

2014

# BioTechnology

*An Indian Journal*

FULL PAPER

BTAIJ, 10(24), 2014 [15124-15128]

## Research on the cost estimation of the bidding agency

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### ABSTRACT

This paper subdivides the bidding agency's job content. The discrete-time driver and index time driver are determined according to the time driver types, the cost determination process of bidding agency is showed, and the update and upgrade of the model are discussed. The cost formation mechanism of the bidding agency is analyzed.

### KEYWORDS

Bidding agency; Cost estimation; Time-driven activity-based costing; Model updating; Cost driver.



INTRODUCTION

The service pricing of the Bidding agency is considered for more profitable or competing. The cost plus method commonly is used by enterprise in practice. This method first determine the cost base, base on which an appropriate profit is plused, the offer comes into being. Due to a large proportion of indirect costs in the bidding agency, the cost formation process of the bidding agencies are revealed by the time-driven activity-based costing.

**An estimated unit time production cost of the Bidding agency**

Taking a Case of the bidding agency, the bidding agency has eight people, usually in charge of the field work. They each work eight hours a day, working 22 days a month. In theory, each of them one month into the working time of approximately  $8 \times 22 \times 60 = 10560$  minutes. According to conventional estimates, actual production accounted ideal capacity ratio is approximately 80% (the remaining 20% are staff training outside of work, leisure time. For the machine, may have to maintenance, repair and downtime to allow actual production capacity and the ideal the difference between the situation of about 15%), the staff of each month into the actual working time of approximately 8448 ( $10560 \times 80\% = 8448$ ) minutes, a total of 67,584 minutes to the 8 people. The agency department total costs about 40,000 yuan per month (including operating direct material costs, salaries, utilities, etc.), in which the bidding preparation, opening Evaluation and Determination of the bid, successful filing class jobs (referred to bidding operations) Direct costs 3726 yuan. Doing addendum, extending addendum documents (some have, some non), these direct cost expenditure is 260 yuan. the developed contracts, to help people to sign contracts and contract bidding reported record, assist the successful bidder and the contract business negotiation unit class jobs (referred to assist job contract) direct costs 80 yuan. Indirect costs totaling  $40000-3726-260-80 = 35,934$  yuan. These three job categories were estimated monthly workload 6 the results of the bidding operation, four times Addendum job ,contract to assist the job in twice.<sup>[1]</sup>

Costing direct costs 621 yuan every job in the traditional bidding calculated, every addendum job direct costs 65 yuan, 40 yuan for each contract to assist the job. Time-driven activity-based costing by calculating the cost of production per unit time when the job does not include the direct costs. The indirect costs of the bidding agency for  $35934 \div 67584 \approx 0.53$  yuan / minute.

**Estimated the number of unit time in bidding agency jobs**

In fact, you can see that the bidding agency sector this month only about 72% ( $48720 \div 67584 = 72\%$ ) of the actual capacity can be effectively utilized in table 1.

**TABLE 1: Time accounting-job table (monthly) (min,¥)**

job	(1) The number of jobs per unit of time	(2) Workload	(3) The number time= (1) × (2 )	(4) total Indirect of sharing= (3) ×0 .53	(5) cost- Direct material costs	(6) cost= (4) + (5) The total
Bidding job	6200	6	37200	19716	3726	23442
Addendum jobs	2400	4	9600	5088	260	5348
Contract to assist job	960	2	1920	1017.6	80	1097.6
Total	9560		48720	25821.6	4066	29887.6

**TABLE 2: Time-driven activity-based costing data table (min,¥)**

Job	(1)The unit cost of direct materials	(2)The number of jobs unit time per of	(3)Production costs per unit of time	(4)Cost Driver unit cost	(5)Workload	(6)The total number of hours spent	(7)=(1)×(5)+ (6)×(3) Total cost sharing
Bidding job	621	6200	0.53	3907	6	37200	23442
Addendum jobs	65	2400	0.53	1337	4	9600	5348
Contract to assist job	40	960	0.53	548.8	2	1920	1097.6
Capacity utilization						48720	29887.6
Providing total capacity						67584	40000
Unused capacity						18864	10112.4

In this sector,

Cost Driver unit costs for the Bidding jobs:  $6200 \times 0.53 + 621 = 3907$  (yuan)

Cost Driver unit costs for the Addendum jobs:  $2400 \times 0.53 + 65 = 1337$  (yuan)

Cost Driver unit costs for the Contract to assist job:  $960 \times 0.53 + 40 = 548.8$  (yuan)

In the sector, the cost of the bidding agency resources, in which untapped capacity the month incurred to 10,112.4 yuan (see table 2), it provides data for reference to cut costs for bidding agency.

