



## MEASURING AND DEVELOPING CUSTOMER SATISFACTION - WITH THE BALANCED CRITICAL FACTOR INDEX METHOD

**Mika Kuronen\***, Department of production/Industrial management, University of Vaasa,  
Po. Box 700, FI-65101, Vaasa, Finland  
Mika.Kuronen@student.uvasa.fi

**Josu Takala**, Department of production/Industrial management, University of Vaasa,  
Po. Box 700, FI-65101, Vaasa, Finland  
Josu.Takala@uvasa.fi  
\*Corresponding author

### ABSTRACT

*This short analysis presents perspective and a holistic method for approaching and measuring customer satisfaction. The Balanced Critical Factor Index (BCFI) method is a measurement tool to indicate which attribute of a business process is critical and which is not, based on the experience and expectations of the company's employees, customers or business partners.*

*This paper focuses on to detect and define critical business processes and factors, which have influence to effective co-operation and customer satisfaction. The use of a questionnaire is one of the most efficient approaches to gather the required information. Due to the fact that each process has its own attributes and the questionnaires cannot be standardized, but the information from the phase is essential and could be measured. In this study case company's all gathered information will be analyzed and furthermore the BCFI measurement tools will be applied. The original research has been testified that, with the above-mentioned method (BCFI) customer's experience of the "gap" between expected and received service can be easily resolved. Using this BCFI method it is also possible to find easier so called "weak" customer satisfaction indicators, which are not directly obvious. Companies have crucial to take the right decisions upon the areas of business interest. To have it done, the company should have able to made decisions with the right amount of customers needs. The correct allocation and fast adaption of customer's needs with the right amount of standards is a key to competitive advantage. This paper shows use of this BCFI method and how it could help companies to define there's customer's needs and required development target area more specifically.*

**Keywords:** Customer satisfaction; Critical business process; Balanced Critical Factor Index (BCFI); Method.



## INTRODUCTION

The objective of this review is to introduce Balanced Critical Factor Index method (BCFI) and its use in the development and measuring of customer satisfaction. Original research satisfaction survey answers were collected from two years (2010 -2011) and were totally consisted of 357- answerer from 6 different organisation levels. Study's case company is responsible for the material maintenance and sparelogistics for the Finnish Army and it produces these maintenance services, either directly or managed by its subcontractors. Company is also responsible of the systems, which are related to conversion, integration and outfitting work or materials in some advance determinate projects.

### **How we can describe customer satisfaction?**

How we can describe the customer satisfaction? This question could have as many answers as there are respondents. Customer satisfaction can mean very different things among to the answerer. It may include such factors as delivery time, price, conformity, professionalism, or it is generally just a response to customer' requests. It can also be all of these above mentioned issues or other else factors in a complex mix. The concept of customer satisfaction can be very different in different industrial sectors or even within the same company in the different product lines (Kokkonen 2006.).

General limitation of the customer satisfaction is mostly just thinking that "it comes form a customer on the basis of the needs they are expressed". The starting point for developing customer satisfaction is often not a deep understanding of the needs. Cursory customer orientation may even lead to the situation there companies are adapting and carry out "wrong" customer needs. This situation means that company's strategic planning are even supposed to work up to with customer's wishes. Because neither or party of this, the development of customer satisfaction is in the most cases formed properly "after it has came a serious business development brake". (Storbacka & Lehtinen 2002: 17.).

### **Measuring of Customer satisfaction?**

In general: Customer satisfaction surveys main objective is to measure answerer's satisfaction level of experienced services. Before starting of the measurement process is important to find out some basics: Why you want to carry out chosen measurements? Are they really important and what of these measurements can be really ascertained? In addition to the make successful data analysis, successful customer satisfaction surveys requires right questions with the right scale. Customer satisfaction surveys outcome should be linked to factors, which are most critical to organization's success. A critical success factor is the key business area in the company and that for it must achieve a high level of performance. Organization success can vary and be reliant of many things, but measuring of customer satisfaction should commonly concentrate only a few selected critical success factors<sup>1</sup> (Lönqvist & Pirttimäki 2006).

---

<sup>1</sup>Study's case company did not validate used customer satisfaction attributes to use with the BCFI method



### - An adequate level of service?

One of the good known implementation of customer satisfaction implementation is Zeithaml's etc. (1985) developed SERVQUAL instrument cluster. This method is based on the idea, that the customer's perception of service quality is best formed when customer expectations of service quality are compared to the provided service level. (Zeithaml, V., Parasuraman, A., Berry, L. 1990: 25.). Include to the Zeithaml & Bitner (1996) customer service quality have two level expectations what are: desired level of service and observed service level. Desired service level is the level of service that the customer expects to receive. Between those levels is so-called adequate level of the service, which is still acceptable to the customer expectations. This acceptable service area may be very different depending from the client and the situation. (The customer's expectations, Zeithaml etc. 1996:76-78).

