

Linking Customer Intelligence to Service Operations: Exploiting the Connection at GTE

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Abstract

Customer satisfaction surveys have long been conducted by regulatory fiat throughout large parts of GTE Corporation. With ongoing revolutionary change in the telecommunications industry, and the growing influence of service quality and quality improvement philosophies, there has been an irresistible Corporate urge to focus on customer needs, and to translate those needs into company action. For three GTE companies, we describe the processes by which customer information is systematically gathered, how this information is linked to internal operations and their measures, and how these links are used to improve service.

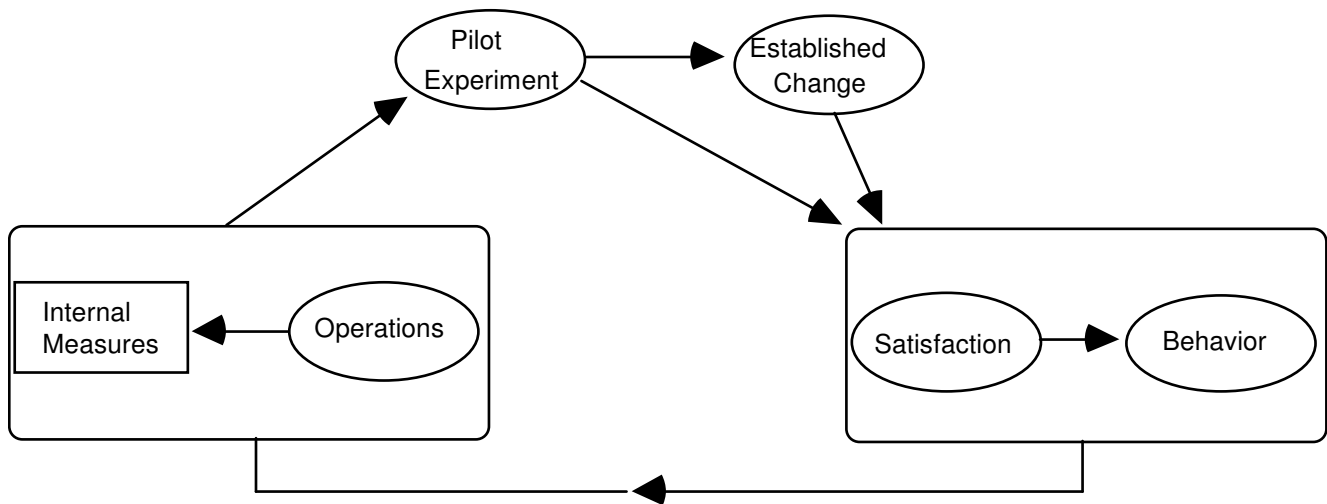
Introduction

Customer information is a central aspect of the operations of most large corporations in two main ways. First, customer satisfaction data is a measure of the organization's performance. It provides a snapshot of how the company's products and services are judged by the ultimate arbiters of value, and is, not coincidentally, a vital indicator of continuing revenues. It is therefore an obvious beacon of company wellness for each employee. Performance so measured can also be a sign of staff performance, and is a benchmark measure by which one's company can be compared with other similar or competing firms.

Constant improvement of the quality of a company's offerings has long been recognized as the crucial aspect of long-term economic viability, as U.S. carmakers have been harshly taught over the past twenty years, and the core of that lesson is that customers are the ultimate judges of quality. W.E. Deming, the statistician credited with leading Japanese manufactures into the world predominance they now enjoy, points out the economic efficiencies gained from high quality through elimination of re-work and gains in customer retention. (It has been estimated that it is fifteen times cheaper to retain an existing customer than to recruit a new one.) It follows that no company can survive for long without some form of customer opinion program that is thoroughly ingrained in its management structure.

This is an important change in direction for many companies. Historically, companies have managed themselves with the aid of a variety of internal measures, such as equipment downtime, defects per time unit, delivery timeliness and the like. The presumption was that, especially for regulated industries, specifications could be set once, and judgements need only be made on whether the production and delivery processes were in some sort of statistical control. With deregulation of many industries, however, and with consumers being confronted with a dynamic array of products and services, the utility of many internal measures is increasingly tied to customer opinion, intention and behavior.

