

EFFECTS OF SERVICE INDUSTRY ON PERCEIVED QUALITY

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Among the many elements which affect a customer's acceptance of a foreign over domestic product, "perceived quality" has lately been receiving much coverage by the media and industry.

Since service industries directly interface with customers, they can and do impact on the overall perception of the product quality¹. According to Dr. W. Edwards Deming in dedication of 50th anniversary commemorative reissue of Dr. W. A. Shewhart's book², "the quality of any product is interaction between the product, the user, his expectations, and the service that he can get in case the product fails or requires maintenance."

This paper explores the influence of service industries on perceived quality. The indexes that measure consumer satisfaction with respect to product service and those that can lead to corresponding preventive and/or corrective actions are discussed.

SERVICE INDUSTRY INFLUENCE ON PERCEIVED QUALITY

When a consumer waits for his product to be serviced, his own productivity, productivity of his employer and productivity of nation as a whole suffers³. Businesses should be interested in learning these effects since these may have a strong influence on consumer buying decisions. Further, service time and costs also affect the consumer satisfaction levels. A consumer is not necessarily dissatisfied because his product broke down, but he is definitely dissatisfied if a product broke unexpectedly and it did not return to normal operation within expected time at expected cost. One does not need extensive consumer survey data to justify this premise. Further contribution to his dissatisfaction is due to the lack of courtesy in dealing with the service organization and/or repeated visits to solve a single complaint. He perceives occurrence of excessive and unpredictable maintenance costs, unexpectedly lengthy delays, lack of courtesy expressed by service personnel and repeated visits resulting from "poor quality" product. This affects his future buying decisions.

Some U.S. businesses have detached service organizations and made them independent. For example, automotive dealerships which are independent from automotive companies sell the maintenance services. Some U.S. companies exercise various degree of controls on the services they sell. On one extreme, some products are sold only with the service contracts such as computers, copying machines, etc., whereas on other extreme, independent service organizations handle the consumer needs. In either case, consumers feel that the company can exercise some control over the quality of service. In the case where service organization is completely detached from the company, the opportunity to learn customer's reactions first hand is lost. Not only that company may loose some customers due to third party mishandling of the service situations. The companies, in trying to correct a loss of market share, may apply the wrong corrective measures if they ignore the effect of service industries on consumers and thereby misdirect their important limited resources.

QUANTIFICATION OF SERVICE INDUSTRY INFLUENCE ON PERCEIVED QUALITY

There are many mathematical models studied to determine the factors that affect consumer satisfaction level. Many times this knowledge is not converted into useful product or service characteristics due to decision making processes that are inclined to use business methods rather than existing technological improvements to maintain the market share. For example, use of a continual change in a product mix, a frequently applied business method, is believed to attract and satisfy consumers without inherently changing the product design and/or service philosophy. In large part, this belief is nurtured if every company in the same product manufacturing business uses the same tactics. However, if new competition enters the market with different product design and/or service philosophy, consistent with the consumer satisfaction model, the existing companies are likely to suffer the significant loss of the market share. This is evidenced by a recent decline in the U.S. share of the automotive market, whereas Germans and Japanese auto manufacturers are clearly gaining with comparatively less variety in their product models. What is it that the foreign manufacturers understand about consumers that the U.S. manufacturers don't? In an effort to explain this, the authors postulate the consumer satisfaction model as follows:

$$\text{Consumer Satisfaction Level} = S \times \left[\frac{E \left(\frac{R}{R + M} + Q \right)}{EX} \right]$$

where

- S = Integrity of Service Organization
- E = Efficiency of the Product
- R = Reliability of the Product
- M = Maintainability of the Product
- Q = Manufactured Quality of the Product
- EX = Level of Consumer Expectation

Of course, there are other allied factors that affect consumer satisfaction level that are not included in the postulated model, since they are associative in nature and they are not influenced by the product service considerations. For example, a level of luxury, a level of safety, a level of maneuverability, number of accessories, an operational convenience, etc.

Simplified explanation of each factor in the postulated model is given below.

Efficiency - Cost of operating a product; for example, miles per gallon in an automobile is a measure of efficiency

Reliability - How often product function needs maintenance and with what degree of advanced warning

Maintainability - How quickly and at what cost a failed product is brought back to normal operation

Manufactured Quality - How often product function prematurely breaks down and/or how quickly product appearance degrades

Expectations - What does consumer expect from a manufactured product

Integrity of Service Organization - How cordially is consumer treated at service center, how competently and honestly functional failure complaint is handled, how much time delay is caused, etc.

All the factors included in the postulated model are directly or indirectly related to service industry and can be quantified, at least subjectively. One can rate each factor on 1-10 scale, assigning 1 and 10 to two possible extremes. Such scheme is exemplified in Table 1.

Table 1
Influence of Service Considerations
on
Perceived Quality

	Factors	Symbol	Rating Scheme	
1	Consumer opinion about service experience	S	1 - very poor	10 - very good
2	Consumer opinion about frequency of design failures and advance warning features	R	1 - very poor	10 - very good
3	Consumer opinion about degree of convenience in restoring a failed product function	M	1 - very good	10 - very poor
4	Consumer opinion about premature failures in product function and/or appearance	Q	1 - very poor	10 - very good
5	Consumer opinion about efficiency	E	1 - very poor	10 - very good
6	Consumer opinion about his expectations	EX	1 - very low	10 - very high

Example 1 - All opinions are "very good"

Consumer satisfaction level = 191

Example 2 - All opinions are "very poor"

Consumer satisfaction level = 0.109

Example 3 - All opinions are in middle (rating of 5)

Consumer satisfaction level = 7.5

Example 4 - All opinions are "very good" except opinion about service organization is "very poor"

Consumer satisfaction level = 19

Example 5 - All opinions are "very good" except opinions about service organization and maintainability are "very poor"

Consumer satisfaction level = 15

Example 6 - All opinions are "very good" except opinion about maintainability is "very poor"

Consumer satisfaction level = 150

Example 7 - All opinions are "very good" except opinions about manufactured quality is "very poor"

Consumer satisfaction level = 101

Example 8 - All opinions are "very good" except opinions about the efficiency is "very poor"

Consumer satisfaction level = 109

Based on the results of such quantification, one can generate short term corrective or long term preventive actions that are necessary to raise the level of perceived quality. Based on the above examples, one can see that the service considerations play a major role in affecting the consumer satisfaction level.

