Customer satisfaction: the need for multiple perspectives of information system quality

R.T. Vidgen, J.R.G. Wood & A.T. Wood-Harper
Department of Mathematics and Computer Science, University of Salford, M5 4WT, UK

Abstract

A central concern of quality is customer satisfaction and any effective quality management system must incorporate a procedure for assessing the level of customer satisfaction achieved. A collapsed down view of customer satisfaction made through a single perspective lacks the richness to address situations characterized by complexity and messiness. An objective approach to assessing customer satisfaction should be supplemented (not replaced) by perspectives that reflect softer aspects of quality. Multiple perspectives represent different knowledge interests and cannot be reduced to a common denominator - judgement must be exercised to decide the relative weighting to be given to each of the perspectives. A customer satisfaction framework has been developed based upon multiple perspectives: product, use, and service. Unless multiple perspectives are recognized quality management will continue to be ineffectual in complex situations.

1 Introduction

The stated purpose of quality management is the achievement of customer satisfaction, through the provision of products that satisfy 'stated or implied needs' [ISO 1986] and have 'fitness for purpose' [Juran 1979]. Quality management has been concerned particularly with process capability and with process and product metrics in an attempt to achieve consistency and, to a greater or lesser extent, an ex ante guarantee of customer satisfaction. However, although the supplier

may be able to control the form of the product (the software that forms part of an IT application), the use of that product is unpredictable. To manage quality suppliers must also attempt to assess regularly the actual level of customer satisfaction achieved. We argue that a single perspective on IS quality, such as an objective approach implemented through the use of quantitative metrics, will not be sufficiently rich to allow a meaningful and useful assessment of customer satisfaction to be made. Consequently, the use of multiple perspectives of customer satisfaction is proposed.

The structure of this paper is as follows: in section 2 the multiple perspective approach is described; in section 3 some results from interviews held with system development managers are given; a customer satisfaction framework based upon multiple perspectives is proposed in section 4; and, some of the implications of a multiple perspective approach to IS quality are outlined in the final section.

2   Multiple perspectives

The application of multiple perspectives to IS quality is not merely an exercise in looking at the same object from different angles or different peoples' perspectives (e.g., a customer view of quality compared with the supplier view of quality). Multiple perspectives entail different assumptions about what quality is (ontological) and how it is assessed (epistemological/methodological). The multiple perspective approach has been proposed for IS development in the Multiview method [Avison & Wood-Harper 1990, 1991; Wood-Harper & Avison 1992; Wood 1992], where the dimensions of organizational activity, information analysis, social-technical design, and technical design are proposed. These dimensions can be related to the perspectives of context (situation), decision-making, individual and group work, and technology respectively. Unbounded Systems Thinking (UST) [Mitroff & Linstone 1993] proposes three perspectives: organization, technology, and personal. The main argument of Mitroff & Linstone for adopting a multiple perspective approach is that no single perspective by itself will suffice to deal with complex and messy situations.

The multiple perspective approach is based upon complementarism, as contrasted with theoretical isolationism. In theoretical isolationism the rationality of one theory is the irrationality of another (theoretical incommensurability), but as all methodological rules must be consistent within a single and totalizing theory there is methodological commensurability. Theoretical isolationism implies a "scientific" approach to quality management. In complementarism it is recognized that there are different forms of knowledge and that these different

forms of knowledge are not reducible to a common denominator [Flood 1991]. Thus there is theoretical commensurability but methodological incommensurability. Theories are commensurable since they address different knowledge interests, but the methodologies are incommensurable as they are applied in different domains. Science is but one form of knowledge and scientific method may be the appropriate methodology; other forms of knowledge will need different methodological approaches.

However, by recognizing different forms of knowledge the multiple perspective approach is associated with practical difficulties, some of which are now considered. As a result of their background and tradition, people tend to privilege one particular perspective over other perspectives. For example, developers are often happier when taking a technological perspective of a situation. However, attempting to 'right' the situation by privileging the organizational view while at the same time marginalizing technological issues is not necessarily a solution. The perspectives represent different knowledge interests and thus need to be considered jointly. Because they cannot be reduced in any meaningful sense to a single perspective, there are no simple rules for balancing the requirements of different perspectives. Indeed, the perspectives should be expected to produce conflicting requirements and this dissensus used as a basis for discussion and action. Thus, in using multiple perspectives we need to be able to use methods that reflect the different knowledge interests, to be aware of the limitations of the different methods, and to use judgement to reach a balance.

In considering how multiple perspectives might be applied to IS quality empirical work is being undertaken involving interviews in system development and user areas of a large manufacturing organization. The interviews with system development managers lent considerable support to the need for a multiple perspective approach and had a significant impact on the choice of perspectives.

