

APPLICATION OF THE CSI METHOD TO STUDY AND IMPROVE THE QUALITY OF INTERNET ACCESS SERVICE – CASE STUDY

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Abstract: The paper presents the results of research aimed at assessing the level of satisfaction of individual customers of a company offering Internet access services. The study was conducted using the CSI (Customer Satisfaction Index) method. The study process consisted of 2 stages. The first study conducted in 2017 identified customer requirements and revealed insufficient customer satisfaction with the services provided to date. The analysis of the CSI revealed that customer satisfaction in these areas was not the highest. This state of affairs forced the company to carry out a broad improvement program, which is characterized in this paper. The second study was conducted (in 2019) a year after the implementation of the changes. Owing to this, it was possible to compare customer satisfaction ratings and the customer requirements, as well as to assess the effectiveness of the improvement measures taken. The study allowed to broaden the knowledge about the analyzed service in terms of methods of its measurement and factors having a decisive influence on its quality and efficiency. The service under analysis has been effectively improved.

Keywords: CSI, quality, quality management, customer satisfaction index.

1. INTRODUCTION

One of the basic tasks of the managerial staff aimed at achieving the appropriate level of efficiency and competitiveness of the company is to evaluate and monitor the level of customer satisfaction. This paper presents a case of using CSI analysis to evaluate and improve the quality of the industrial and service process carried out by one of the telecommunications companies operating in Poland. The company, as part of its services, carried out the process of installation of Internet access via fiber optic network within the customer's premises. Due to the high number of customer complaints related to the installation processes and operation of the service, the company management decided to make a comprehensive diagnosis of customer requirements and the level of

satisfaction. Owing to the CSI method, it was possible to identify problems in the area of service quality and implement a wide improvement program.

The first part of the paper describes the results of literature research on the analysis and evaluation of customer satisfaction using the Customer Satisfaction Index (CSI) method. The main part of the paper contains the results of a study aimed at assessing the level of satisfaction of individual customers of a company offering Internet access services. The company provides a comprehensive development of the Internet network at the premises of the recipients. The paper contains the results of two studies. The first study conducted in 2017 revealed unsatisfactory level of customer satisfaction. This state of affairs forced the company to carry out an extensive improvement program. The second study was conducted in 2019, a year after the implementation of the changes. Owing to this, it was possible to compare customer satisfaction ratings and evaluate the effectiveness of the improvement measures taken.

2. DIAGNOSING CUSTOMER SATISFACTION AS A BASIS FOR IMPROVEMENT

Diagnosing and improving customer satisfaction (Wolniak and Skotnicka-Zasadzień 2008) have now become the main tasks of today's managers. Without a proper evaluation of customer satisfaction and its continuous improvement through the betterment of products and services, it is difficult to imagine a lasting market success of a company today. The role of improvement is highlighted in many scientific and practical publications. Continuous improvement of the organization is not only a function of normative management systems (Biały and Hąbek 2016, Ligarski 2010, Midor 2013), but also a condition for competitiveness and existence of companies on the market. Improvement of an organization requires its comprehensive diagnostics. Indicator methods very widely applied in management practice are used for this purpose (Grabowska 2017). One of the basic indicator analysis methods used to assess customer satisfaction and needs is the Customer Satisfaction Index (CSI). This classic method derives from the tools used to build marketing strategies (Ilieska 2013). It is a very flexible tool used in almost every industry, e.g. telecommunications (Zasadzień et al. 2010), education (Ulewicz 2014, Pacana and Woźniak, 2017), logistics (Odlanicka-Poczobutt and Kulińska 2015, Kramarz and Slupina 2017, Paddeu et al. 2017), trade (Gajewska 2015) transit (Eboli and Mazzulla 2009) or e-commerce (Liu et al. 2008). The CSI method allows not only to determine the level of customer satisfaction but also to identify key customer requirements. A systematic satisfaction analysis also allows to start the process of identifying the causes of dissatisfaction and effectively evaluate the improvement measures taken. No effective manager needs to be convinced of the effectiveness of this method in terms of improvement of both products and services.

