'PERCEIVED QUALITY'

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The primary goal of American industries is to make a profit through customer acceptance of their products and/or supporting services. Recently though, customer regard for American products over imported goods has eroded. To rationalize this change the media has focused on the apparent differences in 'perceived quality' between industry and consumer.

What is 'perceived quality' and its relation to 'actual quality'? What is its effect on customer satisfaction? Who should be concerned about 'perceived quality'- - -the quality staff, marketing staff, or other service groups?

This paper explores the nature, components, and solutions to the 'perceived quality' phenomena. The application of measurement methods and the utilization of significant relationships involved in quality perceptions are also discussed.

'PERCEIVED QUALITY'

In attempting to define 'perceived quality' one finds that perception of stimuli is limited by both physical abilities and social/psychological factors. This results in an event or object being described differently based upon individual interpretations of 'reality.'

'Quality' is also a concept open to subjective interpretation. Traditionally, it has been described as 'fitness for use.' But the question of intended 'use' and its associated fitness still can be obscure when determining product intent.

For the purpose of discussion we will define *'PERCEIVED QUALITY'* as *a subjective measure of a product or service based upon an internalized notion of an 'ideal.'*

PERCEIVED QUALITY - INFLUENCES

By definition perceived quality is highly susceptible to many forms of outside stimuli. If one were to categorize these influences they would find four primary types of stimuli that tend to result in altered quality perceptions.

EXPERIENCE - objective forms of observation or participation in events that alter perceptual skill and allow focusing on individual product elements/services for evaluation. Forms of experience include:

- training (perceptual sensitivity)
- 'like' product exposure (reliability, maintainability, service, etc.)
- wide range of product exposure (work experiences, social interchanges)
- functional use/misuse

This characteristic is most sensitive to changes in 'actual' quality level. Consumers are generally most influenced by their experiences when determining product/service quality.

ASSOCIATIONS - the process of forming mental connections or bonds between sensations, ideas, or memories. Examples:

- all forms of perceptual ties (e.g. smell to taste)
- functional effort and quality
- complexity and sophisticated engineering
- brand name and cost/quality

For illustration purposes associations will be displayed by a dotted line

impolite attitude - - - - - - - - -► general lack of concern

or impolite attitude 'is associated with' a general lack of concern.

LINKS - the transference of 'associated' characteristics among product/services that can be connected via structural or relational bonds.

Including:

- service to parent company
- product cost to product/service

Links will be symbollically described by a solid line

service manager ————————► service center

(is linked to)

Multidirectional links or associations will be indicated by a double arrow (◄——► or ◄- - -►)

(is linked to)

company policy ◄————————► product

and

product (is linked to) company policy

DISTORTIONS - the twisting of information in directions that tend to misrepresent products or services. Distortions can be negative as well as positive and commonly occur in:

- advertising
- media
- social interactions and exchanges.

Cases where an element has been distorted will be encircled to indicate sources of misinformation.

(manufacturer) i.e. relevant information about the manufacturer has been distorted e.g. recall of 800 products; failed to mention represents .000001% of product output)

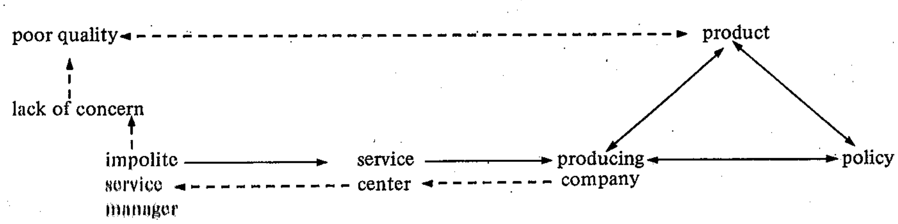
EXAMPLES:

1. (manufacturer) - - - - - - - - - - -► poor quality product ————————————► all products

In the recall situation described above the distortions created by media coverage have generated the assumption that;

'all products made by the manufacturer are of poor quality'.

2.



