

The Profitability Management Mechanism of Leather Industry-Based on the Activity-Based Benefit Approach

Mei-Fang Wu, Shu-Li Wang, Tsung-Yueh Lu, Feng-Tsung Cheng

Abstract—Strengthening core competitiveness is the main goal of enterprises in a fierce competitive environment. Accurate cost information is a great help for managers in dealing with operation strategies. This paper establishes a profitability management mechanism that applies the Activity-Based Benefit approach (ABBA) to solve the profitability for each customer from the market. ABBA provides financial and non-financial information for the operation, but also indicates what resources have expired in the operational process. The customer profit management model shows the level of profitability of each customer for the company. The empirical data were gathered from a case company operating in the leather industry in Taiwan. The research findings indicate that 30% of customers create little profit for the company as a result of asking for over 5% of sales discounts. Those customers ask for sales discount because of color differences of leather products. This paper provides a customer's profitability evaluation mechanism to help enterprises to greatly improve operating effectiveness and promote operational activity efficiency and overall operation profitability.

Keywords—Activity-based benefit approach, customer profit analysis, leather industry, profitability management mechanism.

I. INTRODUCTION

FACED with a fierce global competitive environment, the leather companies is driven to upraise core competencies through industry-academia cooperation. Two years previously, the case company had built up Activity-Based Costing (ABC) database, and therefore, fully understands the economic benefits and competitiveness by using the ABC database to set up the strategies for leather industry. As global fur quantities reduced sharply, leading to soaring price, the senior managers understood the need to apply better operational strategies to raise performances and increase competitive advantage. Customers of leather manufacturers are categorizes into two major groups; the brand company group, such as Clark, Nike, Timberland, and the non-brand business in domestic and abroad. The main purpose of this paper is to explore, evaluate and verify the customer's profit of the brand customers group, and the approach to sustaining competitive advantage in the global leather market.

Mei-Fang Wu is with the Department of Industry Engineering and Systems Management of Feng Chia University, Taichung, Taiwan, ROC (corresponding author, phone: +886-955-041-647; e-mail: mfwu@fcu.edu.tw).

Tsung-Yueh Lu is student of Ph.D program of Industrial Engineering and Systems Management, Feng Chia University, Taichung, Taiwan, ROC (e-mail: cs320866@yahoo.com.tw).

Feng-Tsung Cheng is with the Department of Industry Engineering and Systems Management of Feng Chia University, Taichung, Taiwan, ROC (e-mail: ftcheng@fcu.edu.tw).

II. LITERATURE REVIEW

There are ABC, Activity-Based Management, customer profit management and other related literatures.

A. Activity-Based Costing

Cooper, Kaplan extended the notion of ABC to the academia and empirical study [1]. ABC is an activity analysis method, which was developed to understand the indirect supporting costs of the decision-making or manufacturing process. The ABC model initially developed as a single-faceted model [1], while a few years' later scholars proposed a two-faceted model [2]. The single-faceted model mainly constructs the causal relationship between the product cost and resource consumption, and traces the cost objective according to the cost driver consumption of the activities [3], such as the manufacturing cost or selling and administration cost calculation. The two-faceted model is composed of two perspectives: cost allocation and procedure view. The concept of cost allocation is to extend the concept of the single-faceted model. The procedure view is to explore the causal relationship between resources consumption and activity performance.

B. Activity-Based Management

Raffish, Turney [4] proposed the model of Activity-Based Management (ABM) system, including ABC and ABM. ABM uses the ABC database to eliminate or cut down the non-value added activities to increase the operation performance by well and fit strategies [5]. The operating costs link causal relationship with the process activities and resource consumption in order to explore the sustainability and value of operating activities, and attempts to determine the reasonable profitability of enterprises [6].

C. Customer Profit Management

Enterprises analyze a customer's profitability using the ABC database. The customer's profit is various because of the interactions between customers and enterprises are different. The resources consumed during business trade activities affect the profitability of each individual customer. Foster, Gupta and Sjoblom [7] indicate that most researches focus on a product's profit only and not on a customer's profitability in the past. They highlight the five reasons that affect the customer's profitability: (1) Source of income, (2) customer's characteristics, (3) channel of distribution, (4) hierarchy of customer service, and (5) services process flow.