In the total 35,934 yuan indirect costs , only about 75% ( $29887.6 \div 40000 \approx 75\%$ ) is allocated to the bidding agency business this month, revealing the efficiency ills in the bidding agency .

**The update of the bidding agency model**

The first case: Because of the change in bidding agency resource input prices, resulting in production cost per unit time of the resource has changed. For example, the bidding agency staff salaries increased by 8%, if indirect costs only includes staff salaries, the unit cost of the resource cost drivers from 0.53 yuan per minute up to 0.5724 yuan ( $0.53 + 0.53 \times 8\% = 0.5724$  yuan). If a bidding agency process replaces or adds a new bidding agency job project , department or agency bidding agency for the bidding agency also needs resources unit cost cost drivers to make adjustments to reflect changes in costs related to the bidding agency. The difference costs can reflect the change of the costs, therefore, focusing on considering the difference costs. For example, suppose the above bidding agency add a new bidding agency job activities, purchase new equipment, and 8 percent salary increase to strengthen project transactions in the require of the higher authorities. The original total wages for bidding agency are  $8 \times 3000$  yuan per person = 24,000 yuan each month. The required time for new business is 60 minutes. There is no direct material costs, other conditions remain unchanged. The newly purchased bidding agency equipment, the original value of the equipment is 6,000 yuan, the estimated net salvage value for 300 yuan, six-year depreciation period. The difference cost before and after the change of the bidding agency department, the bidding agency productivity costs per unit of time and additional bidding agency activity cost driver units costing in below<sup>[2]</sup>:

Monthly increase salaries for bidding agency= $24000 \times 8\% = 1920$  yuan

Monthly increase salaries for bidding agency apparatus, equipment depreciation =  $[(6000-300) / 6] / 12=79.17$  yuan

Monthly total difference cost= $1920 + 79.17 = 1999.17$  yuan

Increase cost per unit of time for bidding agency= $1999.17 / 67584 \approx 0.03$  yuan per minute

The new capacity costs per unit of time for the bidding agency= $0.53 + 0.03=0.56$  yuan per minute

Additional cost drivers costs for bidding agency activity= $0.56 \times 60=33.6$  yuan

Of course, the cost driver unit costs for the original three bidding agency job activity also need to be adjusted accordingly to table 3:

**TABLE 3: Changes in cost drivers unit costs caused by changed resource (min,¥)**

Job	(1)The unit cost of direct materials	(2)The number of jobs per unit of time	Before the change		After the change	
			(3)Production costs per unit of time	(4)Cost Driver unit cost	(5)Production costs per unit of time	(6)=(5)×(2)+(1) Cost Driver unit cost
Bidding job	621	6200	0.53	3907	0.56	4093
Addendum jobs	65	2400	0.53	1337	0.56	1409
Contract to assist job	40	960	0.53	548.8	0.56	577.6
New business activity	0	60	0	0	0.56	33.6

The second situation: If the efficiency of a bidding agency activities changed, the cost driver unit cost of the bidding agency activity will change. Such as, due to the use of a new database systems, the bidding work achieve online refund the bid security, drawing the deposit business. Making the time of staff that need to complete the bidding agency reduced from 6200min to 6000min. If make this improvement factors into account in the cost model, only need to complete this activity estimate the unit of time changes to 6000min,the cost driver unit cost of the bidding operation will automatically from the original time  $6200 \times 0.53 + 621 = 3907$  yuan to  $6000 \times 0.53 + 621 = 3801$  yuan. Of course, we must also consider the effect of bidding agency cost that purchase new equipment of bidding agency department, equipment. This requires make the corresponding adjustment for the procuratorial activities bidding agency production cost per unit time. In this way, the cost driver unit costs of bid invitation agency will be slightly higher than 3801.If using the bidding agency software as the new bidding agency assets, the original value is 10000 yuan, net residual value is 0,the depreciation period is 4 years, other conditions remain unchanged; the difference cost and bidding agency capacity cost per time unit of the bidding agency changes before and after as follow.

The increased amount of depreciation= $[(10000-0) / 4] / 12 = 208.33$  yuan

The difference between the total cost = the increased amount of depreciation =208.33 yuan

The increase amount of the capacity cost per time of bid invitation agency= $208.33/67584=0.003$  yuan / minute

The capacity cost per time of new bid invitation agency= $0.53+0.003=0.533$  yuan/minute

Assumptions<sup>[3]</sup>, the addenda operation time decreased from 2400 to 2340min;the contract to assist the operation time was changed from 960min to 900min,unit cost drivers of the three types of business activities in the bid invitation agency department need to change(see table 4).

