Activity-Based Costing Application in an Urban Mass Transport Company

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Abstract

The purpose of this paper is to provide a basic overview of the application of Activity-Based Costing in an urban mass transport company which operates land public transport via buses and trolleys within the city. The case study was conducted using the Activity-Based Methodology in order to calculate the true cost of individual operations and to measure the profitability of particular transport lines. The case study analysis showed the possible effects of the application of the Activity-Based Costing for an urban mass transport company as well as the limitations of using the ABC methodology in the service industry.

With regards to the application of the ABC methodology, the primary limitation of the accuracy of the conclusions is the quality of the non-financial information which had to be gathered throughout the implementation process. A basic limitation of the accurate data acquisition is the nature of the fare system of the transport company which does not allow the identification of the route that is taken by an individual passenger. The study illustrates the technique of ABC in urban mass transport and provides a real company example of information outputs of the ABC system. The users indicated that, the ABC model is very useful for profitability reporting and profit management. Also, the paper shows specific application of the Activity-Based Methodology in conditions of urban mass transport companies with regional specifics.

Key words: Activity-Based Costing, Urban mass transport, ABC implementation, overhead, cost allocation.

1. INTRODUCTION

Urban mass transport could be considered as the very specific area for application of sophisticated costing methods based on true cost allocation of existing cost objects. One of the important issues that limit the application of modern costing system is the fact that urban mass transport companies usually do not operate in fully competitive environment. Most companies, which operate the urban mass transport, are fully owned by municipalities and are not considered as the subjects earning any profit for their owner.

Companies operating the urban mass transit usually provide their services in a highly regulated environment. De Borger et al. (2002) point at that government intervention in the sector is widespread and has traditionally been justified by reference to a series of market failures. In the past two decades, however, concerns about possible regulatory failures have led to a reassessment of the role of the state in the organization in the sector.

One of the primary targets of every service provider is to achieve the efficiency of the existing operations. Elementary efficiency in the operations could be generally measured by the quantity of the output and the inputs consumed, which could be quantified as the company costs (Drury, 2001; Král, 2006), in other words, when production proceeds at the lowest possible per-unit cost. Lowell (1993) distinguishes between efficient and inefficient production and estimates the degree of inefficiency by considering observed best practice standards in the industry as a benchmark.

Efficiency and costs measurement in the conditions of urban mass transport companies are, despite these simple relations, restricted for several reasons. Firstly, the companies which operate the urban mass transport usually work with a very complicated structure of customers, lines, services and other cost objects. Secondly, the fare technology usually does not allow obtaining the information about the passenger behavior, which means that the company is unable to get the information about the specific route taken by individual passenger. And thirdly, the above described government and municipality intervention in a non-competitive area usually causes the inability of management of urban mass transport companies to apply any progressive programs to reduce the costs or increase the effectiveness of existing operations.

Despite the fact that efficiency could be accepted as the primary objective of business, stakeholder's structure in the mass transport companies usually disallows the use of efficiency as the primary objective of the mass transport management (Susniene and Jurkauskas, 2008).

2. LITERATURE REVIEW

2.1 Emergence of the Activity-Based Costing approach and its applications

The Activity-Based Costing method was developed in the mid 1980´s as a powerful tool for the cost measurement of specific cost objects based on the process and activity measurement (Kaplan, 1987).

The ABC concept was designed as a method which eliminates the shortages of the traditionally used absorption costing methods. Traditional costing techniques were used for the purposes of overhead cost allocation during the 20th century. These are mostly based on simplified procedures using principles of averages, which could dramatically distort the cost allocated to the defined cost objects.

The Activity-Based Costing could bring about significant improvement in the quality of overhead cost allocation. The ABC process is able to incorporate both physical measures and causal principles in the costing system. The basic idea of ABC is to allocate costs to operations through the various activities in place that can be measured by cost drivers. In other words, cost units are assigned to individual activities, e.g., planning, packing, and quality control using a resource cost driver at an initial stage with the costs of these activities being allocated to specific products or cost objects in a second phase of allocation via an activity cost driver (Kaplan and Cooper, 1998).

Nevertheless, it should be noted that the ABC approach is not a truly revolutionary or a completely new means of allocation. In essence, it has transformed the logical relationships between costs and company outputs entering a costing system. Indeed, the ABC has incorporated logical allocation procedures from costing systems predating its own complex methodology (Popesko, 2010).