3. CUSTOMER SATISFACTION ASSESSMENT – INITIAL STATE

A survey of initial customer satisfaction, based on a specially developed set of criteria (Table 1), was conducted in June 2017. The survey was conducted during a telephone interview with customers during which the CSI questionnaire was filled in. Respondents were asked to assess particular aspects (on a scale of 1-10) and their significance (on a scale of 1-5). The study was conducted on a group of one hundred randomly selected customers who used the services for no longer than 180 days. The results of the first study are presented in Table 1.

As a result of the study the CSI was obtained at the level of 68.5%. This level can be interpreted as average customer satisfaction with the service. Due to the market reality

at that time, the indicator oscillating at this level may not have been sufficient to keep the customers and to keep the company competitive. The company absolutely had to focus on improving quality in areas relevant to customers. The results of this study revealed that customers were least satisfied with the quality of the wireless network (4.85). The installation department, in order to produce an imposed, rigid standard of the number of installations per team per day, focused on launching the Internet access service itself, marginalizing the quality of operation of the installation at the customer's premises and the quality of access equipment offered. The highest rating (9.05) was given by customers to the offered price conditions. The situation was a bit different in terms of the importance of factors. The least important for customers was the punctuality of technical staff (3.11), while the most important parameter was the stability of the Internet connection (4.45).

Table 1.

Results of the customer satisfaction survey – initial state

| Id | Satisfaction factor | Factor assessment [Wi] | Factor weight [Ci] | Factor relative weight [Ci/C] | CSI [Wi*(Ci/C)] | |
|-----------|------------------------------|-------------------------------|---------------------------|--------------------------------------|------------------------|--------------|
| #1 | Failure response time | 6.54 | 4.04 | 0.103 | 0.671 | |
| #2 | Punctuality of employees | 8.09 | 3.11 | 0.079 | 0.639 | |
| #3 | Handling of calls | 8.94 | 4.02 | 0.102 | 0.913 | |
| #4 | Aesthetics of installation | 5.37 | 4.17 | 0.106 | 0.569 | |
| #5 | Connection waiting time | 8.54 | 3.96 | 0.101 | 0.859 | |
| #6 | Professionalism of employees | 6.75 | 4.11 | 0.104 | 0.705 | |
| #7 | Connection stability | 5.19 | 4.45 | 0.113 | 0.587 | |
| #8 | Internet speed | 5.91 | 3.81 | 0.097 | 0.572 | |
| #9 | Wireless network coverage | 4.85 | 4.08 | 0.104 | 0.503 | |
| #10 | Price | 9.05 | 3.62 | 0.092 | 0.832 | |
| | | | C | | CSI | CSI% |
| | | | Σ=39.37 | | 6.85 | 68.5% |

Source: Own study

The so-called quality maps (Fig. 1) have been developed for a deeper interpretation of the study results. The figure shows average values for satisfaction (6.92 points) and importance (3.94 points).

The analysis of the diagram allows us to conclude that the areas to which special attention should be paid are the following: #1 Failure response time, #4 Aesthetics of installation, #6 Professionalism of employees, #7 Connection stability, #9 Wireless network coverage. These are satisfaction rating factors classified as particularly important for customers, and which were rated below the average. Aiming to build customer loyalty, the operator faced the need to identify the reasons for such a state and implement improvement changes to raise the quality of services provided.

