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Determining quality functions of CEP (courier, express, parcel) services

Abstract

Nowadays quality is getting greater of importance both in the field of industry and services. There is a close relationship between the customer satisfaction and quality function, level of quality (or lack of quality). The paper presents a method by which the development of quality functions can be based on a structured set of customers' requirements.
The state-of-the art approaches reject the „traditional" linear correlation between service level and customer satisfaction, some of the functions are non-linear, digressive or progressive (see Kano model (1984)). Following the Kano model resources can be allocated in the most effective way.

Key words: CEP, value concepts, service quality, customer's satisfaction, Kano model

1. Introduction

Marketing and logistics is in strong connection with each other in every firm through purchasing and in sales or distribution processes. The scope of *logistics* goes well beyond transportation. Logistics forms the system that ensures the delivery of the product in the entire supply chain. The impact of logistics in the ability of a company to satisfy its customers cannot be overstated. All other efforts at modernization within a company would not bear fruit until the logistics system is carefully designed to facilitate the smooth and efficient flow of goods in the system. The need to keep the chain lean and responsive is priority.

The theory of *marketing* has evolved from production, product and selling concepts of 1970's to the marketing concept of 1980's. The accelerating pace of change has led to viewing the entire business as a process to deliver value to the market at a profit of 1990's. At present, competition is time-based: who can provide the most value for the lowest cost within the shortest time (Stalk 1992).

So significant is the impact of marketing and logistics of value delivery that the 2000's has been termed as time and networks decade fostered by the present business environment, advances in information technology, globalisation of trade, networking of economies and intensified competition in limited time. The customer of today has many alternatives to choose from and is more informed than the past. At the same time the time-value and the place-value of products are increasing for the entities of supply chain and also the consumers.

2. Value concepts

Most researchers agree that logistics contributes to customer satisfaction. Customer service is such a service-package which meets customers. That's why the value of logistics can be obtained to customers by customer service. But what is value for customers? According to Dumond (2000) there is a need to distinguish between price and its worth. Price belongs to suppliers but value belongs to customers. He defines customers' value as the rate of some advantages and opportunities, where the total cost means opportunity and perceived value (quality, physical and service patterns).

The operalization of value is different by various disciplines. Marketing managers, engineers, economists in specific frames postulated by them, have interpreted the concept of value. In marketing literature value is performance (quality) and price (Patterson-Spreng, 1997). In this case it's supposed that perceived performance or quality determine directly the value. The marketeers define it as the perceived worth of benefits received by a customer in exchange for the price paid for a product offering (Anderson, 1994). He views value in business markets as worth in monetary terms of the technical, economic, service and social benefits a customer company receives in exchange for the price it pays for a market offering. Zeithaml et al. (1985) find value-even in single product category as highly personal and idiosyncratic. The economists consider the value as equivalent to utility per unit of price. From the side of quality is mentioned the two components of value: quality and price, where quality contains the product and the level of customer service. According to Kaplan and Norton (1998) consumer's value assumes all the characteristics that firms provide for customer's satisfaction. This couple of authors define three categories in connection with customer's value.

1. The characteristics of products/services
    - Function
    - Quality
    - Price
    - Time
1. Relations to customers
2. Image

According to exploratory studies definitions of customer's value can be grouped into four categories:

- Value is low price
- Value is whatever I want in a product
- Value is quality I get for the price I pay
- Value is what I get for what I give

Zeithaml (1985) captures four consumer expressions of value to an overall definition of perceived value as "consumer's overall statement of utility of a product based on perceptions of what is received and what is given." Value is thus a complete bundle of benefits of an offering weighed against the total price to acquire and use the offering.

The most popular approach is by microeconomics: economic utility according to four basic utilities (time-, place-, form- and possession utility) which exists at the same time and can mean value for consumers. Logistics value means – according to the theory of economic utility – time- and place utilities.

3. The value elements providing by logistics

Value conceptions are present in logistics literature as well. Most researchers generally determine how logistics creates value.

Three main areas have been defined:

1. effectiveness
2. efficiency
3. differentiating

The possession-, consumer-, place- and time-value of products is different but it is the result of correlative processes (Chikán, Demeter 1991). *Possession-value* is the only one which can be separated from the product. The right of disposal over a product determines with what we can make a decision in connection with a certain product even before its production.

