



## TASK PRICING FOR "PHOTOGRAPHING TO MAKE MONEY"

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### ABSTRACT

Task pricing problem for "Photographing to Make Money" problem is discussed in this paper. Multiple analysis methods such as inductive summarization method and regression analysis method are used to establish the multiple linear regression models and pricing model. And the demand-oriented method, member perception value model, qualitative and quantitative are also used to analyze the task pricing rules, and then a new pricing plan is given.

Keywords: Pricing; Demand-oriented pricing model; Member perception value model

### Introduction

"Photographing to make money" is a self-service mode under the mobile Internet. The user downloads the APP, registers as a member of the APP, and then receives the task that needs to be photographed from the APP (such as going to the supermarket to check the shelf of a certain product), and earns the rewards that the APP has calibrated for the task. This mobile Internet-based self-service labor crowd sourcing platform provides enterprises with various business inspections and information collection. Compared with traditional market research methods, it can greatly reduce the cost of investigation, and effectively ensure the authenticity of survey data and shorten the investigation. Therefore, APP becomes the core of the platform

operation, and the task pricing in APP is its core element. If the pricing is unreasonable, some tasks will be left unattended and lead to the failure of the commodity inspection.

### Present Situation in Foreign Countries

Foreign researchers [1-3] such as Robso, Wikipedia, Rew, Brabham DC, Jouret U, Vukovic M, Alborsa, Hervas, etc.; Lakhani et al. studied the motivations of the winners of InnoCentive.com, a crowdsourcing website that solves scientific problems, It is pointed out that monetary rewards in InnoCentive.com are the most important factor in attracting participants to participate. Foreign experts on the crowdsourcing task pricing problem model is similar to the online decision algorithm, which in some respects conforms to the theoretical

model of reinforcement learning in machine learning. This balance is also often referred to as the multi-arm gaming machine problem. The algorithm that experts implement on the crowd sourcing website v Worker is called Trial sourcing: under the condition of budget, first assign a task to each project applicant, select the applicant with the highest quality/cost ratio, and assign as much as possible to its task. Is the implementation of a greedy algorithm.

### Domestic Research Status

Domestic researchers[4,5] such as Zhang Libin, XieXuyang, Ye Weizhen, Tan Tingting, Lu, Wei Weicheng. Although crowd sourcing attracts a lot of attention from companies, governments, and the media, few scholars have empirically studied the behaviors and motivations of individuals in crowd sourced environments, and their research focuses on crowd sourcing business models. The impact of rewards or rewards provided by the business to the participants on the behavior of the participants. Zhong Qiuyan . conducted an empirical study on the factors affecting the continuous participation behavior of Witkey on the Pig Bajie Online. Their research shows that having fun can indirectly have a significant impact on the participation behavior of Witkey.

### Task pricing law

Recommended font sizes are shown in Table 1. Through the actual location of the task and the completion of the data of the completed task data, the software can be used to draw the data to analyze the data, and the number of completed and unfinished tasks of different cities can be obtained:

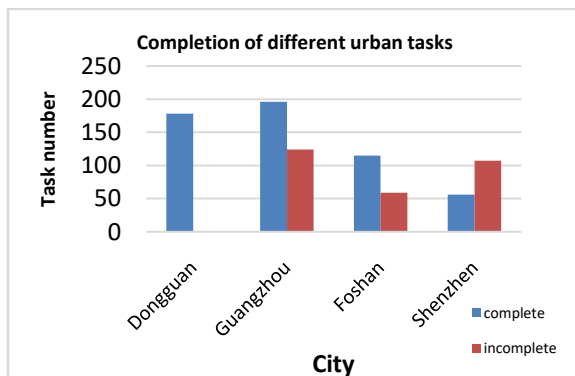


Fig. 1 Completion of tasks in different cities

It can be concluded that the tasks assigned to Dongguan City are all completed. The number of completed cities in Guangzhou and Foshan is greater than the unfinished quantity. The number of completed cities in Shenzhen is half of the unfinished quantity, which can be used to assign tasks in different cities. Pricing is very different.

Using the software to filter the price, you can get the price range of the task: 65-85 yuan, a total of 23 price values. Combined with the task completion status of each city in the mission area, the number of unfinished tasks of different prices in each city can be obtained.