### - The Importance & Performance method

This method is approaching customer satisfaction with importance and effectiveness of the selected service area. This model allows each attribute to be measured with the clear priorities and activities (Martilla & James 1977: 78–79). Used questionnaire can be divided to "important" and "not important" according to the customer's experience and each attribute have also "better" or "Worse" value depending of respondents experience. These importance & performance results can be present and interpreted for example by SWOT analysis (Key & Yavas & Riecken 1994: 36–37.). Figure 3. Importance & Performance review.

## USE OF THE BCFI METHOD

Balanced Critical Factor Index (BCFI) method has development in the University of Vaasa 2010. It calculates the standard deviation of the given question attributes. BCFI method can be used to find (from research attributes) the most critical attributes, which may be assumed to be the most importance for formation of organisation, but also the permormance. The BCFI formula takes account all expected values and experienced values into demanded activity or service related. Into Formula placed values "total" is the so-called BCFI value. Question attributes are more significant then BCFI value is closer to the value of zero (0), but also those attributes, which value is considerably higher than the other values are significant. BCFI method produces the best benefit if the past and future values can be calculated separately, but the method is however developed in such a way that these values can be counted separately. Generally BCFI methods divide processing of the material into three phases, which are:

- *The current assessments of the situation and the observation of situation,*
- *Determination of appropriate attributes to find critical factors,*
- *Data analysis with the BCFI method.*

Step one (1) include a preliminary mapping of organization needs. This step aim is to find necessary processes, phenomena, and the people who have influence on the matter. Step two (2) purpose is to identify and define all necessary attributes that are linked to the above matters.

Questions respondents assessments task is to quantify the importance of these attributes with numerical value: in the past and future tense, and this gives the content of its weight. In the third (3) section is data analysis stage which is carried out throughout the following formula<sup>2</sup> Figure 1:

<b>GAP INDEX (GI)</b>	$\left  \frac{(\text{av. of expr} - \text{av. of expc}) * 1,3}{10} \right  - 1$
<b>DIRECTION OF DEVELOPMENT INDEX (DDI)</b>	$\left  \frac{(\text{better \%} - \text{worse \%}) * 0,9}{100} \right  - 1$
<b>IMPORTANCE INDEX (II)</b>	$\frac{\text{average of expectation}}{10}$
<b>PERFORMANCE INDEX (PI)</b>	$\frac{\text{average of experience}}{10}$
<b>STANDARD DEVIATION EXPECTATION INDEX (SD expc I)</b>	$\left( \frac{\text{SD of expectation}}{10} \right) + 1$
<b>STANDARD DEVIATION EXPERIENCE INDEX (SD expr I)</b>	$\left( \frac{\text{SD of experience}}{10} \right) + 1$
<b>BCFI FINAL FORMULA</b>	$\frac{\text{SD expc I} + \text{SD expr I} + \text{PI}}{\text{II} * \text{GI} * \text{DDI}}$

Fig. 1. The BCFI method formula

### - General findings?

All respondents and groups deliver almost same results (shaped curve), when results were compared to each other. All defendants had all the questions very high expected values, which exceeded almost invariably themselves for the success of the estimates, what was given (figure 2. Average expected values and results).