Consumer-value is created through production which is basically determined by the quality of the product but it can be also influenced by the time and place of its access. These two latter values are value-categories created by logistics. Place- and time-value can be interpreted only in relation to consumer-value because we can decide about the optimal time and place of consumption only by obtaining consumer-value and only in accordance with it.

The dematerialization of products (Hámori, Szabó 2004) causes a special situation in consequence of which the products, wholly or partly, become virtual (for example music, pictures/films, texts/books, etc.). The steps of their selling are also available in an electronic way and the more time-consuming processes can be accessed virtually (for example delivery, payment). In consequence, the channel of distribution changes (e-commerce via the Internet and by some other alternative solutions), it becomes shorter and direct. Practically, place and time limits disappear form sales (non-stop and can be reached from anywhere). Logistics, which is responsible for the delivery of goods, has to face a big challenge because it has to make a follow-up in the case of physical products as well.

3.1. Time-value

Time-value becomes more important as it is determined by the lead-time between the appearance and the satisfaction of demand (Hartványi, Nagy 2007). It is maximal when the search-production-obtaining of the product does not have any time-requirement, that is to say the demand can be fulfilled immediately at the moment of its appearance.

Time sensitivity is different with each consumer and product. We can speak about time sensitive consumer segments and also such kinds of products which are very sensitive to any waiting or delay. The willingness of waiting is in relation to the importance of the product and its substitution. With the first one, the waiting-willingness is in direct proportion while with the latter one it is in inverse ratio.

Its formation determines the amount of the opportunity cost of waiting of a product for the consumer. Waiting means opportunity cost, the cost of which comes from waste-time and waste possibilities. Time – in resource environment – behaves as a capacity which we have to use efficiently. The consumer is always willing to wait as long as the advantage of sacrificed possibilities is lower than the benefit coming from the product, or the cost of waiting does not exceed it (for example unutilized capacities).

It is rather frequent in production-consumption that there are no possibilities for replacement (rare raw-materials, spare-parts waiting to be built-in, semi-finished goods, etc.). In this situation the consumer's willingness does not decrease with the progress of time, the time-value is constant. If the product is too distant, the time-value becomes zero. It can prevent consumption. In its opposite situation when time can be accelerated and when the product is worth everything (e.g. life-saving instruments, the prevention cases of disasters).

3.2. Place-value

The main elements of consumption are "then" and "there". So far we have discussed the topic of "then" but we cannot separate it from the problem of "there" either (the place of consumption). It is also the so called *place-value* of products. The farther the product is from the consumer, the less valuable it is for the buyer. The decrease of place-value is in proportion with the distance which is measured by transportation cost. The extent of the willingness of payment depends on consumer value, more precisely on how important it is considered to be by the consumer. Its importance can be separated from the real-product-utility.

Economics and marketing oriented researches recognize that longer lead times might have a negative impact on customer demand. There is a well-known a model where demand is a function of actual delivery time and price (Hill, Khosla 1992). The firm's objective is to maximize profit by optimal selection of price and delivery time.

4. Value delivery in logistics

The growing significance of logistics can be proved by the changes in the focus of competitions in industry.

Competition first appeared in the field of costs and then value-creation came into focus: who is able to provide the most value for the lowest cost. At present, competition is time-based.

Drastically changes can be detected in the focus of logistics in the last one or two decades: it has focused on, the integrated process management, instead of the management of individual functions, and the view of supply chain management has been taken in focus. The organization of logistics basically influences the success of supply chain, because the factor of time and flexibility get an important role.

In next chapter I make a short summary of CEP (Courier-Express-Parcel) area in order to make clear the circumstances among which services can operate.

4.1. Definitions, market situation in CEP (Courier-Express-Parcel) services

Connecting the links in the supply chain needs transport, which is usually served by transportation firms. Time has become a source of competitive advantages; it has opened a market gap, where the CEP (Courier-Express-Parcel) services have appeared. CEP, as a special logistics sector, provides the time-guaranteed delivery time faster than other forwarding services. The appearance of these services accelerated global changes as well: global procurement and distribution, changed industrial structure and changed consumption structure.