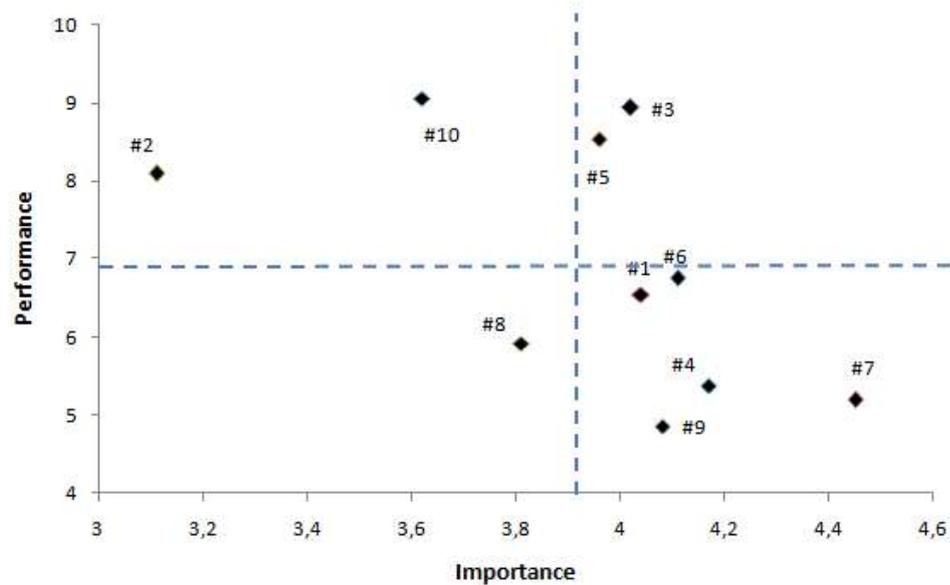


Fig.1. Service quality map – initial state. Source: Own study

4. DESCRIPTION OF IMPROVEMENT MEASURES

Based on the results of the quality assessment, the top management of the company decided to introduce a number of improvement changes. The assessment of the factors that are very important for the customer depended in particular on the standards of customer service and the work of technical teams dealing with the installation of the connection and rectification of failures. As part of the improvement program, the existing operational procedures were verified and new ones were developed and implemented, including changes to the organizational structure. The changes also involved additional investments (modernization of workstations, purchase of equipment, purchase or development of own software). Scheduling of installation work and checklists were introduced. Cyclical trainings for technical staff were introduced. In addition, internal communication was improved and the principle of supporting the Internet installation process by other departments of the company was introduced. As a result, the time for troubleshooting was shortened. Taking into account the needs of customers and to increase competitiveness, the working time was reorganized by introducing evening and weekend duty. The order and delivery system was reorganized, a unit responsible for testing equipment before it is introduced into the network was established, and technical solutions ensuring its continuous monitoring were implemented.

The changes described above would not be effective if they were not accompanied by a change in attitude and awareness of the staff.

5. CSI RESULTS – STUDY 2

After 12 months from the implementation of the improvement changes described earlier, another satisfaction survey of one hundred selected customers who had used the services for a period shorter than 180 days was conducted. A tool identical to the one used in the first study (telephone interview) was applied. The obtained results are presented in Table 2.

Table 2.
CSI – final state

| ID. | Satisfaction factor | Factor assessment [Wi] | Factor weight [Ci] | Factor relative weight [Ci/C] | CSI [Wi*(Ci/C)] | |
|-----|------------------------------|------------------------|--------------------|-------------------------------|-----------------|-------|
| #1 | Failure response time | 8.89 | 4.82 | 0.110 | 0.982 | |
| #2 | Punctuality of employees | 8.56 | 4.23 | 0.097 | 0.830 | |
| #3 | Handling of calls | 9.01 | 4.55 | 0.104 | 0.939 | |
| #4 | Aesthetics of installation | 8.35 | 4.51 | 0.103 | 0.863 | |
| #5 | Connection waiting time | 6.93 | 3.62 | 0.083 | 0.575 | |
| #6 | Professionalism of employees | 8.26 | 4.73 | 0.108 | 0.895 | |
| #7 | Connection stability | 8.87 | 4.89 | 0.112 | 0.994 | |
| #8 | Internet speed | 8.27 | 4.1 | 0.094 | 0.777 | |
| #9 | Wireless network coverage | 6.98 | 4.83 | 0.111 | 0.772 | |
| #10 | Price | 7.85 | 3.37 | 0.077 | 0.606 | |
| | | | C | Σ=1 | CSI | CSI % |
| | | | Σ=43.65 | | Σ=8.23 | 82.3% |