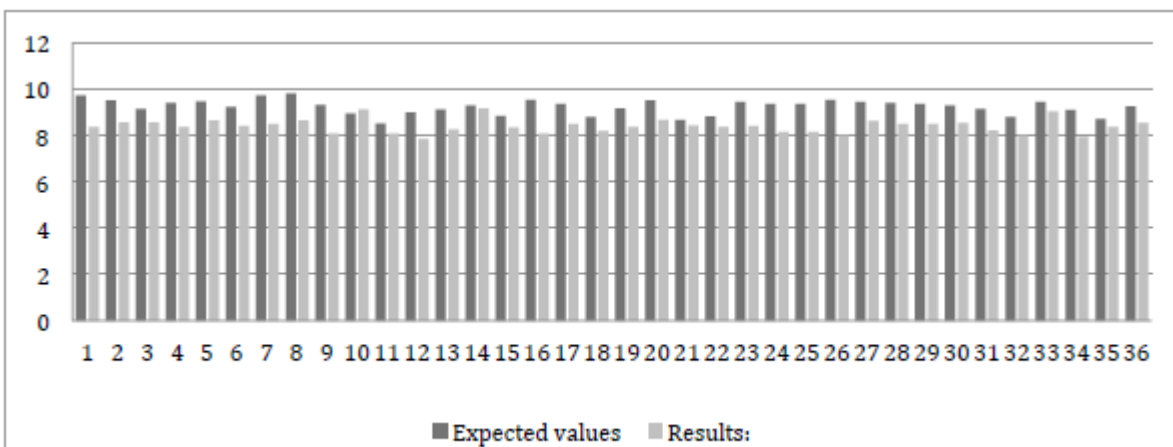


Fig. 2. Average expected values and results

<sup>2</sup> Forss & Takala & Korpi & Golovko 2010

### Main results with the BCFI-method?

Questions (1–13) BCFI values are clearly higher than the values of rest of questions. Below is presented organisational management par table, but rest of groups gave very same kind of results. Results' ranging with the BCFI was from ~ 0.10 up to 1.40. (Figure 3. BCFI values).

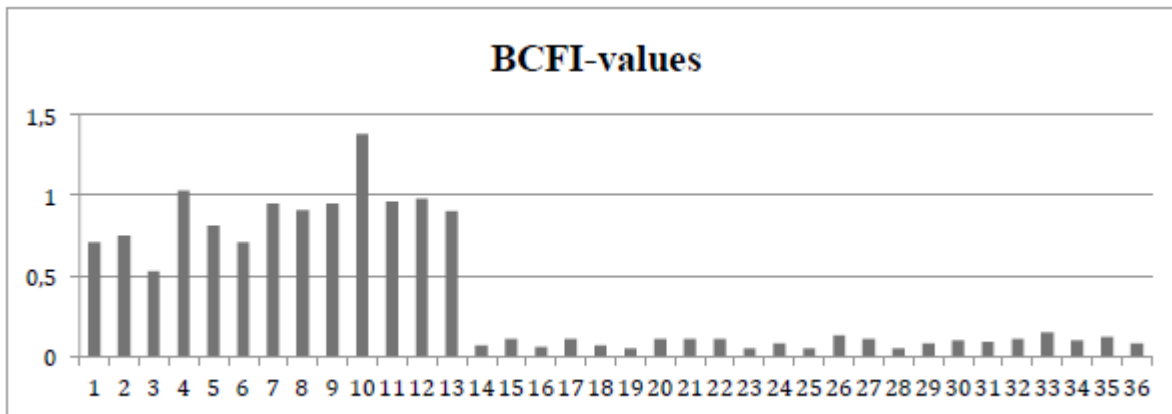


Fig. 3. BCFI values

### CONCLUSIONS

If we compare these results to the adequate service areas, more precisely the main target is in the experienced service in quality, availability and delivery. This is interesting because expected and received service levels are where not indicating anything like that? An adequate level of service thinking could lead to wrong conclusions? According to these BCFI values, the customer satisfaction "gap" is not customer service itself or generally lack in all services. These results are now clearly pointing to questions 1–13, which are presented below:

1. *The ability to understand the customer's business,*
2. *Cooperation in general fluency,*
3. *Operational flexibility,*
4. *General efficiency,*
5. *Customer orientation,*
6. *Goal of activities,*
7. *Openness and honesty in collaboration,*
8. *Reliability partner,*
9. *Observing the Customer needs,*
10. *Anticipating of changes,*
11. *Communication and information sharing in general,*
12. *Communication/ information sharing clarity*
13. *Continuous development.*

**- The gap in communication or quality specifications?**

Low BCFI values in questions 14-64 could mean that company have erroneously decoded data expectations and management will have a lack of information about the organization. Now seems that, customer is dissatisfied of certain services specifications. There could be too many layers of the organization, which will stop or change the information that comes through from the customer. A main objective in quality specifications may not be a clear and the design of services could be inaccurate or self-design process could have insufficient. The quality of services could not committed to a an sufficient extent and these quality gaps could means that the service separation are not uniform with consistent quality expectations. Questions 14-64 are presented in appendix 1.