The *definition* of CEP is the following: forwarding service in which the consignment is delivered within a given time period, or in a given time. The origin of the name CEP is from the German MRU (Manner-Romberg Unternehmensberatung Gmbh). From the beginning of 80', when the CEP first appeared the meaning has been developed so has the market by now (Hensher et al. 2001).

Courier

Services by which the consignment is delivered „immediately" by (motor) bike, by car or on foot generally (but not exclusively) within a city/town/region. The courier is controlling the consignment during the entire process, no handover, the same person picks up and delivers the consignment.

Express

Indirect forwarding services, generally involving „hubs" central processing facility, when the consignments are handled, sorted. New element is the time guarantee and the door-to-door service.

Parcel

Time guarantee forwarding service for small size/ weight (max 50 kg) consignments that can be handled without machines.

4.1.1. The market structure

There is a fierce competition with many actors on the market. The actual size of the market cannot be measured exactly for many reasons, estimations have been published. The classification of service packs (product) is very hard, because there is a remarkable overlap between the CEP segments.

The CEP services belong to an exclusive category because they provide fast and punctual delivery. Their clients are time sensitive, the main value is time, more precisely, fastness and punctuality. CEP firm's activity is presented in every link in supply chain, from delivery to the final customer as well. The alternative solutions in distribution (e-business) find the express transport more important (door-to door shipments). In sales (e-commerce) – without shops – when it is not the buyer who goes to product but the product goes to the buyer, the courier and parcel services improve. Express services are needed within short cycle time, high value goods are required and they have to move in a supply chain.

The time sensitivity dominates over the price sensitivity. This is underlined by an own research made in 2004, (Süle, Tóth, Földesi 2004) in which the variables of quality (allover fastness and punctuality in delivery time) precede the service price. This empirical research has studied amongst others the quality expectation of CEP services on a representative sample of Hungarian firms. Other Hungarian researches have revealed that rapidity, punctuality and reliability are the first three demand-elements of quality, according to customers and potential customers as well. Customers increasingly need reliable, short delivery time services and they are willing to pay more for it. Customers know exactly how fast service they buy.

The faster the service is, the more expensive it is. It can be seen by increasing market volume and increasing price level (in contrast to the traditional shipment services).

While the time consumption of the firms in production is not visible for the customers, CEP activity is on display, the performance of its parts is perceived by the customers, these influences the customer's satisfaction. More orders are fulfilled by long term contracts. There are also individual orders.

5. The planning of service

The process of value delivery is divided into three components namely choosing the value, providing the value and then communicating the value. Choosing the value is a set of activities undertaken before the product (offering) is developed. It starts from customer segmentation for a focussed selection of the markets and then developing value positioning. The component of providing the value undertakes product development on the basis of chosen value. This includes operations of manufacturing, sourcing and distribution of the value offering (product).

The planning of transportation service (due to so-called HIPI specialities: heterogeneity, intangibility, perishability, inseparability) isn't an easy task. The aim of CEP service is basically the change of the place. The way we do it will create different service types.

To all these services can add some special services which meet different needs. Their planning has a vital important in such cases when the choice among services will be determined mainly the quality of the given (offered) service.

5.1. Aim of quality analysis

Despite all efforts, many product planning projects fail and lead to the introduction of products that do not meet customers' expectations. A high level of customer satisfaction cannot be obtained. On the other hand in many product development projects the process of product development is conducted very insystematically and resources are wasted because of a lack of communication between the different functions involved in product development.

Time especially is a critical factor within product development as time to market is becoming increasingly more important (Matzler, Hinterhuber 1998).

Provided that the different service packs (or we can use the term: „product") are to be fit to the users, the customers' quality requirement must be used as e basis. For the sake of simplicity assume that quality is the set of features of a given product. That can meet needs (or make the user satisfied). Analysing special transport services such as CEP, quality is a complicated category (since the general features of transportation: no chance for re-work, immaterial, the customer is a relevant actor in the process etc.). There are several methods to clarify quality, in order to:

- increase customers satisfaction
- increase the efficiency of resource allocation

In the proposed method the formally stated and also the informally expected demands can be considered in the development of quality functions.