3 Interviews of system development managers

The first phase of the IS quality research project employed semi-structured qualitative interviews of three system development managers in a large manufacturing organization. These managers supply IT applications to support the technical design of products to be manufactured and each manager is responsible for around thirty development personnel. The IT applications provided include CAE (Computer Aided Engineering), document management, and traditional management information systems. The interviews were concerned with understanding what factors the system development managers thought

would be important to their customers. These interviews are being followed up with studies of specific IT applications from a user perspective, applying a use quality approach outlined in [Vidgen et al 1993]. One of the aims of the research is to understand how reasonable are the assumptions that systems developers make about customer satisfaction.

From the interviews key themes were extracted and the customer satisfaction framework developed further. Issues were raised concerning the development process, the quality of the resources, and the way in which the users operated the system. Cultural issues were raised that indicated political factors can have a significant impact on perceptions of quality.

A significant finding was the emphasis that development managers place upon the quality of the relationship with their customers. For example:

"good quality systems are characterized 100% by good relationships with customers" (and conversely);

"quality is lost through a lack of emphasis on customer service";

"product quality is almost irrelevant unless there is good service quality".

Other issues reported that system development managers thought might lead to customer dissatisfaction included: a failure to manage customer expectations; differences in the perception of a situation by users and developers (e.g., users categorize a change request as an error, developers categorize the same request as an enhancement); experience of the development process colours the user' perception of quality in use.

Service quality was seen to be of considerable importance by the system development managers. The need to improve service quality may be partly explained by the growing use of third party software (in one development area third party software made up more than 70% of all development activity). Much development work is concerned with assisting user areas to select a package and then to modify that package to meet their particular working practices. The role of the developer is often that of bricoleur (tinkerer) rather than the creator of monumental software edifices.   In such situations, service quality becomes particularly important.   However, whilst the system development managers may be aware of the need for service quality, it is quite possible that the system developers continue to work within a technological perspective, placing an undue emphasis on product quality.

Following these interviews a customer satisfaction framework was developed, in which product, use, and service views of quality were proposed.

4   A customer satisfaction framework

The product and use views of quality had been proposed prior to undertaking any interviews [Vidgen et al 1993]. The interviews of system development managers lead to a third perspective being included, namely service quality. These three views provide a working basis for a multiple perspective approach to IS quality, reflecting the product, the product in use, and the service provided by the supplier of the product.

The **product** view is concerned with as far as possible a context-free view of an IT application. Generic assessments of quality are applicable, such as reliability, usability, maintainability, etc. The product view is concerned with the external form of an IT application, considered independently of the context in which it is used. This is the 'Rolls-Royce' aspect of quality where we can appreciate the engineering excellence and the finish of the bodywork. Although the developer of the IT application can take a deeper view of the product, such as the cyclometric complexity of the various program modules [McCabe 1976], the IT application user does not typically see these deep aspects of the product and will be more concerned with the superficial aspects (e.g., do the boxes on the user interface have shading?). However, product quality does not guarantee IS quality. Feigenbaum defines quality thus (our emphasis):

> the total composite product or service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service in use *will meet the expectation of the customer.* [Feigenbaum 1983]

The **use** view of quality is concerned with the context in which an IT application is used. To understand the context of use we need to understand the purposeful activity which the IT application is intended to support. However, use context is uncontrollable and often unpredictable; unless system developers consider how IT applications are used in practice it is unlikely that they will supply quality products. The use context allows us to see where the product does not fit well with the working practices (purposeful activity) of the user. There are two aspects of use quality that can be distinguished - introduction and ongoing use. Introduction relates to the introduction of the IT application into the organization and the concern is the ease of transition (how much unplanned disturbance was caused by the

