

Measurement of Customer Satisfaction

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Abstract : In order that new materials, new processes, new technologies and new products developed by R & D organizations, it is essential that these outputs of R & D efforts find good markets and are backed up by necessary support services. While basic or fundamental research can not necessarily be customer-focussed, R & D activities carried out in R & D organizations have to result in deliverables which satisfy their potential customers or sponsors. Measuring customer satisfaction becomes quite important in this context. The present paper discusses associated problems, outlines the ACSI model for measurement of customer satisfaction, linking the latter with its determinants and consequences, and points out modifications in the way some latent variables in the model should be operationalised.

Keywords : *Customer expectation, Customer loyalty, Customer satisfaction, Latent variable, Partial least squares, Perceived value.*

INTRODUCTION

Customer occupy the center-stage of Business and Industry today. Customers present a wide away of interests and preferences, requirements and expectations, purchasing powers and demand profiles. In the current globalised and liberalized market economy, understanding customers' requirements and fulfilling these requirements followed by an assessment of customer satisfaction are the key functions in any business or industry, which has to stay and grow in a world where Quality has come to be recognized as an International Language.

The same is true even for R & D Institutions which develop and market new materials, new processes and new technologies.

Of course, the profile of customers and their needs and expectations are different from those in the case of manufacturers of goods and providers of services. For example, a potential buyer of a new technology may need to be assured of a modest investment for an easy adoption, a short payback period, a high return on value addition (through the new technology), and a long life - cycle.

Measurement of customer satisfaction has been attempted in various ways by different groups, primarily based on responses in a properly designed (sample) survey of customers or potential customers seeking their opinions or ratings of features and functions of a supplier that beget customer satisfaction or otherwise. These responses to various items in a questionnaire are scaled and their weighted average is accepted as a Customer Satisfaction Index (CSI). Lots of variation remained in identification of the group to be surveyed, in sampling, in questionnaire design and administration, in scaling, in assignment of weights, etc.

Of late some national standards to derive CSI from a comprehensive model that includes drivers and consequences of customer satisfaction have gained adequate recognition. One such model is the American Customer Satisfaction Index (ACSI) Model.

The present paper attempts to explain the broad methodology behind the ACSI model, with some elucidation necessary to adopt the model in the context of an R & D organization.

Measuring customer satisfaction

An important aspect of marketing (and of market research?) concerns.

UNDERSTANDING

Customer needs and expectations

And

MEASURING

Customer satisfaction.

Customer satisfaction, customer loyalty and business performance (company profitability) are casually connected (not just empirically correlated), but not uniquely.

While the third variable is rather measurable, the other two are really latent variables.

A pertinent question is - should customer satisfaction be measured in respect of a product, an augmented product, an extended product or the entire experience of a customer (user) in acquiring, using, maintaining and even disposing of the product? It should be noted that the word product is generic and does include outputs of R & D activities meant for external customers.

An answer to this question pre-supposes a differentiation among products, augmented products and extended products. For instance if we look upon a manufacturing technology developed in an R & D laboratory as a product, the augmented product includes the entire documentation needed to implement/adopt the technology in manufacturing practice as also to support it. The corresponding extended product will involve services of the laboratory in responding to requests, suggestions and complaints of users or customers.

No unique answer. The answer depends on the definition of customer satisfaction and the intended use of a customer satisfaction index CSI. One may, for example, argue that overall satisfaction is influenced by a user assessment of the degree to which a product's performance is perceived to have met or exceeded his or her desires (desires congruency) and expectations (expectations congruency).

Earlier approaches to measuring CSI were based on findings of market surveys eliciting responses from existing or potential customers/users about some identified features of a product/service and of related service. CSI can be taken as a weighted average of individual feature evaluations on a scale from 0 to 100, weights being the perceived importance measures of the different features. Such a measure can help a company in balancing its efforts to improve the different features, taking care of costs.

The ASCI MODEL

Swedish Customer Satisfaction Barometer (SCSB) was the first national cross-industry instrument (1989), which was adapted and adopted for use in ACSI and followed by the ECSI.