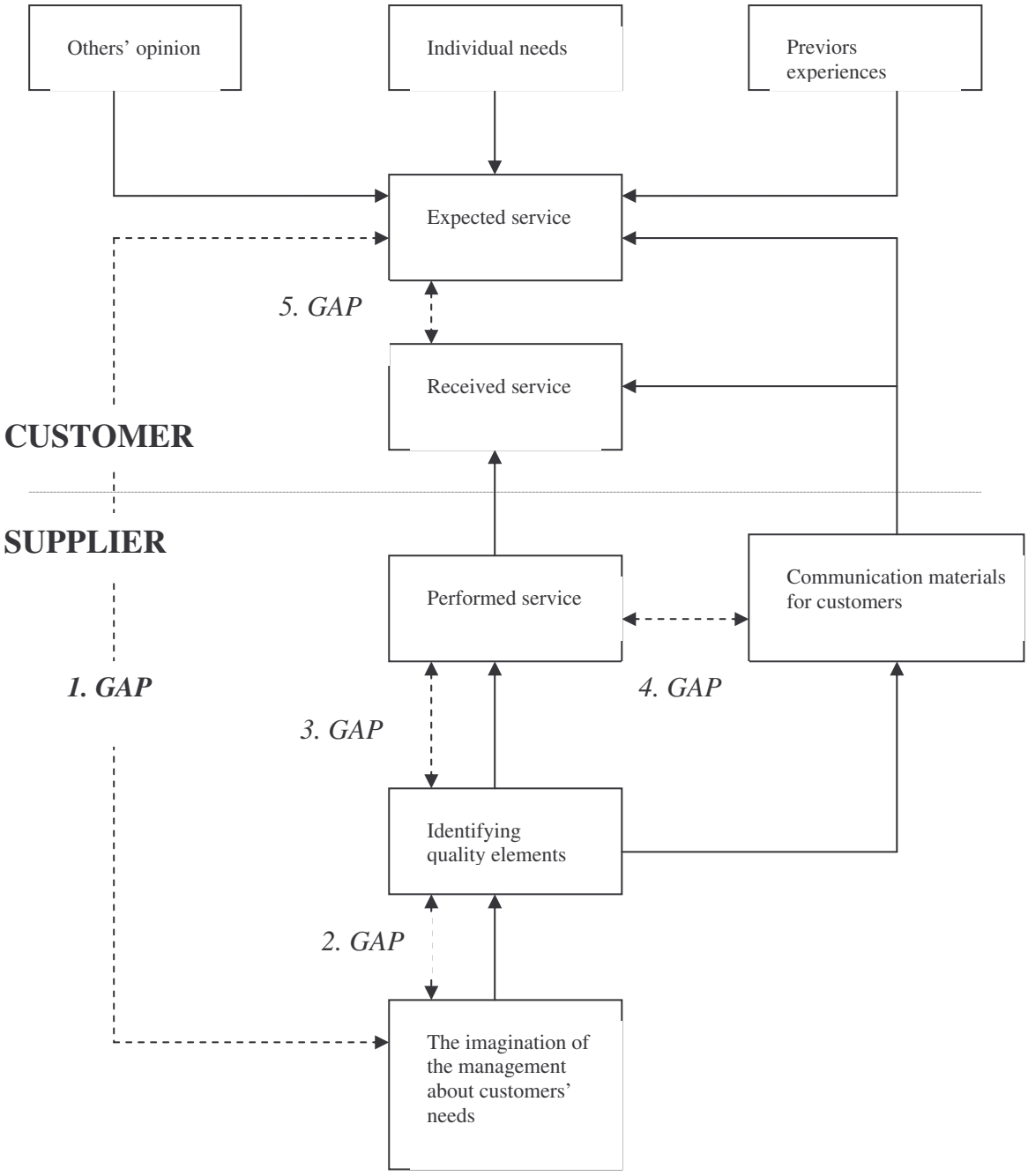
5.2. Traditional methods

There are many different methods do analyse the customer requirements, provided that the demands of he same customer group are similar.
The aim of the analysis is get the desired and offered quality level closer to each other.
It can be stated, that those companies are successfully who can "translate" the unstructured customer requirements into an adaptable form. Companies should have some kind of counselling ability, sensitibility for transforming the "voice of customer" to "voice of process" (Tenner, De Toro 2000).