Early applications in the industry sector (Innes and Mitchell, 1990; Glad and Becker, 1996) have been followed by many applications in the service (Tsai and Kuo, 2004), logistics (Baykasoglu and Kaplanoglu, 2008, Everaert et al., 2008), healthcare (Udpa, 1996) and other specific areas. But the direct application of ABC to urban mass transport companies is not a frequent case in the literature.

Although using ABC brings many advantages from the viewpoint of management, the implementation of ABC to a service organization, especially to urban mass transport, poses several challenges which do not generally exist for ABC applications in manufacturing. There are several reasons for this challenge of the ABC implementation which was defined by Rotch (1990) for a logistic company, but which could be accepted also for application in urban mass transportation:

- Output is harder to define
- In many cases determining activities and cost drivers is not straightforward
- Data collection and measurements is more complicated than manufacturing
- Activity in response to service requests may be less predictable

Joint capacity represents a high portion of total cost and is difficult to link output related activities.

2.2 Activity-Based Costing methodology

The Activity-Based Costing methodology has been described and further developed by many authors (Drury, 2001; Glad and Becker, 1996; Kaplan and Cooper, 1998; Staněk, 2003). The ABC process could vary from simple ABC, using only one level of activities to expanded ABC, comprising various levels of activities and allowing mutual allocation of activity costs (Cookins, 2001).

Together with the emergence of ABC methodology, issues relating to its practical utilization and implementation have been presented by both academics and practitioners. Drury (2001) defined the necessary steps to set up an ABC system as follows:

1. Identifying the major activities taking place in an organization
2. Assigning costs to cost pools/cost centers for each activity
3. Determining the cost driver for every activity
4. Assigning the costs of activities to products according to their individual demands on activities

These are described by other authors in a very similar manner. For example, Staněk (2003) considers adjusting accounting input data as the initial procedure in building the system. Furthermore, he prescribes the fourth step of implementation as calculating the activity rate, which is defined as an activity unit cost.

The above-defined steps of system design could be considered as a very brief overview for successful implementation process. Some other authors define much more detailed application procedures. The steps in the ABC application methodology defined by Glad and Becker (1996) are:

1. To determine the nature of costs and analyze them as direct traceable costs, activity traceable costs and non-traceable costs (or unallocated costs)
2. To account for all traceable costs per activity, distinguishing between primary and secondary activities
3. To identify the company's processes, activities and tasks, and create process flowcharts

4. To determine cost drivers for each activity and use output measures to calculate activity recovery rates
5. To trace all secondary activities to primary activities, so that the combined activity rates include all support costs
6. To identify which cost objects are to be priced. Compile the bill of activities for each cost object
7. To multiply the activity recovery rates by the quantity of output consumed as specified in the bill of activities. The sum of these calculated costs will give the activity-traced cost of the cost object
8. Direct costs and non-traceable costs should be added to the cost calculated above to give the total cost of the cost object

Many applications of the ABC in the service area point out that a simple ABC method could be in some cases insufficient to fulfill the demands on data processing. Everaert et al. (2008) introduce the fact that since the ABC uses a single driver rate for each activity, it is difficult to model multi-driver activities, which could be very essential for service applications of ABC. For example, order processing costs not only depend upon the number of orders processed, but also on the type of communication medium used by the customer (online versus a written document). Working with an average cost per order of € 50 thereby provides inaccurate cost information. One could suggest splitting the activity into two activities, such as "order processing of online order" and "order processing based upon a written document." However, splitting inflates the number of activities in ABC and creates difficulties in estimating the practical capacity for each sub-activity.

In order to overcome the difficulties of ABC, Kaplan and Anderson (2004, 2007) developed a new approach to ABC, called time-driven ABC. This new approach does not assign resources and costs to the specific activities. The TDABC approach identifies the different departments, their costs and their practical capacity. The breakthrough of TDABC lies in the time estimation. The time of performing an activity is estimated for each specific case of the activity, based upon the different characteristics of that specific case. These characteristics are called "time-drivers," because they "drive" the time spent on a given activity. Time equations model how time drivers drive the time spent on activity. In complex environments wherein the time needed to perform an activity is driven by many drivers, TDABC can include multiple drivers for each activity (Everaert et al., 2008).

