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## THE INFLUENCE OF THE COST-TO-SERVE METHODOLOGY ON CUSTOMER PROFITABILITY

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**Summary:** The article covers the subject of the Cost-to-Serve as a costing method. There are customers providing little profits to the enterprise and some that even generates a loss. Cost-to-Serve is a tool allowing for optimising costs to make every customer profitable. In the first part of the paper covers the whole concept and emphasise its main areas. The second part shows how Activity Based Costing may be used as a sub process to the CTS analysis. The third part focuses on the Customer Profitability Analysis (CPA) for the Cost-to-Serve methodology. The paper contains the example of applying the Cost-to-Serve. It uses results of the research conducted in the Brazilian food industry to present how the Cost-to-Serve affects real costs. The article ends with conclusions concerning the Cost-to-Serve concept and its further perspectives.

**Keywords:** Cost-to-Serve, customer profitability, customer-based costing, empirical example.

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### 1. Introduction

Modern cost calculation methods provide more in-depth information and allow for making precise analysis. This article focuses on the Cost-to-Serve methodology which is rarely undertaken subject in Polish literature. This is due to the fact that Cost-to-Serve is known to be a practical approach.

The purpose of the paper is to present the Cost-to-Serve concept and its core. The authors show areas that Cost-to-Serve covers and specify how the Activity Based Costing may be used as a sub process in CTS analysis. Customer profitability analysis is another aspect of this article. Cost-to-Serve being a customer-driven concept may be efficiently used to analyse customer profitability. As a method of cost calculation it allows to optimise the profitability on each customer. This leads to the last part of the article where the Cost-to-Serve is presented on an empirical example. The research conducted in Brazil is a perfect example of how CTS influences real costs

and the profitability in each of the supply chains. The results of the research prove that Cost-to-Serve may be a very effective method in optimising enterprise's margin.

The behaviour of customer cost is a specific phenomenon. Some relationships may require customer distinct investments and a higher level of service. This in turn may create more cost to the enterprise than the potential income impacting the profitability of the enterprise. Cost-to-Serve is the key for understanding how efforts affect profits. Understanding the appropriate use of the Cost-to-Serve approach creates a wide spectrum of possibilities to optimise the revenues of the enterprise.

## 2. Cost-to-Serve methodology

A broad group of scientists analysing costing methods with Kaplan and Cooper [1998] at the forefront indicate Activity Based Costing (ABC) as the most proper method for determining customer-service costs. This statement covers enterprises with composite product, service requirements and a customer.

This may be considered an endorsement but ABC methodology after more than a decade of a slow growth and systematic implementation had been achieving greater acceptance as a marketing and logistics cost accounting tool. Moreover, the effectiveness of ABC in this area has been confirmed in many empirical examples, which is described in more detail by Lambert and Burduroglu [2000] or Cokins [2003]. The sphere of allocating costs to products and customers utilising Activity Based Costing is presented on two activity levels – micro-activities and macro-activities. Such model in a relatively simple way links ABC system with assessing marketing costs on each product line and its influence on the structure of profitability.

Cost-to-Serve is a different and definitely less popular methodology of customer-service cost accounting method. It is important to search through typical areas of data enquiry in CTS analysis to understand Cost-to-Serve method. These areas may be divided into four master groups – master files, operating costs, distribution costs and outsourcing costs.

Product master file includes product groups, standard manufacturing costs and physical characteristics in units. Customer master file includes references, groups and the geographical distribution of customers. Suppliers and manufacturing master file contains data of geography and lead time by product. Hub master file besides geography includes the list of products docked in each of held hub (which can be located at manufacturing sites). Next categories are connected to the variable of time. Sales data at a transaction level are standardised with the period of time which is 3–6 months. It contains order and shipment numbers, product codes, quantity ordered and delivered, hub and customer references. Sales data required to implement Cost-to-Serve are gathered weekly for a period of a year. It allows for understanding seasonality and capacity requirements for hubs and outbound freight. Inbound data at transaction level, on the other hand, aggregate order number, product code, quantity,

supplier and manufacturing or hub reference. Typical period of time in this case is 3–6 months. The last item in master files is inventory data including product code, number of units in stock and hub reference [Braithwaite, Samakh 1998, p. 79].