5.2.1. GAP model

Because of strong competition even the smallest service-element has an influence on the attitude of customers. As a service it is not all the same where we concentrate all our limited resources. This fact will increase the importance of service-planning, the aim of which is to provide proper needs, or to reduce to the smallest amount those differences which can be seen very well on the gap-model offered by Parasuraman (1985) (Figure 1).

Figure 1. GAP model



Source: Parasuraman – Berry – Zeithaml (1985)

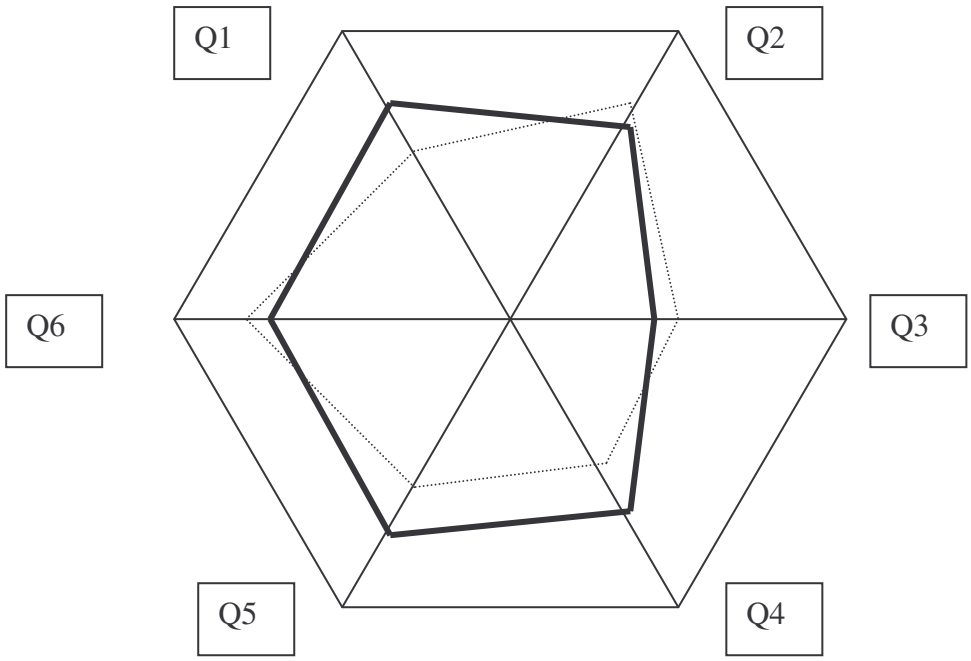
5.2.2 Quality Function Deployment

The difference between the desired and perceived service can be seen in the 5th gap (on model 1), which can be the root of all other gaps. To handle the 1st gap we should use a perfect method called „Quality Function Deployment" QFD (Matzler, Hinterhuber 1998), which occurs between customer's demand and its service-perception (Koczor 2001).

5.2.3. Quality polygon

One of the solutions is the so called quality polygon (Koczor 2001) (see Figure 2). It offers the possibility to determine different quality parameters with various dimensions, on the other hand it can be used for the evaluation of a given service. The important elements of the quality are scaled on the axes of a circle diagram. On each axis the percentage of fulfilment is represented as well. Thus the comparison is very clear if the upper and lower limit of given parameter are determined in advance. The lower bound is the level of rejections (the minimum customer requirement), the upper limit depends on many things, amongst others the technological possibilities, the "benchmark", or the customers' ideal desire. Analysis is done by comparing the polygons determined by the chords. If the polygons are coincident it means the accurate fulfilment of demands. In order to analyse and compare the satisfaction/dissatisfaction with the offered service level the measurement of processes and outputs must be established. One of the simplest ways of doing that is to describe the quality elements by quantified indexes.

Figure 2. Quality polygon



Source: Koczor (2001)

The method leaves several questions unanswered (e.g. which parameters are the most important ones, what is the order of parameters etc.) So this method as a starting point of analysis should be supported by other tools such as correlation analysis, weighting expect system etc.