3. RESEARCH METHOD CONDUCTED

As the title of the paper explains, the primary method used for achieving the goals is the case study research. The purpose of this study is to illustrate how the ABC can be used for modeling costs and determining customer profitability in an urban mass transport company. This purpose calls for a case study methodology, where the case is used as an illustration of an emerging theory (Keating, 1995). The methodology combined qualitative interview data with a quantitative data analysis, which benefits the reliability of the conclusions.

4. RESULTS OF THE CASE STUDY

The company operating the land urban mass transport by means of busses and trolleybuses within the territory of Zlín (population 100 000) was chosen for carrying out this case study. The reason why this company was chosen is the fact that the company started dealing with more accurate cost allocation based on the ABC techniques.

The company operates 13 trolleybus lines, 11 bus lines, and cooperates with the national provider of the passenger rail transport. Besides the major transport services, the company also provides other additional services: an advertising agency and repair services for trolleybuses. The company owns 65 trolleybuses and 45 busses.

The following table presents the basic information about the company performance in years 2006 – 2008. The financial data are transformed from CZK currency in fixed exchange rate of 25 CZK per EURO. Income from the transportation service is calculated as the sum of all types of fare including the time coupons. The number of passengers was calculated as the sum of individual fares sold and estimated volume of 4 rides a day per time coupons.

Tab. 1 – Characteristics of Zlín urban transport company. Source: Company financial statements

	2006	2007	2008
Total income	€ 9 912 681	€ 10 067 454	€ 10 129 249
Income from transportation services	€ 5 005 293	€ 4 821 865	€ 4 633 981
Municipal subsidies	€ 3 544 520	€ 3 546 520	€ 3 723 200
Costs	€ 10 198 009	€ 10 462 492	€ 10 683 275
Profit	-€ 285 328	-€ 395 038	-€ 554 026
Number of passengers	38 795 880	37 709 730	37 334 050

As the table shows, the trend in number of passengers and income from transportation services is declining. This confirms the De Boer´s (2008) proposition about the declining trends in transport demand in most industrial economies. Hajek and Siwek (2009) also researched the passenger behavior in the Zlín region and conclude the growing passenger preference for individual means of transport. Table 1 also illustrates quite a large portion of municipal subsidies for the company. The net income from the fare covers only 45% of the cost of transportation services. This portion is quite standard in conditions of the Czech Republic. The companies operating the urban mass transport in similar cities are able to cover only part of the costs from the fare. Values differ from 46% in Ústí nad Labem to 29% in České Budějovice (SDPCR, 2007). This situation matches the situation in developed economies. Pucher et al. (1983) features that the passengers fare covered only 42% of transit operating costs in the U.S. in the 1980´s compared to 99% in 1965 and 86% in 1970.

Drury´s elementary methodology has been used for the ABC method application, with additional consulting of other sources (Glad and Becker, 1996), (Popesko, 2010).

The first step of ABC implementation was to define the appropriate structure of activities. Four major processes were defined within the organization: mass transport services, advertising services, external and supplemental services and the support process. All processes were than disarticulated into several activities. Table 2 and Figure 1 display the activities defined within the model. The numerical codes were also assigned to individual activities in order to facilitate the work with activities. The objective of the implementation was to keep the lowest possible number of activities in order to simplify the work with the data. The final structure contains 11 primary and 4 secondary activities. The defined structure of the ABC model is very simple. Some of the activities (201, 301, 302) were defined in the way that matches the future cost object for the purpose to simplify the allocation of the activity costs to cost objects.

Tab. 2 – Processes and activities defined within the model. Source: authors

Process: 100 - Mass transport operation	
101	Administration and support of the mass transit
	The activity contains all administrative and support tasks such as dispatching, technical control, transport schedules, etc.
102	Tickets sale and distribution
	The activity gathers all tasks and actions performed within the sales and distribution process of fare tickets and subscriptions.
103	Daily service and cleaning of vehicles
	Daily cleaning, maintenance and repair of vehicles
104	Operation of vehicles
	The operation of vehicles and other similar related costs
105	Ticket inspection
	The activity contains actions and tasks performed by ticket inspectors and other administrative actions related to fines and fine claims
191	Traffic network maintenance
	Trolley lines and bus stops maintenance
192	Repair of vehicles
	All heavy repairs of vehicles which are not performed within activity 103
Process: 200 - Advertising and promotional services	
201	Advertising and promotional services
	Advertising and promotional services which are offered by the company to external customers, the most common actions are the posters inside and outside of vehicles
Process: 300 - External and supplemental services	
301	External repairs
	Heavy repairs of external customer´s vehicles
302	Charter services
	Supplying complex transport services to external customers based on special orders
303	Other external services
	Providing supplemental services to external customers, such as renting offices

