

Proposal of Benchmarking Methodology for the Area of Public Passenger Transport

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Abstract

This paper introduces the concept of benchmarking - the systematic approach that provides to performance assessment and identification of best practice - as a powerful tool for the development of performance, quality, sustainability and economic efficiency of transport services. It summarizes the results and findings of a study conducted to benchmark the performances of selected Slovak urban public transport enterprises. The study was effectuated in close cooperation with the involved passenger transport authorities and transport operators who delivered the necessary data. Based on indicators elaborated in various EU projects a new method of benchmarking applicable in conditions of public passengers services provision was proposed as well as a set of benchmarking indicators, which are enabling the implementation of a comparative study. Pilot benchmarking application was focused on identification of areas with potential of improvement by means of implementation of developed method. Final part of the paper contains recommendations for creation of a functional benchmarking system in a field of public transport services and details the steps that are necessary for the possible extension of benchmarking application to other areas of public passenger transport.

Keywords

benchmarking, public passenger transport, quality, evaluation

1 Introduction

Public passenger transport represents itself important social-economic factor of the surroundings where it operates. It represents services for population where the main task consists of satisfying their everyday requirements for transportation (travelling to work, schools, offices, medical institutions, etc.). On one hand, it means that state tries to support its use and so reduce individual car transport utilization because of ecological, spatial and social reasons. On the other hand, transport companies bound with several duties (e.g. duty of transport operation even with not fully-loaded buses in order to provide transport service within local area for the public, duty of providing social discounts for selected groups of citizens) which are limiting them. These companies are loss-making despite providing financial sources as a compensation of provable loss resulting from agreement on providing performance within public interest. State measures are in most cases insufficient. Therefore it is necessary that transport companies themselves struggled for increase of customer number to cover their expenses as well as reach adequate profit. This is closely connected with the need to change from production-oriented management to customer-oriented management.

According to different sources (Čorejová et al., 2011; Krystek et al., 2010; Jankowska et al., 2014) in actuality the most important customer request in public transport is the quality of service. It is necessary that transport operators focus their attention on its systematic and continual increase. For this purpose there exist several methods. One of them is benchmarking which was first used in 70ties by American and Japanese concerns as an important tool for building quality management system. European companies haven't appreciated this principle in that times and "discovered it" with significant delay, what could be one of the main reasons of being behind in terms of productivity and competition, especially behind the USA. Since 1996 is benchmarking therefore regarded as one of the most influential conceptions for acceleration of productivity and competition increase within globalizing markets of EU member countries.

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2 Approaches for quality assessment

Approaches for quality assessment of services can be divided into approaches based on standardized (closed) concept of quality management and approaches using the open concept. Their overview and basic characteristics are presented in the Table 1.

Table 1 Overview of quality concepts

<i>Standardized concepts</i>	<i>Open concepts</i>
<ul style="list-style-type: none"> • concept of corporate standards • concept of industry standards • concept of ISO 9000 standards 	<ul style="list-style-type: none"> • TQM concept • EFQM concept • MBQA concept
can be applied also at lower maturity organizations	require mature organization
improvement based on audits	audits improvement based on self-assessment
specific model	model setting out general view

2.1 Approaches based on standardized concept

Approach forming this group can be described as normative. They are based on audits, the object of which is to examine the conformity of the actual state of the quality management system with the state of required standard. The audits are conducted by external experts that are the reason of relatively high cost of their applying.

2.2 Approaches based on an open concept

This group of approaches can be organized and conducted by an enterprise using its own resources. This is the reason for which the approaches forming this group can be characterized by significantly lower cost than those listed above. The basis is a self-assessment of the organization. They are targeted proactive – their basic objective is to know their quality levels in order to identify potential for improvement. For the credibility of results is crucial to maintain the basic principles of effective evaluation, namely: the principle of truth, complexity, group work, support from the management and application of the principle of external perspective or impartiality.