Source: Own study

The results of the second customer satisfaction survey showed that the CSI rose to 8.23 points. The analysis of the results of individual factors showed that an improvement was noted in almost every case. The assessment of seven factors is above the average value. The developed quality map (Fig. 2) indicates that the only important factor assessed below the average is the quality of wireless network operation (#9). Below the average value were customer ratings concerning the waiting time to connect to the network (#5) and the price (#10). However, these are factors that constitute less important aspects of customer satisfaction

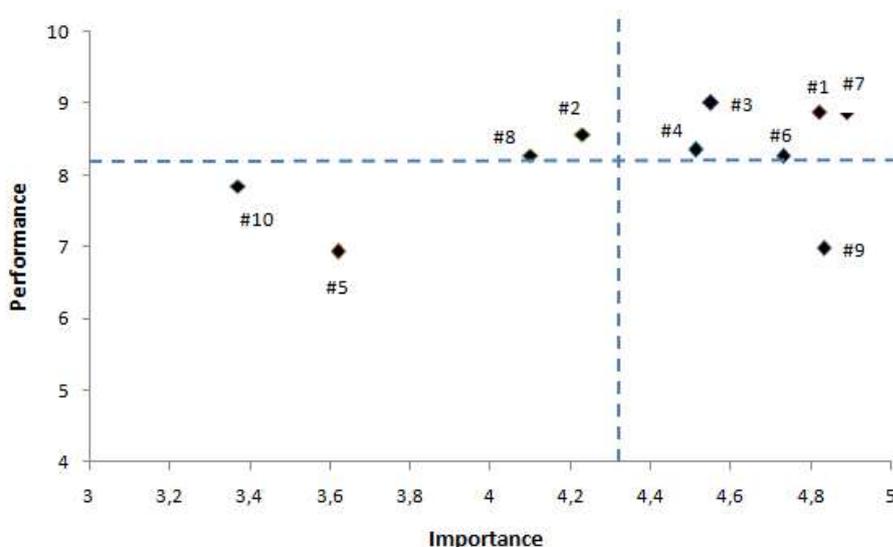


Fig. 2. Service quality map – final state. Source: Own study



Fig. 3. Change of customer satisfaction rating. Source: Own study

Changes in ratings for each of the factors of customer satisfaction with the services of the surveyed company are presented in Figure 3. The analysis showed that connection stability (#7) is the factor that customers perceive clearly better than in the first study (+3.68 points). The company resigned from external service by establishing a separate department responsible for network administration. The policy of successive elimination of old technologies has improved the failure rate. The network topology was rebuilt to ensure its redundancy. Network operation monitoring systems were implemented. The access points affected by the factory defect were replaced and a program of testing the equipment before it was put into production use was implemented.

During the second study, the customers assessed the aesthetics of the installations performed much better (+ 2.98 points) – in this respect, for example, the way the cables were routed was improved (the façade and window joinery elements are not disturbed), the installation of sockets, where it is justified, instead of drilling, double-sided wall tapes are used, the cables are fastened and protected against accidental damage. The installation technicians are equipped with protective shoes, hand-held vacuum cleaners, and the place of installation of the equipment and the cabling must be documented by a photo and is subject to assessment by the quality department.

The modernization of the network and change in the structure of the technology allowed to improve the connection speed (factor #8) made available to end users, which was reflected in the study – the degree of customer satisfaction increased (+2.36 points). As a result of the introduced technical and organizational changes, the assessment (#1) of the failure response time increased (+2.35 points).

A noticeable decrease in satisfaction occurred in the area (#5) of connection waiting time (-1.61 points). When calculating the average installation time, the optimum number of installations per day per team was determined. The source of this state of affairs was a change in the purpose of the operator – the quantity was to give way to the quality of installations. In the second study, customers rated the price offer (#5) worse than before (-1.2 points). This was caused by the increase in service prices introduced by the company.