Process 900 – Secondary activities	
901	Management and infrastructure
	General infrastructure of the company + management activities
902	Building maintenance
	Costs and activities related to the building maintenance
903	Accounting and finance
	Accounting and finance activities
904	IS/IT
	Information system and technologies

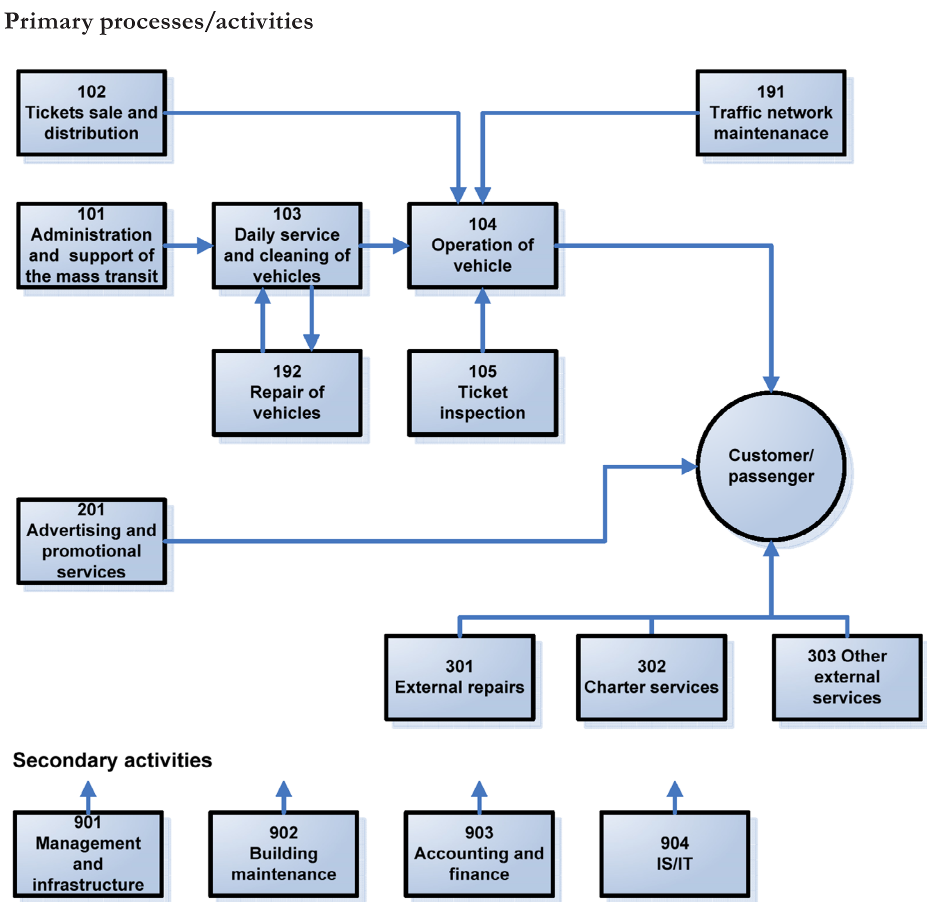

Fig. 1 – Structure of activities within the model. Source: authors

The second step within the ABC implementation process was to assign the costs to defined activities. The costs registered in the accounting books on individual cost centers were assigned to the activities using different ways. Every cost element was investigated and after the interview with persons in charge was assigned to the specific activity. The Activity cost matrix (Glad and Becker, 1996; Popesko, 2010) was put together for illustrating the relations between the individual cost types and defined activities.

According to the relatively simple structure of activities, the assignment of costs to those activities was in some cases relatively easy, because the whole cost centers could be assigned to the activities. Table 3 demonstrates the total sum of costs which were assigned to individual activities.