Thus, customer data are not very useful unless their message is deciphered and related to company actions. To be effective, then, a customer satisfaction measurement program must be made part of a feedback loop between company operations and their internal measures, and customer evaluations and business outcomes (external measures):



Customer opinion must be extracted in such a way that it targets and prioritizes potential improvements in both service characteristics and service processes. Its statistical relation to internal measures taken by the company to monitor its service processes is used as supplemental data to suggest possible service changes. When piloted, these service changes are again evaluated using the same or closely related customer opinion measurements which initially uncovered the service problem. Obviously, such a total program requires a great deal of planning and intra-company cooperation, but its payoffs are equally great-economic health and long-term viability.

Many parts of this feedback loop have been carefully studied. Much of the work relating perceived quality customer behavior and company profitability has been summarized in Zahorik and Rust (1992). Issues surrounding the linkage of satisfaction to service operations have been discussed by Bolton and Drew (1994).

Difficulties in Translating Customer Information into Operational Behavior

Setting up a defensible customer satisfaction program is not a technically trivial task, and its managerial endorsement is often complicated by the very accessibility of the subject: nearly everyone has some idea about talking to customers, but the intuitive approach to some issues is not necessarily optimal or even good. For instance, one might assume that a "Good" response to the survey question "How would you rate the overall quality of your local telephone service over the past three months?" clearly indicates that service is acceptable and in no need of improvement. Researchers have found, however, that a sizable portion of customers support that response by explaining that transmission static and

other problems make service too degraded to warrant an "Excellent" rating, so that a "Good" rating is not *Good* at all.

Designing a survey questionnaire meaningful to both the customer and the sponsoring company is also fraught with difficulty. Customers are ingenious in misinterpreting survey items so that their responses are useless and the question's deficiencies are conventionally undetectable. In an old survey of small-business people, customer confusion about "data transmission lines" went unresolved for five years until a pretest experiment demonstrated the false basis on which the question was answered. One customer thought that his voice line also transmitted data, on the grounds that his voice was changed into electrons during transmission, and these could be interpreted as computer bits!

Customers generally see a company's service differently than the company itself does. Where a company sees (and wants to survey) a problem with a billing contact, the customer may see an unresolved repair. A customer evaluates the responsiveness of the company by its speed in repairing troubles and resolving billing disputes, while the company may see responsiveness as providing a quick dial tone. A special challenge of customer research is translating customer opinion into a call to company action.

Customer surveys generally contain a wide variety of questions, some asking for global evaluations ("Overall, how would you rate ..."), some for evaluations of functional attributes ("How would you rate billing service?"), some for evaluations of perceptual attributes ("How would you rate the company as being easy to do business with?") and some for diagnostics ("Does this problem occur all the time, or only once in a while?") Careful statistical analysis is usually necessary to organize and make sense of all this information. Statistical tests are needed to distinguish real changes from random variability in the results, and theoretical marketing models must guide how survey responses are admitted as inputs to overall satisfaction.

This mathematical modeling is not merely academic. Customer views of what attributes are most important are not reliably observed directly, and are better represented as coefficients in a statistical regression. (A few years ago, an airline survey identified "safety" as the primary attribute customers explicitly identified in choosing a specific airline, but this survey statement has little relation, in fact, to how specific flights are evaluated and chosen.) A study of customer reaction to a major renovation of telephone outside plant showed little change in simple customer satisfaction averages, but a model of satisfaction as a function of transmission characteristics showed the significant decline of the influence of some of the problems the renovation did, in fact, repair. In this case, the construction affected satisfaction through its causes, and not directly.

THE EFFECT OF CUSTOMER SURVEYS ON INTERNAL OPERATIONS

When properly planned and promoted, customer surveys provide a detailed look at a company's customers, and as such, they can be the subject of intense scrutiny at several levels and in several ways throughout the organization. This constitutes a strong emotional link between customer data and internal operations.

One of the most important effects of the Telephone Operations customer survey program lies in its indicating areas of user dissatisfaction and, through statistical analysis, pointing to possible avenues of improvement. Data from these surveys are therefore intensely scrutinized by operations managers, and are periodically analyzed in more sophisticated ways by higher level managers.