The second of master groups is operating costs, which is required for Cost-to-Serve analysis. It contains [Braithwaite, Samakh 1998, p. 79]:

- fixed costs – rent, rates (electricity, gas, local taxes, maintenance, water, etc.), indirect salaries fully loaded (including such categories as pensions or company cars), overheads calculated for each facility,
- financial costs – building depreciation, computer depreciation, capital cost of holding the inventory, product obsolescence,
- variable costs – direct salaries fully loaded, equipment running costs and depreciation.

Third master group category is distribution costs [Braithwaite, Samakh 1998, p. 79]:

- fixed costs – indirect salaries fully loaded and overheads for each facility,
- financial costs – truck depreciation,
- variable costs – drivers salaries fully loaded, fuel.

The last category contains outsourcing costs [Braithwaite, Samakh 1998, p. 79]:

- warehousing rates – RH&D, cost/pallet/week, administration,
- transportation rates – cost/pallet/week,
- capacity constraints – manufacturing/warehousing/distribution.

Bearing in mind the areas Cost-to-Serve covers, gives a possibility to understand the point of CTS. Traditional cost-determination systems do not create possibility for analysis of individual customer performance in enterprises with a wide range of products. This is due to the contribution margin that does not permit the identification of each factor determining the profitability of distribution channels. Cost-to-Serve methodology allows for such recognition. Calculating costs using CTS permits to discern drivers for change such as variety cost, customer-channel management, customer-service objectives, company supply structure, commercial price policy and functional costs and staff remuneration [Guerrerio et al. 2008, p. 394].

Cost-to-Serve may be defined as the total pre-sale, order related, distribution and post-sale service cost required to maintain an ongoing exchange relationship with a customer firm. It also refers to a quantitative, financial-driven methodology analysing how costs are consumed throughout the whole supply chain and estimating the profitability of products, customer and marketing channels. The main purpose of this method is to optimise enterprise's profitability. The concept of Cost-to-Serve includes relevant logistic and financial costs related to individual customers and this makes it more complex than customer-specific marketing cost [Piscopo 2013].

CTS is controlled by the enterprise providing services or by selling the product. However, customer behaviour is an important factor in implementing this concept. The greater is bargaining power of customers over suppliers, the higher is their demand, which in turn makes them more costly to serve [Piscopo 2013].

### 3. Activity Based Costing as a sub process in Cost-to-Serve concept

Activity Based Costing and Cost-to-Serve do not contradict. ABC may be an efficient sub process of Cost-to-Serve. The proper usage of ABC model lets it remain complementary to CTS. Cost-to-Serve is far more complex making it time-consuming and precision requiring. The slightest mistake at the beginning of the Cost-to-Serve implementation process extrapolates on its every further stage.

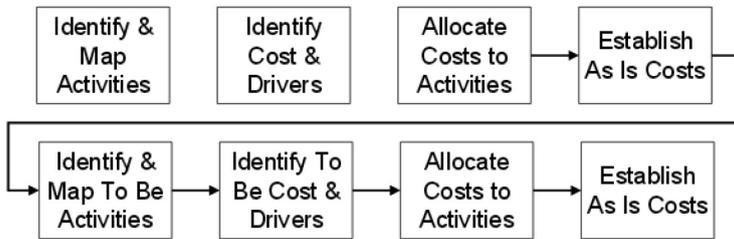


Figure 1. Traditional ABC Approach

Source: [O’Byrne 2008, p. 11].