According to Drury (2001), the next step in traditional ABC application is determining the cost driver for every activity. Some studies (Popesko, 2008), however, showed the necessity of determining the cost objects before the setting of appropriate cost drivers in order to adjust the whole ABC cost model. Nevertheless, the definition of appropriate cost object could be the important difference between the ABC application in an urban mass transport company and the traditional application in a manufacturing industry. The primary question at this stage of implementation process was to specify the appropriate cost objects. Drury (2001) defines the cost object as the activity for which separate cost accumulation (or cost measurement) is desired. The primary intention of the implementation team was to define the elementary possible cost object, which is a single ride taken by individual passenger. However, according to mentioned problems related to the time-fare and the time coupons used by company, the use of such cost object appeared as impossible and also unneeded from the manager's perspective. After the discussions held inside the implementation team, the following cost objects were defined as the most useful for achieving the implementation goals: the individual bus and trolleybus lines were defined as the first cost object and the individual supplemental services such as external repairs, advertising services, etc., were determined as the second cost object. Supplemental services defined as the cost object are specified in the equivalent philosophy as any activities. This is partially a different structure than as defined in the original ABC philosophy, but the primary objective of the application was to achieve the managerial goals defined as the useful profitability measurement of defined cost objects.

Tab. 3 – List of activities and assigned primary activity costs. Source: authors

Process	**Activity**		**Total activity costs**
100	**Mass transport services**		€ 9 142 259
	101	Administration and support of the mass transit	€ 364 791
	102	Tickets sale and distribution	€ 267 147
	103	Daily service and cleaning of vehicles	€ 609 283
	104	Operation of vehicles	€ 5 890 391
	105	Ticket inspection	€ 254 900
	191	Traffic network maintenance	€ 434 445
	192	Repair of vehicles	€ 1 321 303

200	**Advertising services**		€ 128 665
	201	Advertising and promotional services	€ 128 665
300	**External and supplemental services**		€ 537 907
	301	External repairs	€ 326 251
	302	Charter services	€ 57 907
	303	Other external services	€ 153 750
900	**Support activities**		€ 874 444
	901	Management and infrastructure	€ 376 237
	902	Building maintenance	€ 298 300
	903	Accounting and finance	€ 147 495
	904	IS/IT	€ 52 412

According to the above mentioned facts, the definition of the cost drivers was very specific and in most cases the intensity drivers (direct allocation) were used for the allocation of activity costs to individual cost objects. Table 4 indicates the cost drivers used for the allocation of activity costs to cost objects. No specific relations and cost allocations were defined within the mass transport services (process 100). Even if the more accurate cost drivers could be identified, finally, the simple cost driver – the number of total kilometers of all vehicles was selected as the general cost driver for most of the activities. This allowed the relative simplicity of the ABC model. Only activities where the different cost drivers were defined are traffic network maintenance, which is performed only in connection with trolleybus transport, and the ticket inspection, which was measured individually. For the traffic network maintenance, the total number of trolleybus kilometers was chosen as the cost driver. After the definition of the cost drivers the output measure of the individual activities had to be determined. Output measure quantifies the number of cost drivers consumed in specific time period. After the determination of output measures, the primary rates of the activities could be calculated as the total activity costs divided by determined output measures.

Tab. 4 – List of activity cost drivers, output measures and primary rates of activities. Source: authors

Process	Activitiy		Total activity costs	Cost driver	Output measure	Primary rate
100	**Mass transport services**		**€ 9 142 259**			
	101	Administration and support of the MT	€ 364 791	number of total km of all vehicles	4912587	€ 0,074
	102	Tickets sale and distribution	€ 267 147	number of total km of all vehicles	4912587	€ 0,054
	103	Daily service and cleaning of vehicles	€ 609 283	number of total km of all vehicles	4912587	€ 0,124