This scrutiny frequently becomes an extensive effort to affect service and improve survey ratings, often involving many functional areas within an operating company and occasionally groups in several different organizations across the Corporation. Consider the following examples:

- A. In 1989, the operating company of a midwestern state reacted to an abrupt drop in its residential customer survey ratings by forming an investigative team composed of experts in transmission, switching, repair procedures, customer service orders, and other functional areas, as well as General Office staff and research laboratory statisticians. A wide variety of service improvement ideas were formulated, including many which were inter-functional. Their implementation, albeit incomplete as of this writing, has apparently halted the slide in ratings which prompted the creation of these teams.
- B. Cable replacement at one central office in the northwest was seized by company management as an opportunity to relate a physical service improvement and consequent survey rating changes, thus exploring the second half of the customer feedback loop. Interdisciplinary teams of network specialists were formed to choose appropriate control locations, while transmission engineers monitored the selected plant, and public affairs and advertising experts formed testable strategies for dealing with affected customers. The survey results showed a post-construction drop in quality ratings followed by a large rise six months

later, while customer perceptions of improvement in service showed consistent increases.

Customer opinion surveys are an extremely powerful tool in reducing the gaps that may occur at these links. They directly identify failures to perform against service delivery specification as well as provide the starting point for identification of inadequate service specifications. By providing a pipeline to the customer's perception, these surveys also provide a means to keep management strategies in line with customer needs as well as providing a data source for interpreting those needs through sophisticated analysis. Through the iterated operation of the processes indicated in Figure 1, a survey measurement program marks the beginning and end of a service feedback loop as mentioned above.

While the proper use of customer surveys among one's own customers can be sufficient to avoid certain gaps in the service quality model, it does not address the final quality requirement—competitive advantage. The emergence from a monopolistic environment has created in telecommunications and other industries a fuzzily dichotomized scenario of partial regulation and partial fierce, open competition. It is vital that service quality be benchmarked against all major competitors. Customer surveys then also provide information on service quality perception among competitors' customers and the determinants of choice among competing products and services. In this way, they are the link between telops integration through focusing on a common goal (customer satisfaction), and competitive advantage in a business sense.

Integration among distinct organizational entities is the key to customer survey value and is largely responsible for establishing the link between customer needs, service delivery, and the perception of quality by customers as measured by surveys. This linkage ultimately leads to customer base retention and expansion, as we said above. Within the context of customer surveys, we identify three forces for integration.

- a) First, the set of corporate customer opinion surveys are a focal point for the separate business purposes of a variety of corporate and company organizations.
- b) Second, through the contributions of these many groups, the surveys themselves have many design features which ensure their ease of use for all the user groups.
- c) Third, in the course of using these surveys, the organizational groups have ample occasion to interact with each other, so that diverse viewpoints are exchanged and common purposes developed. Furthermore, the other surveys sponsored by these groups (e.g., of

customer contact employees) provide vehicles for group interaction, through inter-group survey design and linked results.

Corresponding to these integrating concepts, there are three ways in which the survey process itself which may be used to structure the integration of diverse organizational purposes.