III. METHODOLOGY

The ABC model consists of an eight-step process. The descriptions are as follows:

Step1. Analyze and confirm the purposes of model

To confirm the purposes of the ABC system, and to build up a database of cost driver rates for manufacturing, selling and administrative activities.

Step2. Organize a working team

Members of the working team should include representatives from various departments, who can bring multiple professional knowledge and skill to discuss, analyze, and evaluate the feasibility of the ABC system. The team includes members representing the departments of marketing, administration, finance, and manufacturing, R & D, IT and so on.

Step3. Collection and analysis of basic information

After confirming the main purposes and organizing the working team, the third step is to collect data, through interviews with senior managers of marketing, administration and manufacturing to understand the status of the business activities and processes. The marketing and selling process flow are shown in Fig. 1. The top 10 customers have been selected as pilot customers for empirical study.

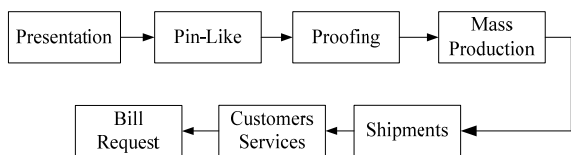


Fig. 1 Marketing and selling process flow

Step4. The first stage cost allocation and resources cost pool establishment

To link the organizational chart with financial statements for establishing resources cost centers and activities cost centers through two-stage allocation processes.

The paper categorizes operating costs into administrative and selling costs, pooled by reviewing all of the account titles in the financial statement. Some operating costs are direct variable, and some are indirect fixed. Thus, the indirect fixed operating cost needs a resources cost driver to allocate into the administrative or selling cost pool. Summarizing the direct variables and indirect fixed costs into the administrative and selling resources cost pool, is the main purpose of step 4.

Step5. The second stage cost allocation and activity cost pool establishment

The most important stage is to calculate the activity cost drivers rate for cost objectives. The second stage is the re-allocation of the resources cost pool into the activity cost pool by reviewing the causal relationship between the activity cost driver and the activity process flow of the administrative or selling process. For example, the selling resourcing cost pool re-allocates into the activity cost pools as the presentation cost pool, order conforming cost pool, order processing cost pool, shipment cost pool and customer service cost pool. The selling resources cost pool affects the customer’s profit. The activity process flow is shown in Fig. 2.

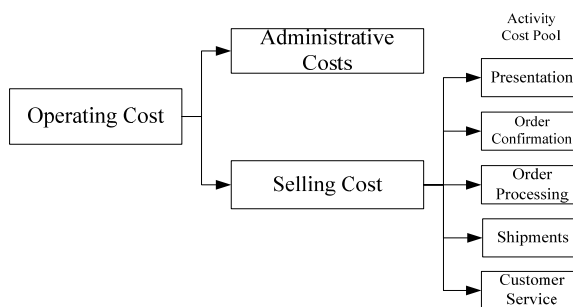


Fig. 2 Activity process flow of the selling resource cost pool

Step6. Build up selling activity cost driver rate database

The selling activity cost database of the driver rate built up on multiple cost drivers. The other administrative resource cost pool using only one activity cost driver, square feet (ft²), to obtain the activity cost driver rate. The selling activity cost drivers are listed in Table I.

TABLE I
EACH ACTIVITY PROCESS AND COST DRIVER

Resource Cost Pool	Selling Activities process	Activity Driver
Selling Process Flow	Presentation	Number of presentations for the year
	Order Confirmation	Number of orders for the year
	Order Processing	The number of open tickets for the year
	Shipments	The total square feet (sq ft) for the year
	Customer Service	The number of complaints for the year

Step7. Build up Activity-Based Customer Profit Management Model

Summarizes the seven steps previously mentioned into the ABC profit management mechanism presented below. The mechanism of a customer's gross profit is determined by (1):

$$GM_i = \sum_{l=1}^p (P_l - PC_l) \times Q_l \tag{1}$$

where: *GM*: Gross profit, *P*: Unit price of product, *PC*: Product costs of product, *Q*: Sales quantity, *l*: Product category, *l* = 1, 2, ..., *p*, *i*: customer category, *i* = 1, 2, ..., *m*.