	104	Operation of vehicles	€ 5 890 391	number of total km of all vehicles	4912587	€ 1,199
	105	Ticket inspection	€ 254 900	direct alloacation	N/A	
	191	Traffic network main-tananace	€ 434 445	number of total km of trolley-buses	3182620	€ 0,137
	192	Repair of vehicles	€ 1 321 303	number of total km of all vehicles	4912587	€ 0,269
200	**Advertising services**		**€ 128 665**			
	201	Advertising and promo-tional services	€ 128 665	direct allocation	N/A	
300	**External and supplemen-tal services**		**€ 537 907**			
	301	External repairs	€ 326 251	number of hours	20708	€ 15,755
	302	Charter services	€ 57 907	number of km	28056	€ 2,064
	303	Other external services	€ 153 750	direct alloacation	N/A	
900	**Support activities**		**€ 874 444**			
	901	Management and infra-structure	€ 376 237	primary activity costs	245220779	€ 0,002
	902	Building maintenance	€ 298 300	square meters	19810,98	€ 15,057
	903	Accounting and finance	€ 147 495	account enries	7422	€ 19,873
	904	IS/IT	€ 52 412	number of com-puters	70,00	€ 748,748

The following step of the ABC system implementation was to allocate the costs of secondary activities to defined primary activities. This step is a usual part of all ABC systems, while the secondary activities cannot be directly traced to the cost objects. They can only be assigned to the primary activities, which consume their outputs (Glad and Becker, 1996). Defined cost drivers were used for the allocation of those secondary activity costs. Table 5 shows the recalculated primary activity costs after the allocation of secondary activities. The combined rate is calculated as the sum of primary rates and secondary rates. The secondary rate represents the consumption of secondary activity costs by unit of primary activity.

The standard methodology described in detail by Popesko (2009) was used for the allocation of secondary activities. This methodology is based on quantification of volume, in which primary activities consume the outputs of secondary activities. Numbers of outputs (output measures) of secondary activities which were consumed by individual primary activities are then multiplied by the primary rates of those secondary activities.

Tab. 5 – Total activity costs after allocation of secondary activity costs. Source: authors

Process	Activitiy		Total activity costs	Output measure	Second-ary rate
100	**Mass transport services**		**€ 9 826 812**		
	101	Administration and support of the MT	€ 408 357	4912587	€ 0,083
	102	Tickets sale and distribution	€ 301 440	4912587	€ 0,061
	103	Daily service and cleaning of vehicles	€ 686 411	4912587	€ 0,140
	104	Operation of vehicles	€ 6 149 859	4912587	€ 1,252
	105	Ticket inspection	€ 268 004	N/A	
	191	Traffic network maintananace	€ 490 847	3182620	€ 0,154
	192	Repair of vehicles	€ 1 521 894	4912587	€ 0,310
200	**Advertising services**		**€ 141 014**		
	201	Advertising and promotional services	€ 141 014	N/A	
300	**External and supplemental services**		**€ 621 551**		
	301	External repairs	€ 372 751	20708	€ 18,000
	302	Charter services	€ 70 441	28056	€ 2,511
	303	Other external services	€ 178 360	N/A	

4.1 Use of the model

After the finalization of all above mentioned steps the final outputs of model could be defined. The first output of the model was the cost calculations of the individual cost objects, in this case the mileage costs per kilometer travelled by vehicle. These costs could be easily quantified as the sum of combined rates of activities, which are used for the performance of urban mass transport. This means activities 101, 102, 103, 104 and 192 for buses and activities 101, 102, 103, 104, 191 and 192 for trolley busses. The sum of costs per km is then € 1.84 for busses and € 2.00 for trolley busses. In comparison, the km cost for charter services is € 2.51.

As far as the costs of operation of vehicles, also other cost objects were calculated. For repair services the calculated costs of € 18 was used. Other costs objects, as advertising services or other external services, however, were not calculated and analyzed in greater detail.

The calculation of the operation costs of vehicles per kilometer was not sufficient for considering the individual costs objects, defined as individual lines. For those purposes the costs and revenues of individual bus and trolleybus lines had to be estimated. The costs of the lines could be quantified based on the kilometer length of the line and the operation frequency. The revenue estimation was much more complicated because the used system of fare disallows the identification of individual passenger and route which he takes. One of the existing information inputs of the project was the observation research of passenger quantities in individual lines, which was conducted in 2008. In this research, the number of passengers in individual lines was determined. The research output was then used for allocation of revenues for individual lines.