CONTROL OF FACTORS THAT ARE RELATED TO SERVICE INDUSTRY

There are three distinct partitions in the postulated model that are discussed with respect to their relation with service industry, namely, (1) Expectations (EX), (2) Integrity of service organization (S), and (3) A measure of frequency with which service needs arise, i.e. $E \left[\frac{R}{R + M} + Q \right]$

(1) Expectations (EX) -

Consumer expectations are, in large part, built through advertising media and/or visible competitive product performance. Large corporations do not effectively utilize the media advertising to build the realistic expectations about their products. They stress product and/or service performance pictorially with fine print cautions or altogether avoid depicting the operational realities. Such efforts may be successful in making a first sale, but perhaps quite harmful in a long run for repeated sales particularly when a consumer is in position of comparing his own experience with that of advertising content. Foreign competition can really be damaging in this regard, not necessarily because it is better but because it simply provides another option to consumer.

What Can Be Done

1. Advertise operational realities to build expectations.
2. Do not advertise service features of the product and/or integrity of service organizations when they are not directly under manufacturer's control.
3. Recognize the limitations of advertising when the competing product is visibly superior.

(2) Integrity of Service Organizations (S) -

This is a key partition in the postulated consumer satisfaction model. It can nullify the favorable effects produced by the other two partitions in the model. One can hardly argue against the need for courteous treatment in maintaining the quality image of the product. In this regard, service organizations leave much to be desired. Neither do they utilize principles developed in the field of human behavior nor do they use speedy consumer complaint handling methods developed by industrial engineers. A competing product can really gain consumer

acceptance if for such a product the number of visits to service organizations are proportionately smaller and/or "speed and courtesy" are demonstrated during consumer visits.

Another aspect of service organization is the demonstration of competence and honesty. That is, an ability of service organization to handle the consumer complaints knowledgeably in optimum number of visits. Many service organizations handle the consumer repair requests by replacement of parts rather than correct diagnosis. This may require several visits and many unnecessary replacements before a complaint is finally resolved.

What Can Be Done

1. Product manufacturers must seek better way of organizing service business which is sensitive to consumer needs and his perception of quality.
2. Servicing organization considerations must be part of business analysis strategy, and it should not be left to the imagination of independent service organizations.

(3) A Measure of Frequency With Which Service Needs Arise

$$\left[E \left(\frac{R}{R + M} + Q \right) \right] -$$

This partition is definitely under the control of manufacturing organization. If unattended or improperly understood, it can increase the frequency of consumer service needs. Wherever the U.S. has lost a significant market share or has allowed the consumer to consider another option, this factor has played an important role.

Efficiency factor in this partition can create a service need if it does not meet the expected performance. For example, if consumer expects 30 miles per gallon from his automobile and gets 23 miles per gallon, this is likely to create a service need.

Reliability is yet another factor in this partition that can create a service need. There are two aspects of this. First, reliability refers to the frequency with which product function fails. Higher reliability means less frequent visits to service organization. Second, reliability refers to the degree of predictability of product function failure. Low predictability would mean, no advance warning before failure. As a result, the need for service organization may arise in much awkward circumstances.

Maintainability is a balancing factor for reliability and refers to the quickness with which a failed product function can be restored. Higher maintainability would minimize the need to visit service organizations, since the repair needs can be handled by consumers themselves. On the other hand, lower maintainability means a need for an expert help and possibly longer delays at service shops.

Combination of efficiency, reliability and maintainability constitute that portion of the consumer satisfaction model which is in direct control of design engineers. Preceding discussion elaborated as to how design considerations can influence the frequency of service needs.

Yet another important factor in this partition is a level of "manufactured quality." This refers to the degree to which premature failures occur on the product or degree to which premature degradation in appearance of the product occurs. In either case, a service need arises.

What Can Be Done

1. Manufacturers can reduce the need to visit service centers through integral design and manufacturing systems that utilize principles of quality.
2. As much as possible, maintainability in design should include "handyman" considerations.

SUMMARY

Product service is very much a part of productivity and consumer satisfaction issues that require closer examination by the product manufacturers and the nation as a whole. Time spent in servicing a product does not contribute to the productivity increase, on the contrary, a poor servicing job downgrades the productivity indexes severely. Overall question is, how to minimize service needs by using state-of-art design and production technology and how to treat consumers right when such needs do arise. Of course, common denominator to any such efforts is consumer expectations. How to keep the level of such expectations realistic by proper use of the advertising media and to modify product performance to match or exceed the visible competitive product performance, are the challenging elements involved.

The authors have postulated and exemplified the consumer satisfaction model that can allow a determination of service industry influence on perceived quality by conducting consumer opinion surveys. Results of such a survey can be useful in channeling the important resources toward product and/or service improvements.

REFERENCES

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