Amazon Mechanical Turk, which provides marketplace mostly for Human Intelligence Tasks and information retrieval. Despite its popularity, Mechanical Turk does not include user/author rating or discussion about the tasks without the use of third-party browser plugin or forum. Another popular system is Crowdflower data collection and enhancement platform focused primarily on business customers, which can be quite pricey for students. Other systems include domain specific systems like TaskRabbit, which provides help with cleaning, assembling furniture or moving, or Gigwalk specializing in retail execution.

Our goal is to make crowdsourcing easier, more reliable and less time-consuming for students, researchers or companies. Therefore we have developed our own crowdsourcing system from scratch - Crowdex - which we describe in this paper. Our system addresses some of the aforementioned issues, mainly the lack of user rating and feedback and availability of such systems to students. To keep the system as simple as possible, we have defined a lifecycle of the task, dividing it into four different steps: (1) Creating a task, (2) Obtaining participants, (3) Task realization and (4) Task evaluation.

Firstly, a user creates a new task simply by giving it a concise name and description and by setting up its parameters afterwards. These include user requirements (e.g. age or specific skills),

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specifying the start and finish dates, uploading a file attachment (e.g. application to be tested) or even creating custom questionnaires which gives the author ability to ask several types of questions including selectable, multiple-choice or fillable inputs. To make the results easier to evaluate, our system provides an option to view them in a form of graphs and aggregated statistics. If desired, results can be downloaded as a CSV file. After the task has been published by its author, it is made available to the other users of the system and the second step (obtaining participants) may follow.

To leave the decision of who to accept to complete the task to its creator, other users are only able to apply for it. Eventually, the creator decides whether to accept or reject the applicant. To make the decision easier, Crowdex offers several ways how to learn more information about potential participants. The most significant are user profiles which in addition to the basic user information also provide their reputation and skills. Skills characterize user knowledge and abilities which can be used to tell if the task is suitable for user. In addition to standard Crowdex account we also support login via Academic Information System of the Slovak Technical University. In this way, retrieval of users' skills is not only automatic but reliable too.

Once the task realization step begins (determined by the start date or by meeting custom requirements), approved participants are expected to complete the task by following the author's instructions. After the task completion users are evaluated and rewarded by the author. Our goal was to make a reward system as transparent as possible therefore the author has to decide which results he will accept or reject. Shall the author accept the results, he has an option to reward the user with Credit - our own virtual currency - which can be redeemed for various items (vouchers or promotional items such as pens, key rings, etc.) in a built-in e-shop. We believe that with this system, most of the users will be satisfied with the obtained reward and will be motivated to regularly use our system and participate in various tasks.

To make the features described above widely available and to keep the system platform-independent, we have decided to develop it as a web application powered by Ruby on Rails framework. We have also focused a lot of our attention to the graphical user interface - we have used well-known frontend frameworks like Bootstrap and jQuery and implemented some of the Google Material design principles. This enabled us to bring responsive and flexible design to the most of users and their devices.

User profile information along with the data of users' activity could be further used to implement a recommendation system which could not only recommend potential participants to the task authors but also recommend specific tasks to the users themselves. To extend support for multiple task types, we plan to enhance Crowdex by implementation of eye-tracking technologies. With the support of eye-tracking, not only results, but also the process of solving the task can be evaluated which is not used in any of today's crowdsourcing systems.

The main contribution of our work is the new innovative approach in crowdsourcing with a great emphasis on users' motivation to participate. We believe this is the key for successful and popular system, enjoyed by both participants and task authors. During the development of our system we have taken the openness and ease of use of Amazon Mechanical Turk and precise and reliable data collection of Crowdflower. We have then further improved it with built-in user rating and feedback and custom e-shop for redeeming rewards. In the future we plan to incorporate recommendation system and eye-tracking technologies, neither of which have been used in crowdsourcing systems before.

References

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