The model of a customer's net income is determined by (2) and (3) where *OC* represents the operating cost and π represents the net income:

$$OC_i = \sum_{s=1}^t CD_s^{OC} \times CDR_s^{OC} \tag{2}$$

$$\pi_i = GM_i - OC_i \tag{3}$$

where: *OC*: Operating cost, *CD^{OC}*: Consumption number of operating costs driver, *CDR^{OC}*: Operating costs driver rate, π : Net profit, *s*: Category of operating activities, *s* = 1, 2, ..., *t*.

Step8. Verify the feasibility and repeatability of ABC customer profit management model

This paper uses empirical data from a case leather manufacturing company to verify the feasibility and repeatability of the proposed ABC model.

IV. EMPIRICAL STUDY AND RESEARCH FINDINGS

A. Company Profile

The case company is located in Zhuhai Industrial Park in China. The case company is an OEM manufacturer, exporting leather products to North America, Europe and South Asia for brand shoes customers. The company produces customized leather products for brand customers and is involved in the entire leather-manufacturing process from salt wet to leather product. Some 65% of annual sales revenues result from branded shoe companies. This paper focuses on the brand customers as a pilot empirical study.

B. Data Collection

The data were gathered from interviews with the case company's sales vice-manager and chief operating officer (COO) to gain an understanding the customers' service process status. The chief financial officer (CFO) provided the financial statement and documents of resources consumption quantities for 2016.

The steps for building the model are described as follows:

1. Confirm Resource Cost Center and Allocate into Resource Cost Pool: The case company decides to categorize cost into selling, administrative and manufacturing cost pool, and allocate cost by reviewing the account titles one by one in the income statement.
2. Confirm Activity Cost Center and Allocate to Activity Cost Pool: The case company divides the selling resource pool into five operation activity centers: (1) presentation, (2) order confirmation, (3) order processing, (4) shipment, and (5) customer service.
3. Discuss and Allocate Activity Cost Pool: The selling resources cost pool is divided into five activities cost pools. The accounting titles in the selling resource cost pool include salaries, commissions, utilities, depreciation, insurance, travel cost and so on. Some costs are direct costs, which are allocated into the order confirmation and shipment activity cost pool directly. Some costs are indirect costs that need the proper bases to allocate into the presentation cost and customer service cost pool. This indirect cost is the selling resource costs, which are equally allocated into two cost pools, presentation cost and customer service cost, by the ABC team members.
4. Identify Activity Cost Driver and Calculate the Driver Rate: After the ABC work team meeting, the cost drivers of the activity cost pool are determined as the ratio of sales revenue of a presentation activity, number of order confirmations, number of order processing, sales volumes of shipment activity, and times of customer service. The ABC work team determined customer service demands as three times per day, for 260 days working day annually in 2016. The time calculation in shown in (4):

$$3 \times 260 = 780 \quad (4)$$

The resources consumption figures for the activity cost driver and the cost driver rate are shown in Tables II and III, respectively.

TABLE II
NUMBER OF RESOURCES CONSUMPTION OF COST DRIVERS IN 2016

	Number of resources consumption in 2016
Order Confirmation	10,005
Order Processing	17,945
Shipping/Sq ft	21,021,557.5
Customer Service/Times	780

TABLE III
ACTIVITY COST DRIVER RATE IN 2016

Activity Process	Total Activity Cost Center	Consumption Number of Cost Drivers	Activity Cost Driver Rate
Order Confirmation	527,682.74	10,005 sheets	52.74/sheet
Order processing	361,058.23	17,945 sheets	20.12/sheet
Shipments	4,027,639.99	21,021,557.5 sq ft*	0.19/sq ft
Customer service	2,901,645.03	780 times	3,720.05/times

* Square feet (sq ft) UNIT: CNY, 1 USD= 6.817CNY.