Tab. 6 - Bus and trolleybus lines profitability. Source: authors

	line	# of passengers	% passengers	recalculated revenues (thous. CZK)	% km	Line cost (thous. CZK)	Profit (thous. CZK)	Protitability	Revenues /costs
trolleybus	1	753	0,8%	1 706	1,0%	2 594	-888	-52,0%	65,8%
trolleybus	2	16 594	17,2%	37 602	15,4%	38 883	-1 282	-3,4%	96,7%
trolleybus	3	2 507	2,6%	5 681	2,2%	5 582	99	1,7%	101,8%
trolleybus	4	5 749	6,0%	13 027	5,3%	13 275	-248	-1,9%	98,1%
trolleybus	6	15 324	15,9%	34 724	13,5%	33 985	739	2,1%	102,2%
trolleybus	8	9 555	9,9%	21 651	7,8%	19 546	2 106	9,7%	110,8%
trolleybus	9	7 461	7,7%	16 906	6,3%	15 933	973	5,8%	106,1%
trolleybus	10	4 399	4,6%	9 968	5,3%	13 432	-3 464	-34,8%	74,2%
trolleybus	11	3 960	4,1%	8 973	4,6%	11 583	-2 609	-29,1%	77,5%
trolleybus	12	1 166	1,2%	2 642	1,6%	3 911	-1 269	-48,0%	67,6%
trolleybus	13	2 688	2,8%	6 091	2,1%	5 170	921	15,1%	117,8%
trolleybus	14	1 413	1,5%	3 202	1,5%	3 829	-627	-19,6%	83,6%
bus	31	3 298	3,4%	7 473	4,5%	10 451	-2 977	-39,8%	71,5%
bus	32	2 482	2,6%	5 624	4,0%	9 439	-3 815	-67,8%	59,6%
bus	33	4 900	5,1%	11 103	5,9%	13 698	-2 595	-23,4%	81,1%
bus	34	1 514	1,6%	3 431	1,6%	3 812	-381	-11,1%	90,0%
bus	35	862	0,9%	1 953	1,3%	3 000	-1 046	-53,6%	65,1%
bus	36	1 437	1,5%	3 256	2,9%	6 710	-3 454	-106,1%	48,5%
bus	51	227	0,2%	514	0,7%	1 613	-1 098	-213,5%	31,9%
bus	53	330	0,3%	748	0,5%	1 245	-498	-66,5%	60,0%
bus	55	7 312	7,6%	16 569	7,7%	17 994	-1 425	-8,6%	92,1%
bus	58	751	0,8%	1 702	0,8%	1 857	-156	-9,2%	91,6%
bus	70	1 705	1,8%	3 863	3,5%	8 129	-4 266	-110,4%	47,5%
total		**96 387**	100,0%	**218 411**	100,0%	**245 670**			

Table 6 illustrates the calculation of profit and profitability of individual bus and trolleybus lines. Column "revenues/costs" shows the percentage of the cost covered by the revenues. As we can see, only 5 lines out of 23 are able to cover its costs by the revenues. Municipal subsidies are included in the line revenues.

After the calculation of individual lines profitability, the general profitability of major cost objects was calculated. Those cost objects are in some cases equal to defined activities. Table 7 shows the profitability of individual segments of company. As we can see the most profitable activity/cost objects are advertising and promotional services and external repairs.

Tab. 7 – Profitability of cost objects. Source: authors

	Total costs	**Total Revenues**	**Profit**
Mass transport services	€ 9 826 812	€ 8 736 441	-€ 1 090 371
Ticket inspection	€ 268 004	€ 246 755	-€ 21 248
Advertising and promo services	€ 141 014	€ 550 920	€ 409 906
External repairs	€ 372 751	€ 525 539	€ 152 788
Charter services	€ 70 441	€ 53 537	-€ 16 904
Other external services	€ 178 360	€ 174 919	-€ 3 441

5. DISCUSSION

The application of the Activity-Based approach to the urban mass transport company is hugely diverse from the traditional application in manufacturing industry. The major difference consists in the structure of the cost objects, which is usually multidimensional. Despite the many problems that go with the application process, the ABC model is able to offer different view on the cost of activities and products inside the company. The ABC model, which was constructed within this case study, is relatively simple and does not apply to all ABC features, but could be accepted as the model example of further research in the field.