**- The service delivery gap?**

Specifications could be now too complex or rigid and the specifications are therefore not enough accepted. The protocol was not enough to consistent with the company's culture and service delivery was mismanaged. All these delivery involved gaps means that technology or systems do not support all the activities. These results get support from Importance & Performance method, Figure 3: Importance & Performance review:

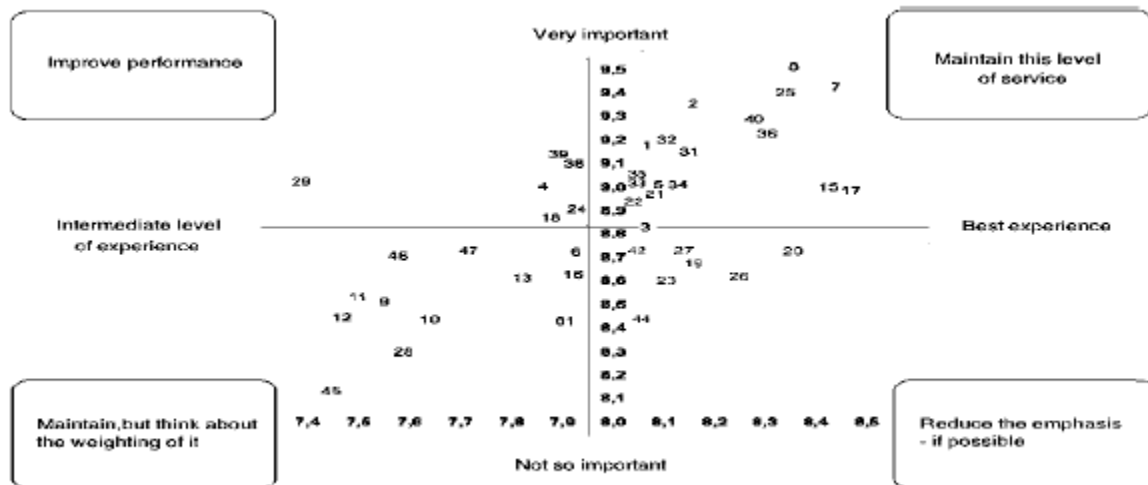


Fig. 3: Importance & Performance review

**- Things to be improved?**

- Question 4: The efficiency of service,
- Question 18: Service speed,
- Question 24: Change/problem situation management,
- Question 29: Information sharing in missing or problematic deliveries
- Question 38: Delivery capacity,
- Question 39: Delivery accuracy.

## RELIABILITY OF THE STUDY

Research empirical material is based on the results of case company's customer satisfaction survey, which was performed by years 2010–2011. Customer Satisfaction wetted a total of 64 questions. Study's original customer satisfaction data was possible to divide into different levels of the organization and there was also possible to pick up the same respondents for the years 2010 and 2011. Research defendants there the Finnish Armed Forces maintenance regiments employees. They there grouped by levels of the organization as follows. To verify study's information between survey respondents they were also asked information about the their's position, organization code and post office code. Organization levels where:

1. Management of the organization,
2. Material projects and procurement,
3. Maintenance management,
4. Maintenance and logistics planning and control,
5. Maintenance supervisory responsibilities,
6. General maintenance tasks.

The original survey was performed with qualitative and quantitative methods. Standardized quantitative statistical research methods can be used in variety ways for analyzing data. The numerical values importance conclude are the measured results statistically significant or not significant. Normally the most commonly used significance is 0.05 and separation or dependence can be almost considered to be statistically significant, where  $0.01 < p < 0.05$  and significant, when  $0.001 < P < 0.01$  (Uusitalo 2001: 82). For testing relationship of variables are commonly used two dimensional testing and this test is based on two or more statistical variable. Suitable method for analyze results is a cross-tabulation, which explains rated effectiveness of two variables against each other, and the Pearson correlation coefficient, which is the most commonly used method. This method can be use to test two or more variables dependencies. In general using only these two methods it is not recommended to made causal conclusions, because these methods shows only the linear dependencies (Heikkilä 2000: 191–202.). In this research study material contained attributes are evaluated with average testing and the standard deviation based on the BCFI method. The significance of the results where obtained, but the difference between dependencies should evaluate by reflecting it to whole framework.

## REFERENCES

1. Hirsjärvi, S., Hurme, H. (2000). Tutkimushaastattelu. Teemahaastattelun teoria ja käytäntö. Helsinki: Yliopistopaino.
2. Heikkilä, Tarja. (2001). Tilastollinen tutkimus. 3. uudistettu painos. Helsinki: Oy Edita Ab.
3. Homburg, C., Rudolph, B. (2001) Customer satisfaction in industrial markets: Dimension and multiple role issues. *Journal of Business Research*, Vol 52, No. 1, 15–33.
4. Keyt, John. C., Yavas, U., Riecken, G. (1994). Importance – performance analysis. *International Journal of Retail & Distribution Management*, Vol. 22, No. 5, 35-40.
5. Kokkonen, Olavi. (2006). Asiakastytyväisyys kaiken perusta [online]. <<http://www.sixsigma.fi/?sivu=Artikkeli&id=90>>.



