# Tailoring the Task to the Crowd-Workers in Crowdsourcing Environments to Reduce the Abandonment Rates

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## Abstract

The Purpose of Research

In recent years, there has been a growing trend of using Crowdsourcing systems (Howe, 2006) that enable the execution of both large and small projects. When projects of a global nature are carried out quickly, relatively efficiently and at a relatively low financial cost, they were carried out by the companies themselves while using the company's employees.

These projects typically allow for cognitive overload and a low level of complexity. But at the at the same time, they have a high level of objectivity and can be verified, hence their great advantage. Due to the global nature, we are dealing with the dropout phenomenon of mass outsourcing workers while performing the sub-tasks.


Abandonment of these employees while performing the task causes delays and additional costs for the end customers (The client who order the job) and directly harms the employees themselves (the task performers) who are not rewarded for performing the task if they have not completed it. As stated, the injury is manifested in the following ways:

1.      Delayed schedules - because of the abandonment of the task by the crowd-workers during the process, unnecessary delays are carried out which lead to unexpected delay of the original schedules and unexpected challenges to complete the task.

2.      Financial damage - outsourcing workers who abandoned the tasks prior to its completion, are directly influenced, as they become as not eligible to receive their financial remuneration, in

addition, their personal ranking at the crowdsourcing environment is decrease (the rating system), as well as the matter causes frustration to both sides.

3.      Failed targets - is caused as a direct result of the unexpected delays and an increase in the number of outsourced mass outsourcing workers.

To solve the problem described, we propose in this study a new method which is based on the principle of identifying the target audiences (end users) and their various features dynamically in distributed systems and adapting the content to which they are dynamically exposed and according to their personal characteristics.

The method include:

1.      Proposing new prediction method - Building a new method for end-user's activity prediction for distributed systems, focusing on the selected domains which at the crowdsourcing environment, by using the Amazon's Mechanical Turk system.

2.      Persona Model – Creating new method that use the persona model as a proposed method for grouping the users' characteristics into new segmentation method. Those segmented groups are in this research the "representative groups" that are reparents the "real user" who take actions at the proposed trails.

3.      Creating new action Patterns – creating a new set of "actions patters" to identify the users' characteristics and improve the association of those users to the "representative groups". This is conducted by monitoring the users' actions while using the keyboard and mouse at the various tasks.

## The Research Method

The proposed research method is a quantitative research method with a purposed two quantitative experiments in different domains.

The domains are:

1.       Puzzle experiment

1.1.     Participants - The number of participants - 684

1.2.     Experimental group – the experimental group includes participants who started sub-task 1, including those who drop out and finished the task - 282

2.       Audio file transcription experiment

2.1.     Participants - The number of participants - 428

2.2.     Experimental group – the experimental group includes participants who started sub-task 1, including those who drop out and finished the task - 230

In total the number of participants in both experiments were - 1112 participants and the total size of the experimental group was – 512.

## The Experiment Definition

The experimental steps include the following steps:

1.       Completion of the user's-questionnaire by the participants

2.       Identifying the user characteristics and associating him to the representative group the persona

3.       Identify the users' actions of the "real experimental user" and build "action scenarios"

4.       Identify end user actions in the experiment phase and associating them to the automated representing persona. Named as Automated Persona Generation (APG)

5.       The correction phase – if needed, correcting the association of the representing group according to the results of the algorithm. The conditions and the operation of the algorithms are explained in detail in the relevant chapter.

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6.      "Enriching" the skeleton personas defined in the planning phase - enriching the collection of features defined in the planning phase with real features identified in the experiment.

## The Research Test Method

The research process includes examining the results of the of the first experiment and its success in reducing the "percentage of abandonment" of the experimental-users and the examination of the results of the second domain, that includes different characters and requirements. To prove the strengthen the conducted quantitative study, a statistical test will be performed by using a "Chi square" X2 test. The results of test will determine the success of the proposed study.

## The Tasks Definition

In this study, two different types of experiments are used, both in different domain. The types of the experiments are:

1. Puzzle

2. Audio Transaction

## The Experimental Results Definition

The experimental included a few phases including: The initial phase where the user was transferred from Amazon's crowd-sourcing system (MTurk) to the experimental environment.

At the first phase the user was exposed to the game instructions, including an explanation of the system and the experimental phases and the threshold for financial reward.

In the next step, the user was required to fill out a demographic questionnaire that was used in this study as a tool for the initial classification of the user into the representative persona. In

cases where users have completed all the sub-tasks and met the threshold for receiving the monetary reward (correct return on 60% of the sub-tasks), the ability to click on a link has been opened for them which has returned them to Amazon's crowdsourcing system for the monetary reward.

Examining the results of the experiments performed, it was found that in the experiment of the Puzzle, 684 participants where vaticinating and out of them 254 participants completed the experiment, which means that a total of 67% of the participants abandoned the task at some point. This is consistent with previous studies that have mentioned the abandonment issue on the platform.

Examining the results obtained in this experiment, several statistical tests were performed using chi-square (X2) technique. A statistical significance p = 0.038 was obtained, in terms of the dynamic order versus the other three suggested orders.

The results where:

X2 (1), Value = 4,295, p = 0.038

It appears that there is a relationship and statistical significance between the order of presentation of the sub-tasks and the abandonment percentages of the experiment participants. In other words, it cannot be argued that the abandonment percentages in one order are smaller than another order (because there is no statistical significance). Evidence of this is that in the dynamic order the abandonment rates were significantly smaller than in the other orders.

In the additional experiment of transcript, the audio file out of about 428 participants, only about 204 participants completed it, which means that a total of 52% of the participants abandoned the

task at some point. It is like results found on previous domain where the abandonment rate was 63%.

In the chi-square test performed of the abandonment obtained in the experiment, a significant difference was found between the Random order and the Dynamic order in the percentage of dropouts. This percentage was lower among Dynamic compared to Random, where p = 0.037.

The results where:

X2 (1), Value = 4.333, p = 0.037

This means that it can be argued that the order in which the sub-tasks are presented to the user in the crowdsourcing systems is significant and influencing the percentage of abandonment. In addition, it can be argued that by using the dynamic method proposed in this study it can be reduced.

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