This sequence describes the result of an impolite service manager whose attitude becomes linked and associated with product quality. In this situation the belief is created that poor quality products are made and promoted by the producing company. These conclusions are especially 'onerous' when the assumed links do not actually exist (i.e. producing company does not 'control' service center).

Needless to say, 'experience' is usually the predominant influence in determining product/service quality evaluation. The relatively objective influence of experiences on product/service quality is a large contributor to loss of sales as well as repeat buying. If 'actual' quality is poor, little can be done to positively alter public opinion over large time frames, short of changing the product or process.

In cases where perceived quality is lower than 'actual' quality then distortions, associations, and links can be utilized as potential gains to positive quality perception.

UTILITY THEORY

Now that we have defined and developed a system for describing perceived quality and its associated stimuli (links, associations, etc.) it would be beneficial to establish a means of measuring (describing) levels of quality perception. Fortunately, one can draw upon the experiences of economists' in dealing with similar subjective situations.

Preference/indifference curves have been utilized to establish quantitative relationships among commodoties. These relationships have taken qualitative opinions and have resulted in a series of isoutility curves that approximate rational consumer preferences.

The term *utility may be used to describe that property in any object whereby it tends to produce benefit, advantage, pleasure, good or happiness.* For example one might wish to establish equal trade-offs between the pleasure associated with smoking and the equivalent risk of cancer. (Figure 1)

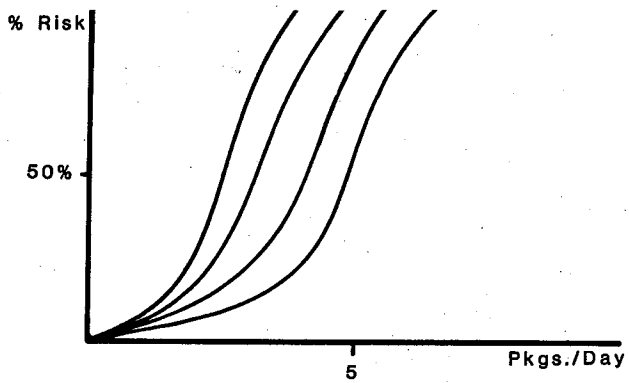


Figure 1

This system of indifference curves establish utilities associated with smoking. Where
.5 pkg./day is equivalent to 10% risk or
1.0 pkg./day is equivalent to 20% risk or
⋮ ⋮
2.5 pkg./day is equivalent to 50% risk or etc.

Likewise, cost trade-offs can be used to establish preference curves (Figure 2).

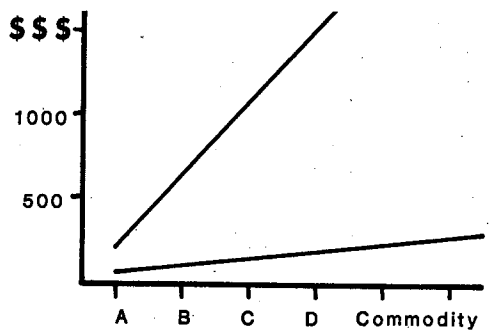


Figure 2

Where A item at \$200
B item at \$650
C item at \$1050
D item at \$1500

and

A item at \$ 50
B item at \$100
C item at \$150
D item at \$170

form two systems of equivalence classes.

Parallel lines (curves) indicate similar systems.

PERCEIVED QUALITY AND UTILITY THEORY

For our application utility theory will be used to establish:

- the utility of perceived quality as viewed by consumer
- the utility of perceived quality as viewed by manufacturer
- the significant relationship derived from consumer/manufacturer comparisons with regard to the utility of quality.

In this context we will assume that perceived quality is a commodity and thus has utility associated with it. These utilities may be used to establish preference/indifference curves with regard to other commodities.

Consumer Expectations

As was pointed out earlier perceived quality is highly susceptible to outside stimuli. In this regard consumer behavior tends to be unstable and 'opinion sensitive'. Part of this situation is related to the information regarding product/service that is available. Objective information generally comes from prior product/service exposure and typically this is confounded by the links, distortions, and associations that have been established.