2.3 Concept of benchmarking

Benchmarking is a tool which enables quality and effectivity increase of subjects where applied (Soviar and Zavodska, 2011). It is a method that is showing specific practices and processes leading to high performance and at the same time it helps better understanding how these practices and processes work, and leads to the their adaptation and application.

Using benchmarking as the initial point “tutoring organisation” helps keeping contact with the best ones instead of relying on out-of-date ideas or utopias (Mikusova, 2011). Analysis may be focused on company, process or product. Using benchmarking, company obtains information for improvement and development what may and should lead to performance improvement.

Benchmarking is not only process of creation, classification and comparison of collected data but it is principally a dynamic process of information exchange what may be an effective catalyst for changes (Montoro et al., 2000).

According to the source (Török et al., 2012) the main contribution of benchmarking to the quality and effectiveness development in a company can derived from the fact that:

- it encourages and authorizes change management through implementation of innovations and procedures to reach the best performance,
- it affects increase of customer and staff satisfaction as well as increase of company competitiveness,
- from long-term perspective, benchmarking may be extremely important,
- for the determination of strategic goals and identification of programs to reach them,
- it increases consciousness of organisation’s activities and the way how they are performed while it requests significant level of self-evaluation and motivation.

3 Benchmarking of public transport enterprises

The base for successful benchmarking of transport operators is the existence of methodology suitable for conditions within the country where the application of this method will be carried out. This is closely connected with creation of set of suitable indicators which enable benchmarking study realization (Szendró and Török, 2014).

First step in the process of creation of benchmarking indicators is realization of overview of available sources. Currently there exist a number of studies and projects dealing with benchmarking indicators for the area of transport and its application in the practice. As the most significant ones at European level are mentioned in Table 2.

Table 2 EU benchmarking projects from the transport area

BEST	Benchmarking European Sustainable Transport
BEST2005	Benchmarking in European Service of Public Transport
BOB	Benchmarking of Benchmarking
CNBI	Citizens’ Network Benchmarking Initiative
EQUIP	Extending the Quality of Public Transport
ISOTOPE	Improved Structure and Organisation for Transport Operations of Passengers in Europe
LICB	Lasting Benchmarking Area Database
PILOT	Pilot benchmarking exercise
QUATTRO	Quality Approach in Tendering Urban Transport Operations
SBAKPI	Strategic Benchmarking and Key Performance Indicators
UTBI	The Urban Transport Benchmarking Initiative

Apart from the mentioned projects, there should be considered also two standards that are dealing with quality topics in the area of public transport - European standard EN

13816 and European standard EN 15140. These standards are focused on quality enhancement within public passenger transport from the user's point of view.

During the process of selection and redesign of benchmarking indicators it is convenient to respect the following criteria that can be considered as the most important and basic ones:

- Accessibility,
- Understand ability,
- Reliability,
- Simplicity of data collecting,
- Duplicity exclusion,
- Expenses on data collecting.

4 Proposal of benchmarking methodology

Based on the results of pilot benchmarking study developed in cooperation with several Slovak urban transport companies it is possible to divide the process of benchmarking realization into four phases described in the text below.

1. phase: Planning and data collection

The first step of the benchmarking process is to select and define the critical success factors of an enterprise. These are the elements that the enterprise needs to develop, lead and manage, if it wants to succeed in the market. The competitive position of the enterprise can be improved with help of knowledge of the market characteristics and the use of the market. The mentioned factors are not clearly defined for the transport sector. But majority of benchmarking indicators can be added to one of the following areas: cost and tariff policy of an enterprise, maintenance of the technical equipment and a fleet, human resources management, and customer orientation of an enterprise.

The second step in the process is the establishment of indicators that are used for measuring of the critical success factors. The most of indicators established under foreign projects were not applicable in the original form. It was necessary to make selection and transform them. The existence of indicators assigned to the critical success factors greatly simplifies the implementation of benchmarking.

The third step is to measure the indicator values. It is necessary to meet the following conditions to ensure comparability of data:

- to understand the content of the indicator,
- to understand the content of relevant components of the indicator,
- to comply with the determined time period of measurement,
- to comply with the determined measurement methodology.