The American Customer Satisfaction Index (ACSI) is the only uniform, national, cross-industry measure of satisfaction with the quality of goods and services available in the United States. Established in 1994, the ACSI is both a *trend measure* and a bench mark for companies, industries, and sectors of the household consumer economy. Research that makes use of the database from the first four years of the ACSI shows that this index is predictive of both companies' financial returns and national economic performance.

Consistent with its definition, satisfaction is measured as a latent variable (construct) using multiple indicators (questions). Any one concrete measure of satisfaction, such as a single survey question rating, is at best a proxy for latent satisfaction (Simon, 1974). Instead, the ACSI uses a variety of proxies or benchmarks that customers use to evaluate their overall consumption experience. These proxies are combined into an index to operationalize satisfaction as a latent construct.

The ACSI uses an econometric model with measures of satisfaction and related constructs that are general enough to be comparable across firms, industries, and sectors. These measures come from survey questions that are inputs to the model. The relationships in the model, and the variable measures used to estimate these relationships, apply to public services and competitive product markets alike.

The basic ECSI Model, based on the

Requirements of Comparability,
Reliability and
Robustness and
Structural Modelling approach,

Links customer satisfaction with its determinants and, in turn, to its consequence namely customer loyalty.

The determinants of customer satisfaction are :

- Perceived company image,
- Customer expectations,
- Perceived quality and perceived value.

Perceived quality includes two elements viz. 'hard ware' and 'human/soft ware'.

Each of these seven latent variables is operationalised by 2 to 6 indicator or measurement variables. Customer satisfaction is measured in terms of responses to the 3 questions:

1. 'Considering all your experience of organization X, how satisfied are you, in general?' on a scale from 'completely dissatisfied' to 'completely satisfied'.
2. 'To what degree id organization X fulfill your expectations?' on a scale from 'much less than expected' to 'much more than expected'.
3. 'Imagine an organization which is perfect in all respects. How close to this ideal do you consider the organization X to be?' A CSI is calculated as a weighted average of scores from the three questions.

Customer Loyalty is operationalised by four indicators viz. The customer's intention to :

- re- purchase,
- cross-buy
- switch to a competitor(price tolerance),
- recommend the brand/Co. to other customers.

The entire model is estimated using partial least squares, that assigns weights to the survey measures such that the resulting model has maximum explanatory power i.e. maximum prediction accuracy for the ultimate dependent variable viz. customer loyalty.

PLS is shown to deal with

- Multi-collinearity,
- Manifest skewness and

Mis-specification of inner and other structures in a reasonably robust way.

Alternative methods like ANN and GME have also been used to estimate the ECSI model.

Imputation methods can be tried out. The basic problem is that we do not have observations on the latent variables.

All the seven latent variables are transformed from original 1-10 point survey measures to 0-100 point scales. Some scale these have unit variance.

Regression Analysis shows a significant linear relation between customer satisfaction and customer loyalty (retention). However, one may note that loyalty may be increased by one of the two strategies viz. increased customer satisfaction by branding and similar activities, increasing costs thereby or being price efficient, thus reducing revenues. Incidentally, some studies have reported negative relationship between customer satisfaction and market share, possibly suggesting that it is more difficult to satisfy a larger customer base, often comprising many dissimilar segments.

PROBLEMS WITH R & D ORGANIZATIONS

In the case of an R & D institution engaged in developing and offering (to institutional customers) new materials or technologies or control systems or even new products, operationalisation of the latent variables in terms of some indicator variables (values whereof are to be obtained from responses to some questions/statements) has to proceed on lines somewhat different from the one adopted in the case of a manufacturing industry. In particular, customer loyalty should be comprehended in terms of a customer's (a) acquisition of another product/service offered by the R and D institution; (b) approach to the R & D institution for possible design and development of a new product/ service for the customer exclusively; (c) recommendation to others about product/services offered by the institution for a possible expansion of the latter's product/service profile.

CONCLUDING REMARKS

Measuring customer satisfaction in relation to R & D organiza-

tion demands a comprehensive and relevant operationalisation of the various concepts and constructs used in the ACSI or any similar model. The determinants of customer satisfaction or even of (customer-) perceived value of product/service (as one contributor to satisfaction), the set of questions to be asked about a determinant or a consequence, the weights to be assigned to different items etc. should be carefully designed to suit the characteristic requirements of an R & D organization.

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