**TABLE 4: The change of cost driver unit cost caused by activities efficiency change (min,¥)**

Job	The unit cost of direct materials	Before the change			After the change		
		The number of jobs per unit time	Producti on costs per unit of time	Cost Driver unit cost	The number of jobs per unit of time	Productio n costs per unit of time	Cost Driver unit cost
Bidding job	621	6200	0.53	3907	6000	0.533	3819
Addendum jobs	65	2400	0.53	1337	2340	0.533	1312.22
Contract to assist job	40	960	0.53	548.8	900	0.533	519.7

If the bidding agency to update operation cost model based on the project rather than the cycle time (once a month or a year statistics) that can more accurately reflect the current situation of bidding agency. As long as the cost analysis staff of bid invitation agency to understand the need to complete a bid invitation agency activities that the bid invitation agency resources, the bidding agency cost of resources, or these resources bidding agency in practical production capacity occurred significant changes. They can accordingly re-estimate these bidding agency resources cost unit time, or the bid invitation agency unit cost driver<sup>[4]</sup>. The same, once they learn the long-term, large efficiency changes of a bidding agency job activity, they will update the number of time units of the bidding agency activity.

**Model updating**

In the above analysis, do not take into account the actual procuratorial work activities, the situation may be varied, this involves the issue about model upgrade. There are two possible causes:

The first situation: Under different work modes of the same bidding agency content, The bid invitation agency resources of procuratorial work consumption are the same, The difference is bidding agency under different operation mode, The bidding agency job consumption per unit time number is different; which led to cost driver unit cost changes in bidding agency. Under normal conditions, the bidding job text changes formed on the basis of the format file, and the standard process, the required operation unit time number is 6200min;If it is a special project and needing a lot of words and the description of the input, through field observation of the management, time estimation will be increased by 60min.In addition, if the special project take urgent process, time estimation will be increased by 960min.So, in this case, unit times of activities which the bidding work needs can expressed by the following equation<sup>[5]</sup>:

$$\text{Unit times of activity} = 6200 + 60[\text{special project}] + 960[\text{special project take urgent process}]$$

Through the above equation can easily, and more precisely put the bidding agency cost to different types of project, to implement the special links cost of bidding agency.

The second situation, under the different ways of procuratorial work, Not only the consumption of procuratorial work number per unit time is different, and the consumption resources of the bidding agency may be different, which led to cost driver unit cost changes in bidding agency. If the construction bidding need pre-qualification, sieve to only 7 bidding units, and then to organize the bid opening, evaluation, calibration and so on. In this case, post qualification the bidding job time required for 6200min,increase the pre-qualification part, time of bidding operations estimation will be increased by 480min;Then in charge of the bid security adopted the telegraphic transfer form, time estimation will be increased by 280min.

According to these information, Managers estimate the time needed to complete the project bidding work:

$$\text{Unit times of activity} = 6200\text{min} + 480 \text{ min [the pre-qualification part]} + 280 \text{ min [telegraphic transfer Bid security]} = 6960\text{min}$$

$$\text{cost per cost driver} = \text{Unit times of activity} \times \text{cost per time unit of capacity} + \text{costs per direct materials [if have]}$$

In the new model embedded time equation etc can accurately reflect different that the different characteristics of bidding agency job activity led to the unit cost of processing time difference and cost driver. To make the TDABC model based on low cost, good effect meet construction environment bidding requirements of variety of complex, the construction scale of the performance of different proxy. For the bidding agency department service pricing, the reasonable control of the bidding agency cost, the formulation efficiency improvement measures of bidding agency provide the basis of accurate data.

**CONCLUSIONS**

After determining the cost, plus a certain profit margin can get the project quotation, how to know oneself price set too low or too high? To see whether task is full, if the contract task which is undertaking is not many, the utilization degree of production capacity is low, to illustrate price is too high, should reduce the expected profit; reduce the price can take on more

tasks, in order to improve the utilization rate of resource department. Conversely, if the contract task which is undertaking is too much, production capacity use excessive, raise prices is appropriate.

### ACKNOWLEDGEMENT

Thanks to the aid fund of Ministry of Education. Thanks to Chen hong-xia' writing inspiration and stimulating thought.

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