To meet the first two conditions, it is necessary to understand exactly the definition of the indicator itself and also the definition of its sub-components. If some sub-component is not clear, it is recommended to go to the next indicator. Incorrect filling of values might impair the steps of the process and it may lead to a waste of human and financial resources of the stakeholders.

If it is not possible to meet the required time period or the method of measurement for any reason, it is necessary to draw attention to that fact and mention it. It may serve to explain unusual differences in the final values of benchmarking indicators. In the case that an enterprise has only aggregated data of the indicator, it is necessary to apply the same procedure.

After filling in the indicators file, the file should be sent to a centralized database where it is subjected to further processing. The output should be two clear tables of values whose rows are identified by a numerical code of individual enterprises and columns by numbers of indicators. The second phase of the process starts after obtaining the results from the database.

2. phase: Analysis

The fourth step of the benchmarking process is comparing the indicator values that were measured in the enterprise with the values of the other participants and determining significant deviations from the "best in the business" (the determination of a deviation and its threshold value that is acceptable, an enterprise sets itself). For the indicators with positive polarization, the operator is focused on the highest value achieved. For the indicators with negative polarization, the operator is focused on the lowest values.

The selected indicators should be subjected to a detailed examination which is based on the assessment their linkages with other indicators. The knowledge of partial values of the indicators of the potential benchmarking partner has a significant importance for this activity.

Based on the findings, potential areas for improvement are identified, i.e. the areas determined for further in-depth examination through interviews with benchmarking partners. This represents *the fifth step* of the process, which is also the transition to the next phase of benchmarking.

3. phase: Integration

The identified differences in the values constitute the basis for determining areas in which the enterprise has reserves or the areas for improvement on which attention should be focused.

Recommendation is to focus not only on one of them for every benchmarking cycle so thus it is necessary to arrange them according to the urgency and to pick the area that has the highest priority.

The identified differences in the values constitute the basis for determining areas in which the enterprise has mayor possibilities improvement on which attention should be focused. In the initial implementation of the benchmarking it is highly likely that these areas will be there only few. Recommendation is to focus on only one of them for every benchmarking cycle so thus it is necessary to arrange them according to the urgency and to pick the area that has the highest priority.

After the selection, there is *the sixth step*, which consists in the analysis of the relevant business processes. It is necessary

to describe in detail all the components of processes of the identified area and assess them in a broader context i.e. in terms of the factors which affect the quality of their output.

It is appropriate to use some of the tools and methods for the identification of problems, which are, for example, Pareto analysis, process diagrams, cause-and-effect diagrams, etc. All findings from this step should be documented in detail because all future work with benchmarking partners will be based on them.

Then, it is possible to conclude a benchmarking partnership which is a prerequisite to *the seventh step* of a benchmarking process. Contacting the enterprises should be done with the help of a central database administrator. In the case of dual match in choosing the benchmarking partner, the partner should automatically provide contact information to the benchmarking enterprises (till this phase operators have used the code numbers, no names) and also the partial values of the indicators.

In the case of unilateral interest, the administrator should inform the second party about the possibility of establishing a partnership. Its rejection is possible without any justification given the fact that the benchmarking principle is providing benefits to both parties involved.

The conclusion of a benchmarking partnership lies in the signing a contract for the use of confidential data. Another activity of partners is based on the exchange of information about the way to success in the areas that are subject of the benchmarking. Then, it is necessary to adapt the practice to the specific conditions of the enterprise and the specifics of the environment where the service is provided.

4. phase: Action

Next, *the eighth step* is to plan and implement the improvements. An operator has to set the goals which are achievable, clearly defined, measurable, and time-limited. All employees should be familiar with these goals. Also it is necessary to determine the means for achieving the goals. These means should be grouped to particular alternatives related to the nature of baseline information on future development.

After the implementation of the measures to improve the current situation, it is appropriate to monitor and analyse the situation in a given area at regular intervals. Based on the findings of differences between plans and reality, it is necessary to correct individual activities which have contributed to achievement of that state. Activity with this concept constitutes *the ninth step* of benchmarking process.