C. Customer Profit Analysis

This paper selects top two brands as pilot customers for empirical study. The consumption of cost drivers' numbers for two customers are shows in Table IV. The presentation cost pool includes three items of resources consumption: (1) consultant salaries that is responsible for the brand customer design, (2) the direct cost of presentation for the relative customers, (3) the remained indirect presentation cost divided into all number of customers equally. The presentation cost allocation based on the ratio of sales revenue in 2016. The base of the customer service cost calculation is 104 times, two times per week, 52 weeks in a year, for both customer A and customer B in 2016.

By integrating the cost driver rate in Table III and the rate of resources consumption in Table IV, the paper obtains the selling cost of customer A and customer B, which are shown in Tables V and VI.

TABLE IV
CUSTOMER ACTIVITY DRIVER STATISTICS

	2016	
	customer A	customer B
Order confirmation/Sheet	1,881	391
Order Processing/Sheet	3,556	776
Shipment/Sq ft	4,983,028.4	383,664.27
Customer Service/Times	104	104

TABLE V
SELLING COST OF CUSTOMER A IN 2016

Customer A			
Cost Drivers	Activity Cost Drivers rate	Cost Drivers Consumption	Activity Cost
Presentation			64,0271.11
Order Confirmation	52.74/sheet	1,881 sheet	99,203.94
Order Processing	20.12 sheet	3,556 sheet	71,546.72
Shipments	0.19/sq ft	4,983,028.4 sq ft	946,775.39
Customer Service	3,720.05/time	104 times	386,885.2
Total selling cost			2,144,682.3

Unit: CNY, 1USD= 6.817CNY

The administration cost is calculated by selling square feet

(sq ft) per year. Net income is calculated by the sales revenue and cost of goods sold for customer A and customer B; the amounts and ratios summarized are presented in Tables VII and VIII.

TABLE VI
SELLING COST OF CUSTOMER B IN 2016

Customer B			
Activity Drivers	Activity Cost Drivers rate	Cost Drivers Consumption	Activity Cost
Presentation			190,291.23
Order Confirmation	52.74/sheet	391 sheet	20,621.34
Order Processing	20.12/sheet	776 sheet	15,613.12
Shipments	0.19 /sq ft	383,664.27 sq ft	72,896.21
Customer Service	3,720.05/time	104 times	386,885.2
Total selling cost			686,307.1

UNIT: CNY, 1USD=6.817CNY

A summary of all of the figures are presented in Table VIII, the research findings indicate:

1. Both of customer A and customer B provide positive gross margins to the case company.
2. Each transaction with customer A creates 10.27% net income rate, while the net income rate for customer B is only 2.56%. The net income ratio of customer A was five times that of customer B in 2016.
3. The high selling cost expenditure results in lower profitability for customer B.
4. The case company needs to analyze the cost structure of the selling cost to improve the efficiency of the selling process flow.

Therefore, the case company needs to revise and improve the selling cost structure, which is shown in Table IX. Comparing the cost ratio of customer A and customer B, the following improvements are suggested:

1. The highest cost ratio of customer A is shipment cost, 0.52%. The customer service cost for Customer B is 2.92%. This finding suggests that the case company needs to negotiate with customer B only once per week to reduce the customer service cost.

TABLE VII
NET INCOME OF TWO CUSTOMERS

Customer	Year	Total sales revenue	Cost of goods sold	Selling cost	Administrative costs	Net income
A	2016	183,686,367.4	152,645,919.1	2,144,682.3	10,022,180.7	18,873,585.3
B	2016	13,247,902.8	11,468,318.48	686,307.1	752,968.44	340,308.78

UNIT: CNY, 1 USD=6.817CNY

TABLE VIII
RATIO OF SALES REVENUE AND NET INCOME

Customer	Year	Total sales revenue	Cost of goods sold	Selling cost	Administrative costs	Net income
A	2016	100%	83.10%	1.16%	5.45%	10.27%
B	2016	100%	86.57%	5.18%	5.68%	2.56%