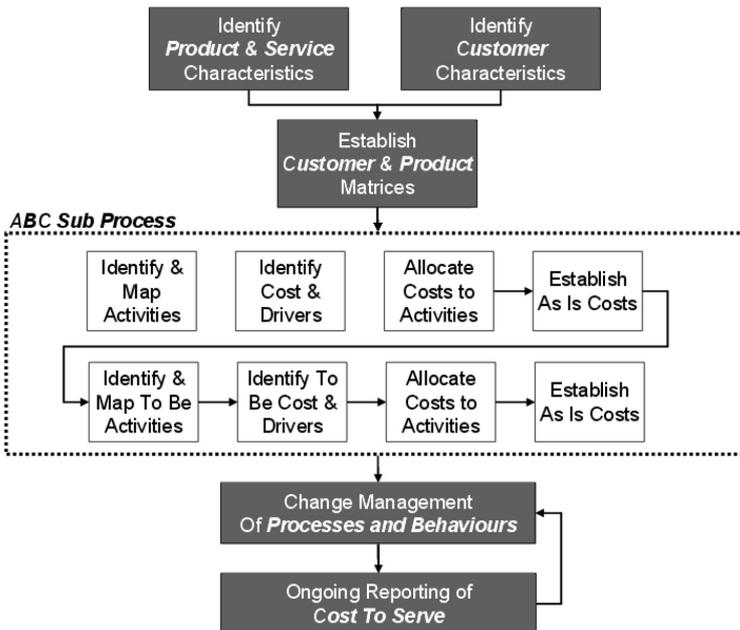


Figure 2. Cost-to-Serve approach with Activity Based Costing sub process

Source: [O’Byrne 2008, p. 12].

Figures 1 and 2 present the ABC model and CTS model in which Activity Based Costing is used as a sub process.

It is worth noticing that traditional ABC approach takes no account of the customer and product characteristics that can create additional costs into the supply chain. However, implemented as a sub process to Cost-to-Serve it can complement in such aspects as inner activity-driven cost allocation where CTS identifies customer and product characteristics allocating costs to specific and individual customer optimising the profitability of the enterprise.

#### **4. Customer profitability analysis (CPA)**

Nowadays, enterprises move from being product-centred to being customer-centred. Due to this attitude customer relationship management initiatives are at the forefront of company's efforts. That aspect of customer profitability is important in the whole process.

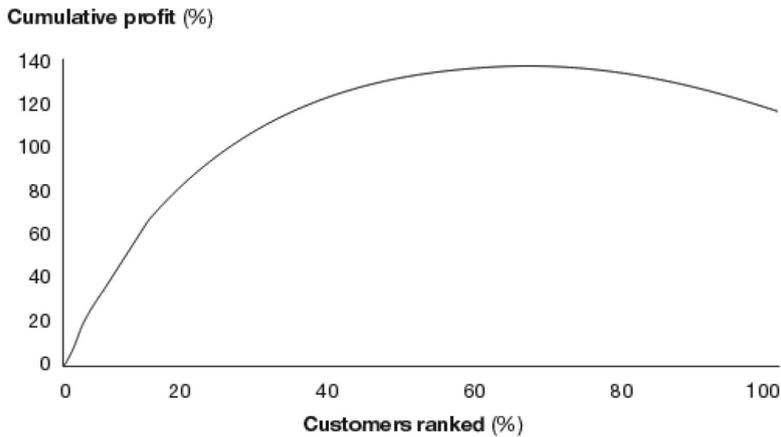
Empirical studies of Cost-to-Serve show that this method is highly associated with the analysis of customer profitability. Customer profitability may be described as a manufacturing contribution of the products sold while decreasing costs to serve the customer. There are three objectives in this analysis [Guilding, McManus 2002]:

- appraising the incidence of CPA,
- assessing preparations of practitioners of CPA's merit as a managerial tool,
- developing and testing hypotheses connected to contingent factors that affect using and perceiving merit of CPA.

According to Pfeifer, Haskins and Conroy [2005, p. 7] "Customer Profitability (CP) is the difference between the revenues earned from and the costs associated with the customer relationship during a specified period." In other words it is the analysis of the revenue streams and service costs associated with specific customers or customer groups. The main problem here is that many costs are not related to products but to how they are served to customers.

The purpose of CPA is to provide guidance for actions to be taken in the implementation of Customer Relationship Management. It determines the profit margin generated by each and every customer. There are many statements claiming that a small group of customers generate a high proportion of the total profit, while the rest contribute insignificant or even none profit at all. The tendency is illustrated in Figure 3.

There are three types of potentially non-profitable customers. New and growing customers who are supposed to be profitable in the future make the first group. Another group is made by customers who provide benefits other than financial. The character of such benefits may be informational or learning. The last type of non-profitable customers are those who are considered to be the leaders in the market or area of their economic activity [Kaplan 1992, p. 60].



**Figure 3.** Customer profitability analysis

Source: [Scarlett 2003].

The fact that a customer is not profitable does not mean his removal or forcing him to accept different terms. This approach would reduce the customer's level of satisfaction and should not occur. Using tools like Cost-to-Serve gives opportunities to control and distribute the burden of costs which allows for optimising the profitability of each customer.