It is very important to note that improving enterprise activities is a continuous process. Enterprises should be aware of that “nothing is never done so well that it could not be possible to achieve further improvements”. That is the reason for which benchmarking is a cyclic process. The implementation of the process should continue focusing on further areas of improvements and cooperation with new benchmarking partners.

5 Levels of benchmarking application

Benchmarking is a process of continuous improvement of the enterprise that can be performed on three levels using proposed methodology. (Table 3)

Table 3 Levels of benchmarking application

Name	Content	Steps of realization
Self-assessment	Performance measurement by the transport operator	<ul style="list-style-type: none"> • Selection and definition of critical success factors • Definition of benchmarking indicators for critical success factors measurement • Measurement of indicators values by transport operator
External comparison	Identification of the status of company based on comparison of the data from the database to the data from other enterprises.	<ul style="list-style-type: none"> • Comparison of indicators' measured values to other transport operators • Identification of the areas for improvement • Creation of the review of relevant processes
Partnership	Work with partners based on the exchange of confidential information. Creation of a report on how to execute the processes in the areas identified in the partner company. Adaptation of identified procedures for the specific conditions of one's own company. Scheduling of changes, their implementation and measurement of achieved state.	<ul style="list-style-type: none"> • Learning by application of “best practices” • Planning and implementation of improvements • Status monitoring

The first level represents the basis of internal benchmarking exercise which realization is the most simple because of the relatively easy data availability. It is based on self-assessment of transport operator company and is carried out within the organization own ability, without any need of establishing an *external contact*. To perform internal benchmarking is of course necessary to follow the steps leading to a complete realization of process, with the difference that the partners for comparison are different company departments, enterprises, and so on.

The second level can be described as an *extension of internal benchmarking*. In this level transport operator has to contact the database manager. The following steps of improvement process are based on comparison of the own results with data from external sources. This level enables the operator more sophisticated determination of the strengths and weaknesses of the company.

The third level, known as *external benchmarking*, is the conclusion of a full benchmarking cycle. Its core is a collaboration with other organizations.

It is up to the transport operator for which level of implementation of benchmarking will decide. Generally, application of higher degree at the same time carries extensive advantages.

Set of indicators is applicable to all these levels and considerably facilitates the assessment of the efficiency and quality of the processes on:

- examined departments or branches of company (in the case of internal benchmarking application),
- company as a whole (in the case of external benchmarking application).

6 Conclusion

The benchmarking activities carried out in the area of Slovak urban public transport can be qualified as examination of the conditions for application of proposed method and as a preparation of documents for implementation of the pilot benchmarking project. Methodology adjustment which is presented in this paper within the case study demonstrated its viability and confirmed the potential that benchmarking conceals in itself.

Method used is based on relative best practices to produce benchmarks in compared areas, giving for each transport operator an indication of the remaining potential for performance improvement. The criteria utilized in presented benchmarking application took into account not only quantitative but also qualitative data.

Main benefit of presented and documented approach is that the implementation of this method, in its simple form, does not require large investments and acquirement of the indicators in most cases is not demanding in terms of time, human resources or operational costs. In the study, where the values of two operators from among the organisation of urban public transport in Slovakia were compared, it is possible to express laboriousness and difficulty of obtaining data from the operators' perspective in several hours of work.

The study showed that there exist many obstacles to realization of performance measurements and comparisons caused mainly by different systems of data collecting actually utilized by the Slovak enterprises.

To innovate the benefits of benchmarking, it would be appropriate to extend the set of indicators specific for the area of operators, to assign the weights of importance for individual indicators, and analyse in detail the relationships between indicators. It would be also necessary to include the results of the regular satisfactory survey of passengers and employees into the benchmarking indicators, further to revise or supplement the criteria for selecting a benchmarking partner, and assign business processes, which have a direct impact on the obtained values of the indicators. All these innovations could become the basis for increasing the efficiency and attractiveness of the benchmarking process that can clearly contribute to quality improvement of services provided by public passenger transport operators.

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