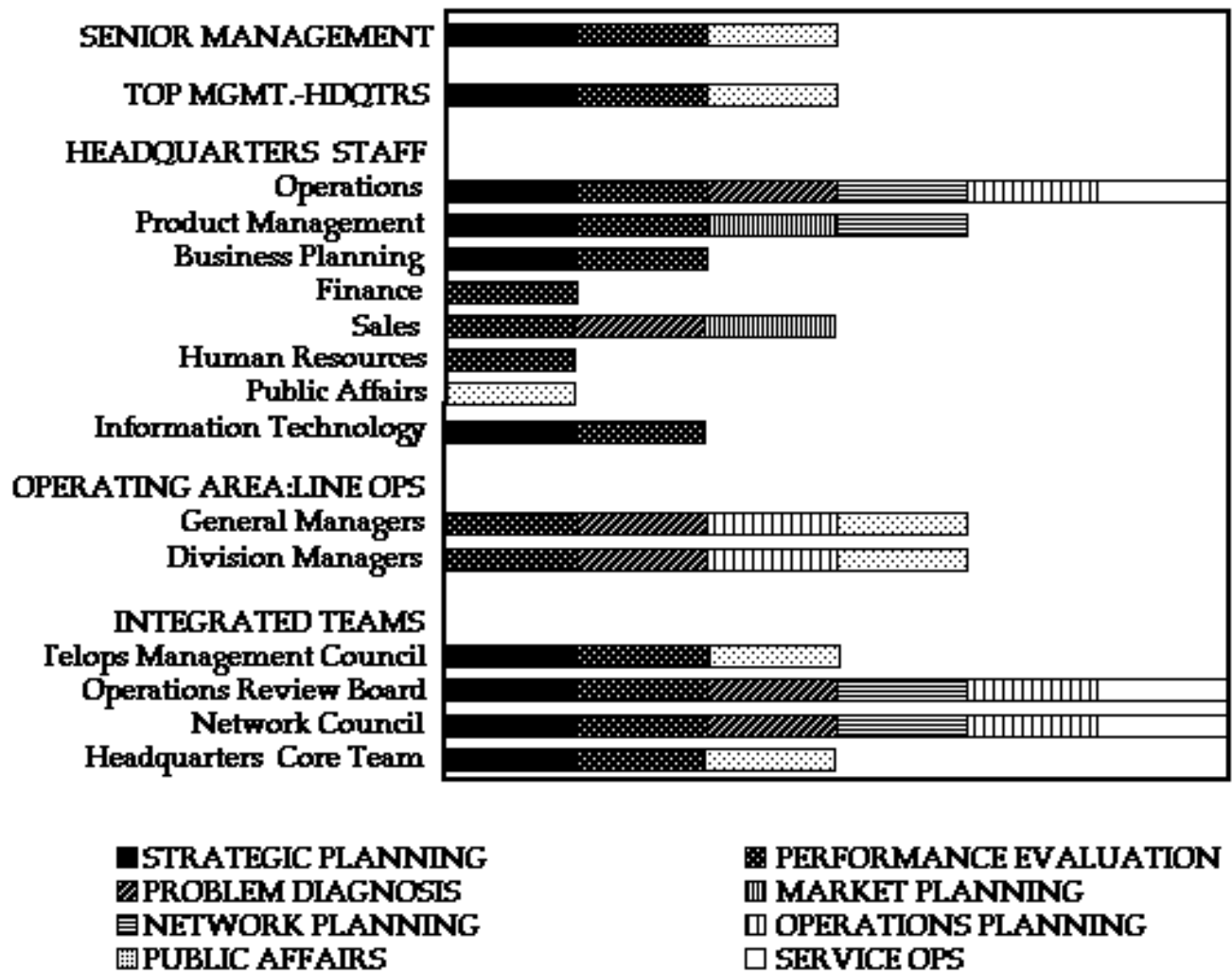
1. Survey existence: The survey acts as a single focal point for diverse functional areas, as a core data base for strategic planning, as an unbiased arbitrator of quality, and as a cross company common resource.
2. Survey design and specification: Such design specifications as rating scale choices reporting conventions engender widespread usage, understanding, applicability, and acceptance.
3. Linkage to other surveys: The integrated design and analysis of several parallel surveys (such as those interviewing internal customers and customer contact employees) fosters functional integration, provides information on specific issues from multiple perspectives, and supports crossfunctional strategies and cooperation.

It is apparent that the first two corresponding forces mentioned in each list, namely surveys as a focal point and survey design as an integrator, are virtually equivalent. However, the corresponding third points are slightly different, the former involving group interactions in the course of using the customer surveys, and the latter involving joint usage of different surveys.

The following diagram shows the extent of customer surveys use within GTE, where the results are of interest to Corporate organization, the division's headquarters and its operational units.

Survey Usage by Different Entities

Figure 3.
RELATIVE SURVEY USAGE



Here are specific examples of these uses:

1. Strategic planners use the aggregate results of these surveys to probe the minds of GTE and competitor customers to identify their key needs, dissatisfaction sources, and competitive opportunities.
2. The staffs of the telephone companies use the surveys to assess quality and its trends over time, and to evaluate service office and other organizations' performances. These groups also effectively act as customer advocates in the sense that they promote company action for the express purpose of raising satisfaction ratings.

3. Marketing groups are primarily interested in the surveys' probing of consumer behavior, its information on potential competitors, its indication of new or restructured services/products to meet customer needs, and the sales contacts it generates.
4. Network engineers, and other telco operating personnel, use the surveys as indicators of unreported physical system problems, and as indicators of the effectiveness of improvements in the physical plant.
5. Marketing planners and network planners use the surveys to respectively develop marketing strategies and network technology deployment plans. Operations planners use detailed survey results to guide the priority of placement of the new technologies, and to guide other capital and service programs. Service operations personnel develop and implement the latter programs.
6. Public affairs departments are interested in the customer concerns embodied in survey responses, and in perceptual changes wrought by changes in communications efforts.