introduction of the IT application). The introduction aspect of use quality may occur at a specific point in time, but a bad experience at this stage may have implications for the perception of ongoing use quality. Depending upon the development method used and the approach taken the introduction and ongoing use aspects may be more, or less, blurred. Where an evolutionary approach to development using prototyping is adopted, the introduction aspect of use quality may be less clearly identifiable.
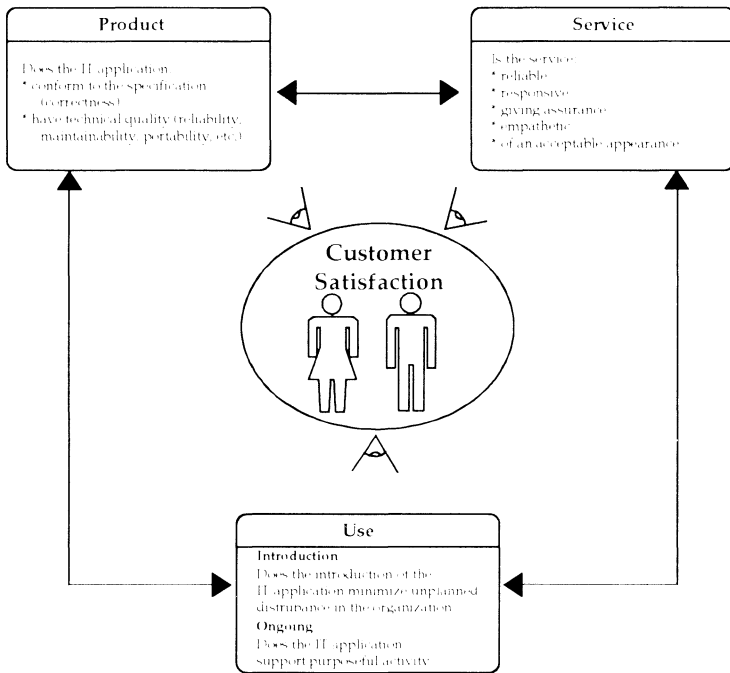

Figure 1: *Customer satisfaction framework*

The **service** view of IS quality is concerned with the customers' perception of the service provided by the development organization. The following overview of service quality is taken from [Zeithaml et al 1990]. Service quality is not about conformance to specification. Service can be seen to differ from product quality in three ways: firstly, service is intangible (the product is a performance); secondly, services are heterogeneous (they vary from supplier to supplier, customer to customer); and thirdly, many services are inseparable (quality of service occurs during service delivery). Service quality, as perceived by customers, can be defined as the extent of discrepancy between customers' expectations or desires and their perceptions. Some of the key factors in forming customer expectations are: word-of-mouth

communications; personal needs; past experience; and, external communications. Attributes of the service organization that customers use to assess service quality include: reliability, responsiveness, assurance, empathy, and appearance. Gaps in service quality that explain the discrepancy have also been proposed: not knowing what customers expect; the wrong service quality standards; the actual service does not meet the service specification; and, promises of service do not match the service delivered (expectations have been raised too high).

With respect to IT applications, aspects of service quality that seem to be particularly important are timeliness (was it delivered when agreed) and budget (was the cost of development of the IT application as agreed). It should be noted that the issue of whether the IT application was delivered when *needed* is an organizational issue and hence impacts use quality. Similarly, the issue of whether the cost of the IT application was *reasonable* should be assessed in the light of the use made of the artefact. Service quality can be seen to have a mediating role between product quality (the form of the IT application, which can be controlled by the system developer) and use quality (the context in which the IT application is used, which is often unpredictable and cannot be controlled by the system developer).

In the customer satisfaction framework (figure 1) it is proposed that the customer can distinguish between the product quality of an IT application, the use quality of the IT application, and the service quality provided by the system development organization. To achieve IS quality it may be necessary to place a different emphasis on the production, use, and service views depending upon the situation. Of particular interest is the relationship between the views of quality. For example, can a high level of service quality make up for poor product quality, thus leading to an acceptable level of IS quality?

5 Implications and conclusions

In complex and messy situations a single perspective of customer satisfaction is unlikely to be sufficient. Multiple perspectives give a richer insight into a situation, but involve using different methodological approaches. The product perspective might be tackled using a hard approach (objectivist and consensual) with an emphasis on technology. The use perspective recognizes social factors which might be addressed using soft approaches (interpretivist), such as Soft Systems Methodology [Checkland 1981, Checkland & Scholes 1990] or a critical approach [Habermas 1972]. The service perspective is concerned with the relationship between the customer and the supplier. Personal aspects cannot be ignored in service quality; the traditions of marketing

and sales, although often anathema to technical personnel, may be able to make an effective contribution to IS quality.

The use of multiple perspectives does present a significant problem insofar as people are required to work with different assumptions about a situation, and to recognize that no one perspective is inherently superior to any other. To compound the problem further it is important to see the perspectives as inter-linked - it may be necessary, for example, to sacrifice an element of product quality to achieve use quality. If service quality is improved at the same time it may be possible to ameliorate the impact of the reduced product quality. To strike an appropriate balance in a situation requires the use of judgement, a competence gained through experience and, probably to a lesser extent, an awareness of theoretical issues.

In assessing customer satisfaction a mix of quantitative and qualitative data will need to be collected using different methods to reflect the different knowledge interests. The second phase of the IS quality research project is concerned with how the users of IT applications view quality and what forms of quality assessment might be appropriate when adopting a multiple perspective approach.

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