**Proceedings of 2013 International Conference on  
Technology Innovation and Industrial Management  
29-31 May 2013, Phuket, Thailand**

6. Lönnqvist, A., Pirttimäki, V. (2006). The Measurement of Business Intelligence. *International Journal of Information System Management*, Winter 2006 Vol 23, 32-41.
7. Martilla, J. A., James, J.C. (1977). Importance & Performance Analysis. *International Journal of Marketing* (1977).
8. Storbacka, K., Lehtinen, Jarmo. R. (2002). *Asiakkuuden ehdoilla. Asiakkuuden armoilla. Viides painos.* Juva: Täydellinen Asiakkuus OY ja WSOY WS Bookwell Oy.
9. Takala, J., Nadler, D. (2010). The Development of the Critical Factor Index Method. *International Journal of Services and Standards*.
10. Teppo Forss, Josu Takala, Heli Korpi, Ivan Golovko 2010. Sustainable operative housing by dynamic renting. *Management and Production*. Vol 1. Number 2. July pp 10 -20.
11. Zeithaml, V.A., Bitner, M.J. (1996). *Services marketing*. McGraw-Hill. Zeithaml, V., Parasuraman, A., Berry, L. (1985). A Conceptual Model of Service Quality and its Implications for Future Research. *International Journal of Marketing*. 40-50.
12. Zeithaml, V., Parasuraman, A. & Berry, L. (1990). *Delivering Quality Service. Balancing Customer Perceptions and Expectations*. New York: The Free Press. Zeithaml, V.A., Bitner, M.J. (1996). *Services Marketing*. McGraw-Hill.





Proceedings of 2013 International Conference on  
Technology Innovation and Industrial Management  
29-31 May 2013, Phuket, Thailand

Proceedings of the TIIM2013

APPENDIX 1:

Question attributes 14-64:

- |  |   |
|--|---|
| 14. What items needs development in general*                     | 42. How would you like to improve supplies and logistical efficiency in the future? *         |
| 15. Services availability?                                       | 43. Quality of advisory services?   |
| 16. Is communication sufficient?                                 | 44. Access to education?  |
| 17. Company's willingness to serve?                              | 45. Billing accuracy/clarity?   |
| 18. Speed of service   | 46. Complaints handling?  |
| 19. Speed for responding to calls                                | 47. How would you like company's support processes developing in the future?*                 |
| 20. The willingness to listen                                    | 48. Company's success, overall?   |
| 21. The ability to understand the needs                          | 49. A: Are all services produced with the one stop principle?                                 |
| 22. The ability to find solutions and meet the needs             | 50. B: Is company a neutral and impartial in producing this one stop principle?               |
| 23. Contract management  | 51. Which way would you rather receive company's press releases? By letter or electronically* |
| 24. Change and problem situation management                      | 52. How company should consider developing of e-services?*                                    |
| 25. Meaning for you - keeping promises?                          | 53. Other feedback or suggestions for company? *  |
| 26. Meaning for you - ability to receive feedback?               | 54. Do you hope that company will contact you?  |
| 27. Meaning for you - activity in cooperation?                   | 55. Which particular things or case?  |
| 28. Information sharing in a missing or problematic delivery?    | 56 - 57. Best time to contact* ( 56, 57 where almost same questions)                          |
| 30. The availability of services?                                | 58. Coverage of services?   |
| 31. The quality of services?                                     | 59. How company's operation progressed in last the year*                                      |
| 32. Performance of services?                                     | 60. How company's support processes developed during the past year*                           |
| 33. Conformity of services?                                      | 61. How company's logistics are developed during the past year*                               |
| 34. Ability to support customer activities in the past year?     | 62. How company's services are developed during the past year*                                |
| 35. Company's ability to produce annual ordered services?        | 63. How company's customer service or support to services are develop during past year*       |
| 36. How would you like company's services develop in the future? | 64. How company's services support your activities*   |
| 37. Company's ability to deliver ordered goods?                  |   |
| 38. Deliveries accuracy?   |   |
| 39. Are deliveries exact?  |   |
| 40. Company's response rate in transformation situations?        |   |
| 41. Flexibility to order and delivery changes?                   |   |

Response asked with verbal answer \*

---