The seriousness with which these survey results are viewed also plays a role in extending their use. At the direction of headquarters staff, the operating companies use these results to set long-term strategic performance objectives, for which telco upper management (e.g., the company president) is held responsible. Furthermore, reports are monitored monthly and narratives required for any business unit whose ratings do not fall within specified tolerances of those objectives. It follows that nearly all personnel in the operating units have at least an indirect interest in the survey results. These entities are thus inspired to "buy-in" to the survey process and thereby integrate their aims with other survey users.

Group Interactions In Using Survey Data

In the preceding section, we described the unification of the goals of various groups by their common, but individually distinct, interest in the customer survey results. Many of these groups also integrate through their interaction in processing survey results. We give some instances in the following list.

1. During September 1985, after three successive months of declining residential satisfaction rates with direct distance dialing, the corporate Service and Network departments formed a joint task force to diagnose and correct the problem. The transmission problems which were identified as a primary contributor to the rate declines were attacked by interfunctional teams which created noise mitigation programs. In

addition, one operating unit created an intercompany team with exchange and interexchange carriers. (As a result of these programs, direct distance dialing survey results showed steady subsequent improvements.)

2. In early 1986, a substantial decline in customer satisfaction with billing services was traced to decreased clarity of the customer's monthly bills. Integrated interfunctional teams comprising representatives from customer service, business relations, finance, and information management systems were created at the corporate level to propose solutions. Operating units simultaneously worked with these teams as well as with customer focus groups. Since some proposed format changes affected interexchange carriers, they were brought into the discussions as well. (As a result of these meetings, the monthly bills were redesigned and survey statistics rebounded.)
3. In the past year, GTE network planners needed to make certain decisions in deploying new technology to meet customer needs. From the survey-identified priority of customers for transmission and call completion quality, strategy-setting corporate teams from service, network, and marketing groups worked with operating unit staff to set new standards on the implementation of switching and transmission technology. Subsequent surveys have confirmed favorable customer reaction to this new equipment, in places where it has been introduced.

A more general format for intergroup interaction, then, occurs in the following way: Many organizational groups need information beyond what is routinely produced in the survey reports, the first step of which is often the production of more detailed, or more statistically sophisticated, data from the surveys. Since the survey staff is the formal client of the research firm which produces the survey results, the organizational group in question will engage in frequent consultations with that staff. This general interaction occurs in many ways, such as when an Operations group needs further survey details (e.g., What do customers give as the reason for their dissatisfaction with billing service?), or when a Marketing group asks for some new analysis of the existing survey data (e.g., What dissatisfiers are most highly related to a customer's overall evaluation). Another way in which these interactions occur is when a standard survey occasionally suggests the need for some special study. Because of the widespread use of the customer surveys, the Quality Positioning department is widely regarded as the source of survey expertise and experience within the Corporation. Therefore, that organizational group is the focal point for any other group which contemplates the planning of a special survey.

Finally, direct consumers of survey results occasionally note trends or anomalies which point to some service delivery problem. That group then works with the the operating group (e.g., transmission or switching engineers) to localize the problem, and test for its correction. The group fixing the problem may itself be a cross section of functional groups and may not even be totally internal to the Corporation.

The Role of Other Surveys

In previous sections, we have discussed the effect of GTE's customer survey program in integrating the goals, approaches, and operations of diverse organizational groups. Here we consider the motivation for, and integrating effect of, other quality surveys in their relation to customer surveys.

We extend the concepts of cross-group and cross-functional integration described earlier by formally recognizing the nonindependence of the survey efforts as tools for competitive advantage. Internal and external survey processes are seen as intrinsically related. Cross-design and analysis of several parallel surveys fosters functional integration, provides information on specific issues from multiple perspectives, and supports cross-functional strategies and cooperation .