In spite of these circumstances, the use of preference curves allows desired quality to be compared to other commodities. (Figure 3)

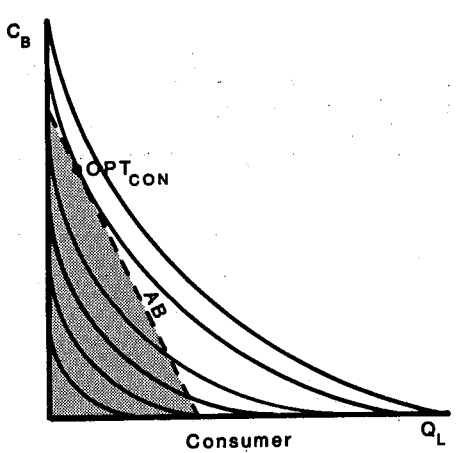


Figure 3

Let C_B be any commodity or product characteristic that can be 'traded' for quality (Q_L). Then the above system of isoutility curves form a measurable means of establishing the value of quality to the consumer. When a budget line ($\overline{AB}$) is introduced, the consumer is restrained by the total financial costs of quality and C_B. The shaded area under $\overline{AB}$ then represents rational choices with regard to the consumer budget and preferences. It is generally assumed that the greater quantity of any commodity is always preferred. Using this assumption an optimal point of customer expectations (OPT_{Con}) may be calculated. This utility point is used to define consumer satisfaction with regard to quality (Q_L), C_B, and budget (i.e. Consumer Satisfaction = OPT_{Con}).

Manufacturer Decisions

Unlike the consumer, manufacturing decisions regarding products exhibit more stable characteristics, dictated by 'fixed' product definition (intent and 'fitness for use'). Product information is also readily available in consumer surveys, field and warranty reports, etc. and thus tends to be more objective.

In determining the utility of quality, the manufacturer is influenced by business operating restraints along with the anticipation of consumer expectations. Thus a combination of several preference curves (Figure 4) may affect the total manufacturing decision (Fig. 5).

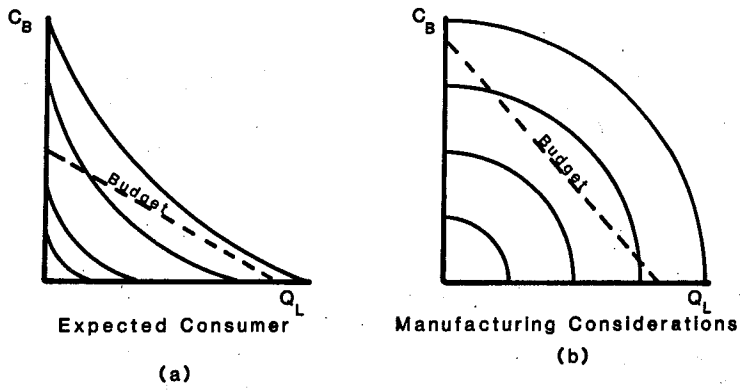


Figure 4

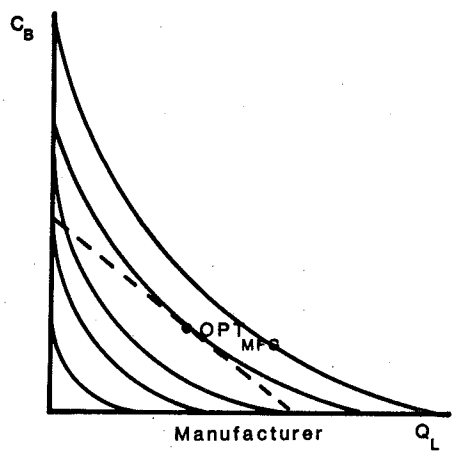


Figure 5

These isoutility curves (Figure 5) represent the combination of manufacturing and consumer considerations, where consumer expectations are always assumed to be satisfied.

As in the consumer curves (Figure 3) an optimal solution within budget exists (OPT_{Mfg}). OPT_{Mfg} represents a manufacturing strategy for achieving both consumer satisfaction and profit. Though sought after, OPT_{Mfg} is not always achieved and actual performance ($PERF_{Mfg}$) must be considered.