As stated previously, traditional cost-determination systems are not suitable for an accurate analysis of the performance of the individual customer. Cost-to-Serve methodology solves this problem. It divides costs in some significant groups. As far as CPA analysis is concerned costs may be presented in following hierarchical way, which is presented in Figure 4.

Revenues
– Customer-specific costs
Customer-specific contribution
– Customer-line costs
Customer-line contribution
– Company enterprise cost
Operating Profit

**Figure 4.** Costs hierarchy in CPA analysis

Source: [Foster et al. 1996, p. 12].

This hierarchy forces the user to decide how many levels of costs to include in CP for the particular purposes at hand.

It is easily noticeable that customer profitability analysis is connected to the Activity Based Costing approach. However, due to this fact it also has critics. Pertaining to the application of ABC in CPA, Johnson suggested that concepts based on activities are overrated and companies should focus on customer's total satisfaction [Johnson 1992]. If the customer needs frequent deliveries in small parcels and the supplier is able to face these needs, the activity analysis may confuse the supplier. Nevertheless, opinions similar to Johnson's are not common and activity-based methods still meet high popularity and interest.

## 5. Customer profitability analysis applying Cost-to-Serve approach

Cost-to-Serve is a very efficient tool which has been proven in many empirical studies. A significant research covering the Cost-to-Serve methodology was conducted in Brazilian food industry. The whole process lasted over six months while key persons for the researched company were interviewed and complex documentary was analysed.

Tables 1 and 2 present the results covering margins with and without Cost-to-Serve approach in CPA. The purpose of the example quoted here is not to repeat the analysis conducted before but only to present how the mechanics of Cost-to-Serve affect costs on true numbers in practice.

**Table 1.** Net sales and manufacturing contribution per channel (in Brazilian reais)

Category	Wholesalers	Large shops	Super-markets	Medium retail	Total
Net sales	401 911	3 553 279	339 978	762 257	5 057 425
Chocolates	10 693	88 355	6 597	16 351	121 996
Yogurts	143 168	1 432 018	211 029	411 178	2 197 393
Milk	213 712	1 881 889	86 047	261 643	2 443 291
Desserts	34 336	151 018	36 306	73 085	294 745
Manufacturing contribution	177 871	1 621 624	144 197	306 597	2 250 289
Chocolates	5 057	42 169	3 171	7 158	57 555
Yogurts	67 648	718 729	89 183	166 161	1 041 721
Milk	89 704	776 547	34 891	101 161	1 002 303
Desserts	15 462	84 177	16 953	32 118	148 710

Source: [Guerrero et al. 2008, p. 399].

Cost-to-Serve approach is more complex and gives a more accurate image of cost distribution in the company, which results from Table 3. However, the research

lasting over half a year is demanding and complicated. Nevertheless, implementing Cost-to-Serve optimises margins in every aspect it is applied.

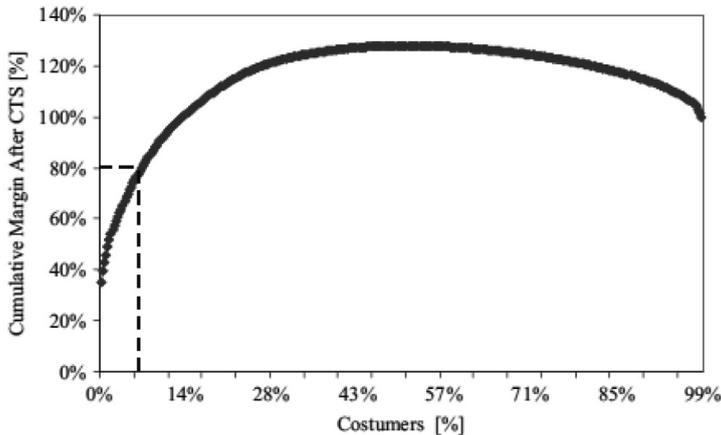
**Table 2.** Margin after Cost-to-Serve in composition (in Brazilian reais)