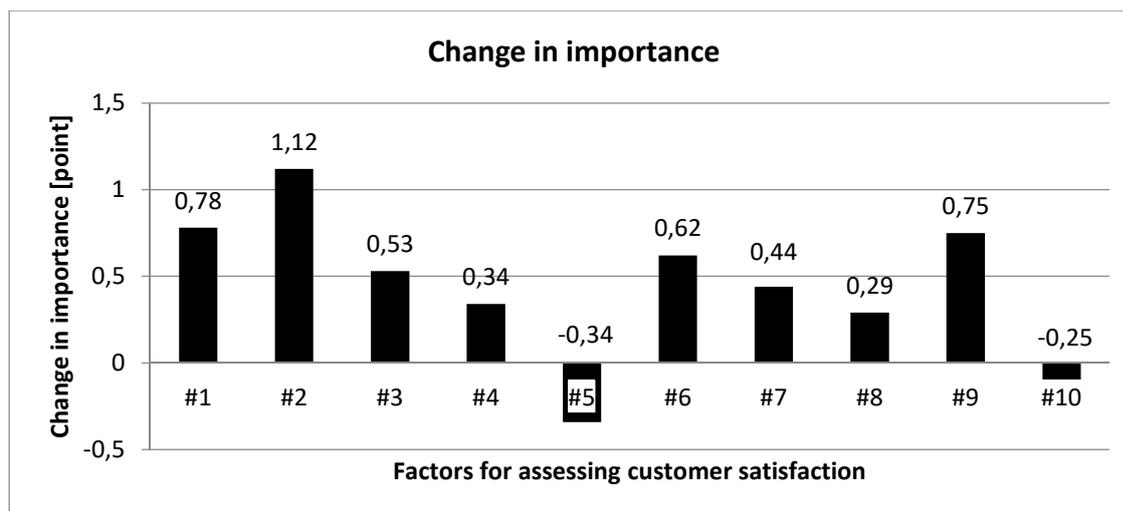


Fig. 4. Change in the importance of customer satisfaction assessment factors. Source: Own study

The results of the second study prove that the most important service parameter for customers is the stability of the Internet connection #7. The result at the level of 4.98 points. (+0.44 points) indicates that this is a critical factor in assessing satisfaction. Customers attach the least importance to the price of service #10, the importance of which was rated at 3.37 points (-0.25 points). Customers in the second study showed an increase in patience concerning network connection. They considered waiting time #5 less important (-0.34 points) than in the first study. The results of the second survey generally show an increase in customer requirements. The importance of almost all satisfaction factors has increased. The highest increase is recorded in the evaluation of parameter #2 – punctuality of employees (+ 1.12 points). An increase in importance was noted in the scope of factor #1 – failure response time (+0.78 points) and #9 – wireless network coverage (+0.75 points).

6. CONCLUSIONS

The paper describes a case of customer satisfaction survey and its analysis and evaluation by means of the CSI in one of the companies offering Internet access services. Owing to the conducted studies, factors determining the satisfaction of individual customers of the examined company were identified. The results of the first study revealed that the most important factors for the customers included: stability of the Internet connection, aesthetics of installation and professionalism of the company's employees. The analysis of the CSI revealed that customer satisfaction in these areas was not the highest. The management of the examined company decided to undertake a number of improvement actions, owing to which the results of the repeated study looked much better. The analysis of the results of the second study revealed the high effectiveness of the transformation performed. The CSI increased from the initial level of 6.85 points to 8.23 points. The CSI is not only an effective tool for assessing customer satisfaction, it is also a good tool for studying trends in changes in customer expectations. In the case under examination, it was observed that the market has become increasingly demanding. The importance of most requirements of customers using Internet access services has increased. Customer requirements only in terms of price and waiting time to connect to the network have decreased. The customers of the

examined company expect high quality, i.e. professional service and reliable access installation, while being aware of their price.

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