CONSUMER-MANUFACTURING - QUALITY RELATIONSHIPS

In order to understand the perceived quality 'phenomena' it is necessary to examine the derived two optimal utility points (Figure 3,5). The following algebraic relationships are defined as:

CONSUMER	MANUFACTURER
Consumer Satisfaction (CS) = OPT_{Con}	Strategy (MS) = OPT_{Mfg}
	Actual Performance (MP) = $PERF_{Mfg}$
Perceived Quality Rating (PQR_{Con}) = $\frac{(MP)^T}{CS}$	Translated Performance $(MP)^T$ = the manufacturing utility translated to the space of the consumer (i.e. best fit curve on consumer plot Figure 3).
	Perceived Quality Rating (PQR_{Mfg}) = $\frac{MP}{MS}$

Thus perceived quality can be incompatible since

$PQR_{Con} = \frac{MP^T}{CS}$ is not necessarily equal to $\frac{MP}{MS} = PQR_{Mfg}$

As illustrated consumers can be completely satisfied (i.e. $MP^T = CS$) while the manufacturer feels there is still more to be done; likewise a manufacturer cannot understand why the consumer is discontented when MP =MS.

The optimal solution occurs when $PQR_{Con}=PQR_{Mfg}=1$.

ADJUSTMENTS TO ACHIEVE 'PERCEIVED QUALITY' AND CONSUMER SATISFACTION GAINS

The consumer and manufacturer utility functions provide a valuable tool for evaluating consumer reactions. These relationships describe situations based on the following guidelines:

1. In order to meet minimum requirement MP^T must fall within the shaded area under the budget line $\overline{AB}$ (Figure 3) i.e. product cost must not exceed consumer budget.
2. When $PQR_{Con} > PQR_{Mfg}$ then improper evaluation of consumer expectations has occurred; i.e. the consumer is 'more pleased' then expected
3. When $PQR_{Con} < PQR_{Mfg}$ then consumer expectations have not been met.

   Check for:

   - improper quality to commodity ratio
   - poor budgeting considerations

4. When $PQR_{Con} = PQR_{Mfg}$ then proper evaluation as to consumer expectations may have taken place, optimal condition exists when $PQR_{Con} = PQR_{Mfg} = 1$ and CS = MS.

RECOMMENDATIONS FOR FURTHER EVALUATION

The simplicity of the above situation rests in the fact that quality level is being compared to one commodity (even if collective). In reality the most information can be derived when individual product elements are compared to quality level (e.g. cost to quality, functional quality to appearance quality etc.)

This cardinal additive approach would assign weights to individual elements based on philosphy, cost, consumer preference, etc. Using this concept individual utility functions could be used to evaluate deficiencies or 'over extended' areas in the product/service.

Deficiencies could be handled by

- new costing approaches
- utilizing perception stimuli (links, associations, etc) to increase/decrease utility values assigned
- better consumer feedback and reaction to it
- better actual performance levels by manufacturer

Over-extended areas should be reduced by

- less expenditures for increased perception stimuli
- greater awareness of consumer value criteria

The approach described here would then define the PQR by summing individual elements of 'actual' utility and 'desired' utility and comparing the ratio of 'actual' to desired.'

To properly sum the individual results so that they are realistic, weighting of factors is applied. The use of weights allows individual components to display the relative importance of each component to the consumer as compared to the others. Weights may be assigned using cost, priority, philosophy, etc. as a basis.

CONCLUSION

The use of utility functions has led to a more clearly defined and measurable notion of perceived quality and consumer satisfaction. This paper has introduced this notion as a generalized tool for quality evaluations.

Further studies must be made to explore compound cases where interactions within factors occur, if the maximum information is to be derived.

It is apparent that any quality system must involve all areas of a company in creating quality and its associated image. This involement will recognize how the links, associations, distortions, and experience along with the actual manufacturing product quality will contribute to the resolution of the perceived quality phenomena.

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