Category	Wholesalers	Large shops	Supermarkets	Medium retail	Total
Manufacturing contribution	177 871	1 621 624	144 197	306 597	2 250 289
Chocolates	5 057	42 169	3 171	7 158	57 555
Yogurts	67 648	718 729	89 183	166 161	1 041 721
Milk	89 704	776 547	34 891	101 161	1 002 303
Desserts	15 462	84 177	16 953	32 118	148 710
Cost-to-Serve (CTS)	34 197	1 378 066	135 342	295 146	1 842 751
Chocolates	764	27 198	2 721	5 921	36 604
Yogurts	12 521	645 003	89 085	167 493	914 102
Milk	18 195	642 328	30 195	92 821	783 539
Desserts	2 717	63 536	13 341	28 911	108 505
Margin after CTS	143 674	243 559	8 855	11 451	407 539
Chocolates	4 294	14 971	450	1 237	20 952
Yogurts	55 127	73 726	98	1 333	130 284
Milk	71 509	134 219	4 695	8 339	218 762
Desserts	12 744	20 642	3 612	3 208	40 206

Source: [Guerrerio et al. 2008, p. 402].

Analysing only net sales, it is clearly seen that large shops generate about 70.2% of the whole net sales. There are evidences to assume that this customer is highly profitable for the enterprise. However, after Cost-to-Serve analysis showed that large shops channel provided only 59.7% of the total margin. On the other hand, the wholesalers channel providing only 7.9% of the whole net sales generates 35.2% of the total margin after Cost-to-Serve which makes it not only highly profitable but the most profitable of all customers. Supermarkets and medium retailers did not provide high values in net sales and CTS analysis proved a low contribution margin.

Customer profitability analysis based on Cost-to-Serve methodology revealed that 80% of margin came from 6% of customers. Figure 5 shows that CPA behaves similarly to the alleged *whale curve* model.



**Figure 5.** Customer profitability curve for the empirical example

Source: [Guerrero et al. 2008, p. 403].

## 6. Conclusions

The empirical example proved that CTS method of calculation provides more complex information for customer management than traditional approach. Unfortunately, Cost-to-Serve being a specific approach does not allow for extrapolating results on other enterprises. The implementation of Cost-to-Serve in some companies may give different results or effects delayed in time. However, this aspect is even more tempting to analyse various enterprises and to verify if the CTS is an efficient tool to optimise customer profitability.

Cost-to-Serve is a methodology that still requires further investigation. Despite the fact that it is not widely described and sometimes only fragments of information can be found, CTS concept is worth being analysed.

Contemporary market forces entrepreneurs to improve continuously and this also covers costing methods. Cost-to-Serve is a perfect area to improve enterprise's effects, which meets the market requirements. CTS is a complex customer-driven concept that focuses on a single customer. Nowadays, it is associated primarily with supply chain management but it can be implemented in companies, where costs are gone beyond strictly logistics' character. Nonetheless, this phenomenon requires further researches and deeper analysis.

Of course, Activity Based Costing should not be rejected. It is a tested method which in sufficiently high level analyses provides efficiency of processes occurring in the enterprise. Moreover, this article also presents how ABC may be used to carry out the Cost-to-Serve implementation as a large sub process. Costing methods should be continuously improved and the synergy of both ABC and CTS may crop

up outstanding effects. This is due to the broad look Cost-to-Serve offers with a core from ABC, which is a great method itself.

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## WPLYW METODY COST-TO-SERVE NA ZYSKOWNOŚĆ KLIENTA

**Streszczenie:** W artykule podjęto tematykę z obszaru nowoczesnych metod rachunku kosztów. Szczególną uwagę poświęcono metodologii Cost-to-Serve. W pierwszej części artykułu autorzy prezentują ogólną koncepcję metodologii i określają jej główne obszary. W drugiej części ukazano, jak rachunek kosztów działań (ABC) – bardziej tradycyjne podejście niż Cost-to-Serve – może być użyty jako subproces przy przeprowadzaniu analizy Cost-to-Serve. Trzecia część artykułu skupia się na analizie zyskowności klienta przy wykorzystaniu metodologii Cost-to-Serve. Artykuł zawiera także przykład empiryczny zastosowania Cost-to-Serve w rzeczywistości gospodarczej. Wykorzystano w tym celu wyniki badań przeprowadzonych w Brazylii w tamtejszym przemyśle spożywczym. Artykuł kończą wnioski na temat koncepcji Cost-to-Serve i dalszych perspektyw jej rozwoju.

**Słowa kluczowe:** Cost-to-Serve, zyskowność klienta, rachunek kosztów skierowany na klienta.