Table I: Papers Statistics of unfinished tasks in cities at different prices

Price	Foshan	Dongguan	Guangzhou	Shenzhen	Total
65	1	0	24	5	30
65.5	14	0	33	27	74
66	12	0	17	28	57
66.5	2	0	8	18	28
...	...	...	...	...	...
67.5	0	0	3	3	6
68	2	0	2	1	5
80	0	0	3	1	4
85	1	0	0	2	3

It can be concluded that in addition to the completion of all tasks in Dongguan, the number of unfinished tasks in each city gradually decreases with the increase of the task price, reflecting that the pricing of the task is proportional to the completion of the task of the city. In addition, in the case of the same price, the number of unfinished tasks in Shenzhen is greater than the unfinished number of Foshan and Guangzhou, reflecting that different city mission pricing is different.

The total amount of tasks corresponding to different task prices is not completed. Using software mapping, the relationship between different price ranges and the number of tasks is as follows:

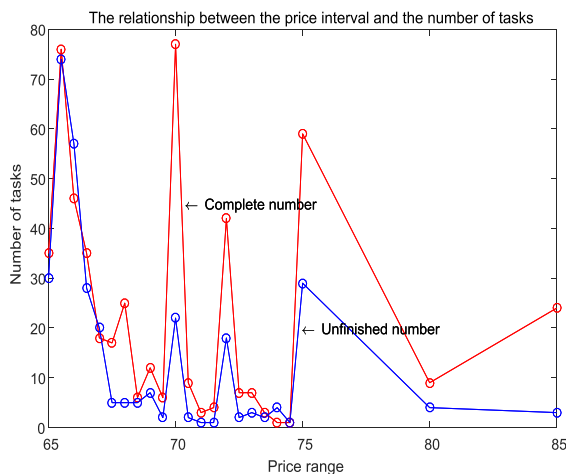


Fig. 2 Relationship between price and number of tasks

Whether the completion of the task is closely related to the pricing of the task, and the price of the task is lower, which may lead to the completion of the task. According to the data in Annex I, after using the statistical screening, the number of unfinished people at different prices is obtained, and the unfinished task is obtained. The total amount. Compare the number of unfinished tasks for different prices to the total unfinished quantity as a price influencing factor :

$X1 = \text{Unfinished quantity} / \text{Number completed}$   
Different prices, the completion of different cities is different, the reason for the city's unfinished tasks is considered to be the city that has completed the task is far from it, cannot help it to complete the task, is not completed by the location-affected task. Compare the total number of city members who have completed the task at each price to the total number of members:

$$X2 = \text{Number of completed members} / \text{Total number of members}$$

The difficulty of different tasks may result in the incomplete tasks. The higher the member's reputation, the higher the priority is to start the task selection, and the higher the quota, but some members have high credibility but their quotas are relatively small, and such members are not considered to be due to the difficulty of the task carry out. Thus, the booking task quotas of members of cities with different price outstanding tasks are compared with the member reputation values:

$$X3 = \text{Booking task quota} / \text{Member reputation value}$$

From the scatter plot of price factor, location factor, task difficulty factor and task unfinished factor, the task is not completed and the linear relationship between price, location and task difficulty is obvious. Therefore, multiple linear regression model is established to calculate various factors. The extent of the impact on the cause of the unfinished task

$$y = -1.5815 + 59.3886x_1 + 40.5594x_2 + 44.334x_3$$

According to the obtained variable coefficients of the multivariate linear equation, it can be concluded that the main reason for the unfinished task is that the price pricing is too high, and the secondary reason is that the members are far away from the task and the task is relatively difficult.

### Task pricing plan

Demand-oriented pricing [6-8] is a method of determining the price of a service according to the needs of the market, satisfying the needs of the customer while stimulating market consumption, and formulating the price based on the consumer's understanding of the difference in the value of the commodity. The demand-oriented pricing method mainly considers the demand price elasticity coefficient of the task, Assume that the price before the price adjustment is  $p_0$ , Then the pricing formula is as follows:

$$p = \frac{1}{2} \left( 3 - \frac{1}{|Ed|} \right) p_0$$

The percentage change[9] in the demand for the task caused by a 1% change in the price of the task over a certain period of time is the price elasticity of the demand price:

$$Ed = \frac{Q}{M}$$

According to the location of the mission, the tasks are divided into four regions: Guangzhou, Shenzhen, Dongguan, Foshan, and the location information of the members. Using software to filter statistics, you can get the total number of tasks in each zone and the total number of scheduled limits for each zone member, as shown in the following table:

TABLE III: Total number of tasks in different districts and member reservation limit

	Guangzhou	Shenzhen	Dongguan	Foshan
Number of limits	4404	3090	2629	1937
Total number of tasks	318	164	177	175