An other spectacular method is to represent the satisfaction and importance in the same diagram measuring them on a 3 or 5 grade scale. (The good solution is the right diagonal).

Similar to this satisfaction can be compared to other features as well, and competitive analysis can be done in the same time. The Hungarian Post measures the quality/price ratio of its courier service, comparing to the competitors (Bárányi, Koncz 2004).

6. Source of data

After identifying the main customer categories a representative survey can provide a database that can process from many points of view.

The main customers groups we can be focused:

- recent customers
- segment of recent customers
- leaving customers
- customers of competitors

Parallel with actual data collecting personal interviews can be very instructive, such as interviews with:

- front office employees (phone or personal sales)
- couriers, truck drivers
- claims managers
- anyone who has direct connection to the customer

An adequate and systematic collection and classification of these data refer the actual customer requirements. Companies that have ISO 9001 quality management system are to observe the customer satisfaction any way, and the best observation practice is fit to the products and customers.

We carried out Hungarian survey in 2004 (Süle, Tóth, Földesi 2004). The analysis verified that there is no significant gap between the actual customer's requirements and the offered quality parameters.

The set of quality parameters is the quality requirement that describes the features of the product either determined by some written document (law, standard, and contract) or expected by the customer's declaration on quality, so the most important quality parameters are:

- reliability
- fastness
- accuracy
- flexibility
- traceability
- price

The question is that which parameter in which customer group should be considered and how important they are?
(Remark: some literature states that price is not a quality parameter, here we consider it as a customer requirement.)

7. Quality levels

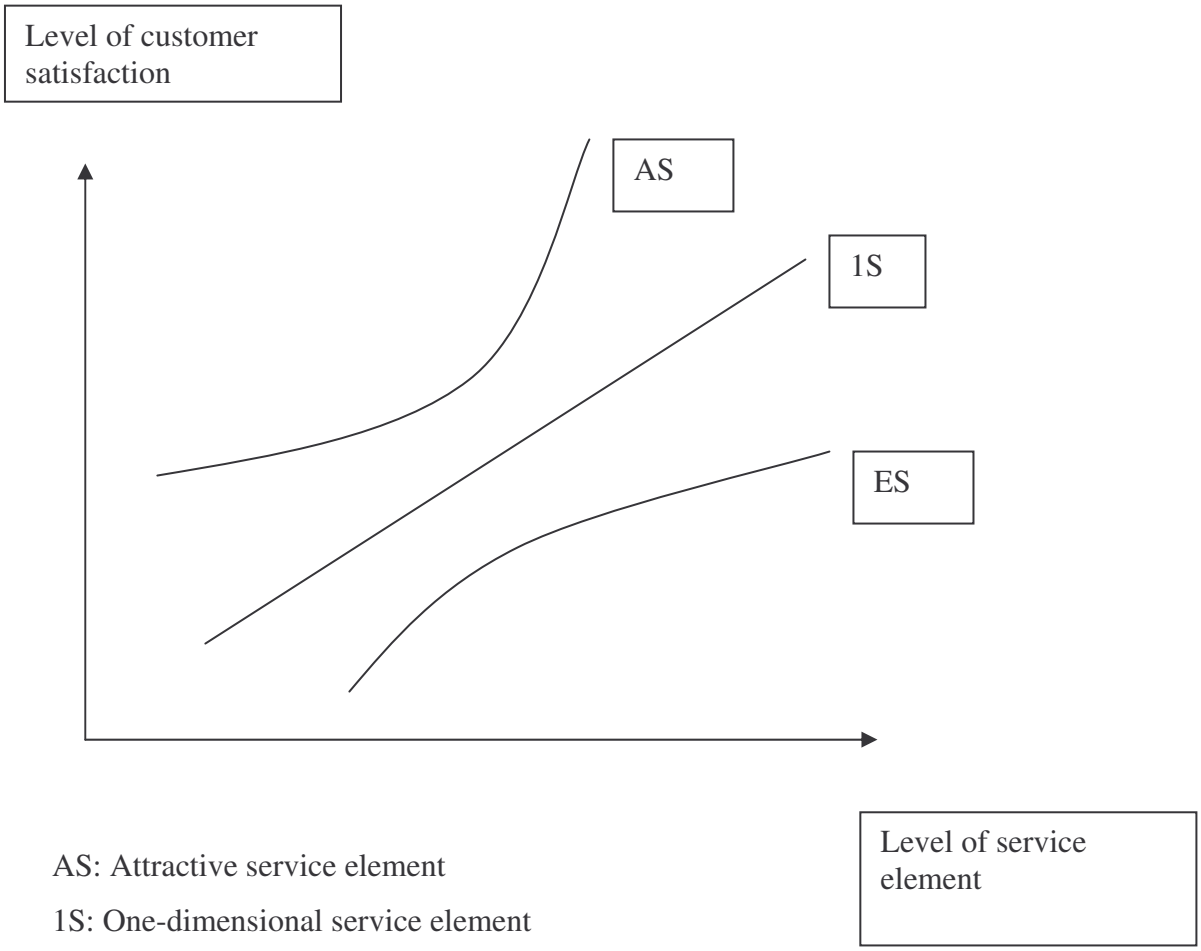
In fierce competition the importance of information cannot be overemphasised, since they are the basis of effective use of resources. In our case the question is how to correlate the quality offered and the requirements. More precisely, the quality level should not be „unreasonably" high, which case means unnecessary costs, and on he other hand in case of under estimating the requirement customers will be lost.