Application of the ABC in urban mass transport operator brought a lot of specifics. One of the most important specific of the study is that the company doesn´t operates in the pure competitive environment. According to the municipal subsidies, the company couldn't be managed as the organization which is oriented to the profit creation. Company receives the municipal subsidies in order to operate the specific routes. Profit generated by the individual operated routes, which have been calculated in the study, then could not be used for the elimination of the unprofitable routes. ABC in this situation could show the way how to reduce the loss generated by the less profitable routes or determine the impact of the different routes structure.

Study also showed the level of profitability of individual processes of the company. This information is not new, because the existing cost center structure of the company, used before the ABC application allows the profit measurement. On the other hand ABC brings more accurate way of support activity costs allocation.

6. CONCLUSION

The many authors see the application of Activity-based costing method in service organization as the more usable, than in manufacturing industry. As mentioned above, the service organizations along with the urban mass transport providers face the many problems via application of effective costing system. Every additional piece of information which is provided by costing system could improve the quality of decision making and may lead into increase of performance and profitability of such organization.

First step via more accurate profit measurement is separating of the costs and revenues of individual services which are provided. In our case the advertising, charter and other supplemental services had to be separated from the main transport services. Detailed analysis of the provided services and operated lines could be the first step of more cost-effective decision making.

References

1. Baykasoglu, A., & Kaplanoglu, V. (2007). A service-costing framework for logistics companies and a case study. *Management Research News*, Vol. 30, No. 9, 621-633.
2. De Borger, B., Kerstens, K., & Costa, A. (2002). Public transit performance: what does one learn from frontier studies? *Transport reviews,* Vol. 22, No. 1, 1-38.
3. Drury, C. (2001). *Management and Cost Accounting* (5th Ed.). London: Thomson Learning
4. Everaert, P., Bruggeman, W., Sarens, G., Anderson, S., & Levant, Y. (2008). Cost modeling in logistics using time-driven ABC Experiences from a wholesaler. *International Journal of Physical Distribution & Logistics Management,* Vol. 38 No. 3, 172-191.
5. Glad, E., & Becker, H. (1996). *Activity-Based Costing and Management.* New York: John Wiley and Sons.
6. Hajek, O., & Siwek, T. (2009). The perception of public city transport in Zlín (Czech Republic) as an alternative to individual transport by its potential users according to the level of their income. *Moravian Geographical Reports*, Vol.17, No. 1, 30-39.
7. Innes, M., & Mitchell, F. (1990). *Activity Based Costing: A review with case studies.* London: The chartered institute of management accountants.
8. Kaplan, R., & Johnson H. (1987). *Relevance lost: Rise and fall of management accounting.* Boston: Harvard Business School Press.
9. Keating, P. (2005). A framework for classifying and evaluating the theoretical contributions of case research in management accounting. *Journal of Management Accounting Research*, Vol. 7, No. 2, 66-86.
10. Král, B. (2006). *Manažerské účetnictví.* Praha: Management Press.
11. Popesko, B. (2008). Activity-based costing applications in the plastics industry – Case study. *Issues in Global Research in Business and Economic – Proceedings of the International Conference of Global Academy of the Business and Economic Research,* Orlando, USA, FIZJA International 2008, 32–45.
12. Popesko, B. (2009). How to manage the costs of service departments using Activity-Based Costing. *International Review of Business Research Papers*, vol. 5, no. 4, 91 -101.

13. Popesko, B. (2010). Activity-Based Costing application methodology for manufacturing industries, *E+M Ekonomie a management*, vol. 1/2010, 103-114.
14. Pucher, J., Markstedt, A., & Hirschman I. (1983). Impacts of Subsidies on the Costs of Urban Public Transport. *Journal of Transport Economics and Policy*, Vol. 17, No. 2, 155-176.
15. SDPCR – Sdružení dopravních podniků ČR. (2008). *Annual report 2008*. Retrieved from http://www.sdp-cr.cz/archiv/vz2008.pdf
16. Susniene, D., & Jurkauskas, A. (2008). Stakeholder approach in the management of public transport companies. *Transport*, Vol. 23, No. 3, 214-220.
17. Tsai, W., & Kuo, L. (2004). Operating costs and capacity in the airline industry. *Journal of air transport management*, Vol. 10, No. 4, 269-275.
18. Udpa, S. (1993). Activity-Based Costing for Hospitals. *Health care management review*, Vol. 21, No. 3, 83-96.

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