The predetermined number of quotas is taken as the maximum amount required, and the total number of tasks is the starting amount of demand, so the percentage change of demand is:

$$Q = \frac{q_1 - q_2}{q_1}$$

Since the change of the task will affect the member's choice of tasks, which affects the member's demand for the task, the percentage of factors affecting the price change mainly includes the price influence factor, the location influence factor, and the difficulty of the task. According to Annex I The data given, using software to filter out the influencing factors of each district are as follows:

TABLE III: Price impact ratios in different districts

	Guangzhou	Shenzhen	Dongguan	Foshan
x1	0.3993	0.4121	0.1884	0
x2	0.1684	0.4785	0.2634	0.843
x3	0.2181	0.3767	0.5732	1.0132

The percentage of factors affecting price changes is the sum of the percentages of the factors affecting each price. Therefore, the percentage of factors affecting price changes in each district is:

$$M = x_1 + x_2 + x_3$$

When a member faces a new task pricing plan, will he choose this task directly, depending on the perceived value of the task for the member. When the perceived value is greater than 1, the member is more sensitive to the task after the price adjustment, and the task is not accepted. At the same time, when the mission-aware value is less than 1[10,11], the member does not exclude the task after the price adjustment, and is more acceptable. Therefore, based on the tendency of the

task price and membership to complete, establish a member perception value model.

$$CPV = \sum_{n=1}^{\infty} x_i v_{in}, \quad i = 1, 2, 3$$

When the value of the CPV[12,13] is greater than 1, the task after the price adjustment is not accepted by the member, and is recorded as 0; when the value of the CPV is less than 1, the task after the price adjustment is accepted by the member and recorded as 1.

TABLE IV: Total number of tasks in different districts and member reservation limit

	Guangzhou	Shenzhen	Dongguan	Foshan
Q	0.9278	0.9469	0.9327	0.9097
M	0.7858	1.2673	1.025	1.8562
Ed	1.1806	0.7471	0.9099	0.4900

In summary, the price after the price adjustment [14] is:

$$p = \frac{1}{2} \left( 3 - \frac{1}{\frac{(q_1 - q_2)(x_1 + x_2 + x_3)}{q_1}} \right) p_0$$

Comparison of task pricing schemes

The cost of the number of tasks that have been executed by the task is added as the task cost of the original solution area. Similarly, the software calculates the task cost of the improved solution area. The calculation results are as follows:

TABLE V: Task cost price calculation

Guangzhou	Shenzhen	Dongguan	Foshan	Total
9117.06	7244.87	6006.60	7944.79	30313.33
Guangzhou	Shenzhen	Dongguan	Foshan	Total
2252	3879.997	3392.74	8358.5	16255.24

Use the software to calculate the original program area and improve the task completion rate of the area to complete the original program area, and calculate the task completion rate of the improved program area. The calculation results are as follows:

TABLE Vi: Task cost price calculation

Guangzhou	Shenzhen	Dongguan	Foshan
60.35	20.25	100	66.25
Guangzhou	Shenzhen	Dongguan	Foshan
40.24	80.27	58.36	66.25

It can be clearly seen that the completion rate of the task in Shenzhen has been greatly improved, indicating that the new pricing plan can improve the completion rate of the task, and the completion rate of the original program task is 0.6322, and the completion rate of the improved plan is improved. The calculation, which is 0.6674, illustrates the pricing of the new mission and facilitates the completion of the mission.

### Conclusion

Based on the related factors such as the price, location and difficulty level of “photographing to make money”, this paper analyzes the influencing factors from the qualitative and quantitative perspectives through the theoretical framework, and establishes a multiple linear regression model. According to the data analysis, it can be concluded. The main reason for the unfinished task is that the price pricing is too high. The secondary reason is that the members are far away from each other and the task is relatively difficult. Starting from the factors that have a greater impact on the completion rate of the “photographing and making money” task, since the price change will have a great impact on the member's choice of tasks, and thus have a greater impact on the task completion rate, this article is in the demand-oriented Based on the related theory of the pricing model of the law, the member perception value model, etc., the actual data is used to qualitatively analyze the influence of the task attributes and the task influencing factors on the bidder's bidding behavior, and the new task pricing can be obtained. On this basis, The comparison of the original program task completion rate found that the completion rate of the task in Shenzhen has been greatly improved, further indicating that the improved plan has certain feasibility. The results of this paper will provide a reference for the task publisher, which increases the

perceived ease of use of the “photographing and making money” platform.

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