For the sake of simplicity let's assume that the segment of CEP were determined so that they serve more or less homogenous customer group (by main features of demand). The parameters listed above have different meaning for each customer group (e.g. lead time can be different; reliability can mean extra consignment insurance or notification of delivery as well.) The actual meaning and value of parameter are the elements of quality. Thus the same quality parameter has different meaning for each CEP segment.
The target is not to offer a "general/common" quality for all customers. The products must be "equipped with" the specially required quality elements produced with the same technology but of satisfaction can be archived.

8. Kano's model

The quality of a service can be classified into different groups by the expression of requirements and by the actual satisfaction generated by the performed level of quality (Kano, 1985**,** Huiskonen, Pirttila 1998). Service providers have to plan the quality elements. For this reason they have to learn the customer's expectations and the quality levels experienced by the users and also the appropriate procedures gave to be planned including the development possibilities and their costs.
Noriaki Kano (Japanese professor of quality management) has created the theory of quality elements classification. The service elements fall into three different categories that have different effects on customer satisfaction or dissatisfaction (see Figure 3).

Figure 3. Kano's service elements classification



AS: Attractive service element

1S: One-dimensional service element

ES: Expected service element

8.1. Kano's categories

Expected service elements

The expected service elements are those what customers expect as a self-evident parts of the service offered. The expected elements does not create actual satisfaction they remain unnoticed, nevertheless the lack of them create great dissatisfaction. The right levels of these elements have to be determined, because too low levels generate dissatisfaction, "too-high" level means unnecessary costs.

In customers surveys the expected elements are not well represented (often not expressed at all) so careful considerations have to be done.

One dimensional service elements

The effects of these elements on the customer satisfaction are more or less “linear”. The customers consider these elements as key factors, the evaluation of service is based on them. The higher quality of these elements is the higher satisfaction of customers.

Attractive service elements

The attractive service elements often exceed the customer expectation, most of them represent latent needs. The majority of customers do not consider them as a quality factor, so lack of them does not generate dissatisfaction, However, offering them to the customer create great satisfaction and they are considered very useful. It is a good way to identify a given service of a company.

It must be emphasised these elements are gradually shifting to the one-dimensional and after a while to the expected category.

9. Conclusion

Basic quality expectations of CEP services well known by now (main by providers). On the other hand the different levels and categories are not explored. The Kano’s categories, that can improve competitive advantages by using relative little resources to generate great customer satisfaction, are not determined in the CEP sector. The different segments gave different quality structure and quality levels have to be fit to them. Company processes and procedures gave key role in establishing the right structure. The outputs of processes gave to be planned and designed (regardless of the actual organizational structure of the company), so the material and immaterial resources can be concentrated on the field that can result the highest customer satisfaction. Instead of simply scaling the importance of elements the classification and categorisation of them will be beneficial. Kano’s model can support the establishment of categories. In practice the latent and expressed requirements of existing customers can be learnt more precisely and new customers can be accessed as well.

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