UNIT: CNY, 1USD=6.817CNY

V. CONCLUSION

This paper collects manufacturing and sales data from a case company for practical verification. The first step was to construct the ABC selling activity cost database. The second step was to establish the mechanism of customer profit

2. The presentation cost ratio is the second highest cost for both customer A and customer B. According to the research findings, the cost ratio of customer B is four times high than customer A. This paper recommends that the case company promote their design power to increase the market power of the company.
3. The third highest ratio for customer A is the customer service cost, while for customer B it is the shipment cost, at 0.21% and 0.55%, respectively. It is recommended that case company negotiate with customer B to increase the sales sq ft and sales amounts in each order sheet. In other words, the case company needs to set up and recommend a minimum sq ft for each order sheet in order to control cost drivers consumed for the purpose of cost cutting.
4. The shipment activity cost driver is in sq ft, and the cost driver rate is 0.19 CNY per sq ft for both of customer A and customer B. The cost driver rate reflects the causal relationship with sales volume and shipment cost accurately.
5. It is important to note that the cost of goods sold per sq ft for the two customer firms is very similar, 30.63CNY and 29.89CNY, while the difference in the net income per sq ft between customer A and customer B is four-fold, 3.79CNY to 0.89CNY. The selling cost discrepancy results in different net income outcomes. The higher the cost driver consumption, the more the activity cost needs to pay. Thus, the case company needs to lower the selling cost by reducing the five categories of cost driver consumption. For instance, shortening the times for the order confirmation and processing sheet will effectively improve profitability. The research findings indicate that customer A is an outstanding customer, which provided a significant contribution and profit to the case company in 2016. Meanwhile, customer B is not a welcome customer due to the excessive selling activities that result in very low net profit.

management according to the ABC database. Analyze, calculate, verify and complete the comparison by two pilot brand customers.

The research findings provide a customer profit analysis, and aids in developing better strategies for customer relationship management. The research findings indicate that customer A

has higher profit contribution than customer B, as a result of a lower presentation and customer service costs. The case company needs to improve operational performance in relation to two aspects. The first is the customer dimension, which explores the problems of (1) quality of leather product is more stringent, or (2) special requirements, which causes higher sales discounts or sales returns and allowances. The second aspect is the process dimensions of: (1) customer B requires more process activities, which results in higher consumption of cost drivers, or (2) high quality requirement results in a lower yield rate. The low yield rate drives higher sales discounts and also more sales returns and allowances.

TABLE IX
SELLING ACTIVITY COST RATIO OF TWO PILOT CUSTOMERS

2016		
	Customer A	Customer B
Presentation	0.35%	1.43%
Order Confirmation	0.05%	0.15%
Order Processing	0.04%	0.11%
Shipments	0.52%	0.55%
Customer Service	0.21%	2.92%

UNIT: CNY, 1USD=6.817CNY

This paper builds a research procedure of customer profit management with the selling and administration ABC cost database to contribute precise cost and net income information for all leather products and brand customers.

REFERENCES

- [1] Cooper R, Kaplan RS. How Cost Accounting Distorts Products, *Management Accounting*, 20-27 (1988)
- [2] Turney PBB, *Common Cents: The ABC Performance Breakthrough*, Hillsboro, Ore, Cost Technology Published. (1991)
- [3] Carsten H. Improving activity-based costing heuristics by higher-level cost drivers, *European Journal of Operational Research*, 157(2), 332-343(2004).
- [4] Raffish N, Turney PBB, Glossary of activity-based management, *Journal of Cost Management*, 53-63. (1991).
- [5] Cooper R, *Activity-Based Costing for Improved Costing*, Handbook of Cost Management, B1. Boston: Warren, Gorham & Lamont. (1992).
- [6] Barnes, IEs Can Improved Management Decision Using Activity-Based Costing, *Industrial Engineering*, 44-50, (1991).
- [7] Foster, G, M. Gupta, and L. Sjoblom. Customer profitability analysis: challenges and new directions, *Journal of Cost management*, 10, 5-17(1996).