A specific example of such a survey is the following. GTE's employee opinion survey periodically gauges the perceived work climate by interviewing employees in each division. A link can be discerned between our customer surveys and the employee survey by focusing on employees who have considerable customer contacts such as Repairers and Installers. It has been suggested that such employees personify the service offered (See Shostack, 1977) and that their actions have a disproportionate effect on customer opinion. These employees are also viewed as most capable of assessing customer satisfaction directly, and the current employee survey asks them to project in this manner. By concentrating on employee effectiveness and customer knowledge, we can minimize the gaps between specification and delivery of service and communications to customers. See Schneider and Bowen (1985) for discussion of these concepts in use in a banking environment. Solomon et al (1986) provide a theoretical outline for the role of customer contacts.

Other formal surveys and internal measurements are also linked to the customer survey. Modeling of relationships between customer and employee survey responses and internal, operational quality measures such as installation time helps to avoid gaps in translating expectations into specifications. Thus this final level of integration introduces the customer perspective into all facets of operations and encourages cross-utilization of information by multiple groups and from many sources.

LINKING EXTERNAL AND INTERNAL PERFORMANCE MEASURES

There are many approaches by which customer data can be used to improve company operations and ultimately objective performance. In an earlier section, we described a primary obstacle to the linkage: deciphering what the customer is saying. The next step is relating that core of information to company characteristics. Designing or redesigning a new product or service from customer desires can be aided by such QFD (Quality Function Deployment) techniques as the "House of Quality," (Hauser and Clausing 1988), or "blueprinting" (e.g. George and Gibson 1991). Defects in existing products and services can often be treated with such quality improvement tools as Pareto charts and fishbone diagrams (Ishikawa 1976). In this paper, however, our concern is the deployment and use of the more objective, fundamentally statistical relationships that can be constructed.

Motivation

Why would a company try to manage itself using linkages between internal and external measures? We have pointed out that while internal measures can keep a company on track and satisfy regulators and other monitors, they are unresponsive to the dynamic business environment in which the company operates. Customer measures, on the other hand, are not very useful, and can even be a distraction, unless they can be related to operations. Since as internal data is closer to company operations and therefore more suggestive of ways in which a better product can be generated, here are some business reasons for forging what linkages can be made:

- A. *Predict customer ratings or behavior from internal measures.* For a specified level of some group of internal measures, estimate the expected level of survey ratings. This might be useful in meeting mandated ratings targets, particularly at less aggregated organizational levels than possible from the current survey program.
- B. *Predict levels of internal measures needed to reach specified customer satisfaction goals.* When the ultimate goal is to satisfy customers, interest may focus on the levels of internal measures needed to ensure satisfaction, perhaps in support of, or opposition to, regulatory pressure.
- C. *Predict how customer behavior or ratings will change based on changes in internal measures.* Internal measures are more directly

related to the provision of service than are survey measures, and they may be more easily controlled. If this is true, the telco manager may need to know how to control internal measures to achieve increases in customer satisfaction or retention.

- D. *Diagnose low customer ratings.* An initial phase of the service feedback loop lies in using customer survey data to indicate areas of possible service improvement. Insofar as internal measures are closely related to actual service provision, relationships between internal and external measures can thus point to needed improvements in the provision process.
- E. *Evaluate personnel and organizations.* This is a special case of the diagnosis of dissatisfaction.
- F. *Evaluate the measures themselves.* Some internal/external measure pairs intuitively appear to be related in a certain way. For instance, the speed with which a CSOC representative answers a customer call, and the customer's survey rating of CSOC answer speed should, ostensibly, be highly correlated. Disconfirmation of this and other expectations might be grounds for an examination of the validity of one or both measures. In particular, redundancies might be discovered which could lead to an easing of reporting requirements.

It follows from the disparity among these linkage motivators that there will be a variety of interested company parties for each relationship to be studied. Company management is likely to be interested in the prediction of customer opinion and behavior based on internal operations, and they and operations staff would surely need to know how customer ratings will change as internal measures change. Operations staff, and quality departments, can use linkages to diagnose problems, and they and human resources may use linkages to set reward structures. Additionally, performance monitoring experts will take an interest in the utility of the measures themselves. All of these uses are either explicit or implicit in the examples given later.

One aspect of the operations/opinion linkage is worth special mention. Implicit in the servicing of individual customers is the customization of the service offering, i.e. the differential treatment of different segments of customers. On the operational side, this becomes a problem in resource allocation which ideally should be an issue in asset (e.g. satisfaction, loyalty, revenue, profit) maximization subject to various constraints. One might wish, for example, to maximize the product repair speed satisfaction X revenue subject to the constraint of an overall average repair speed target.

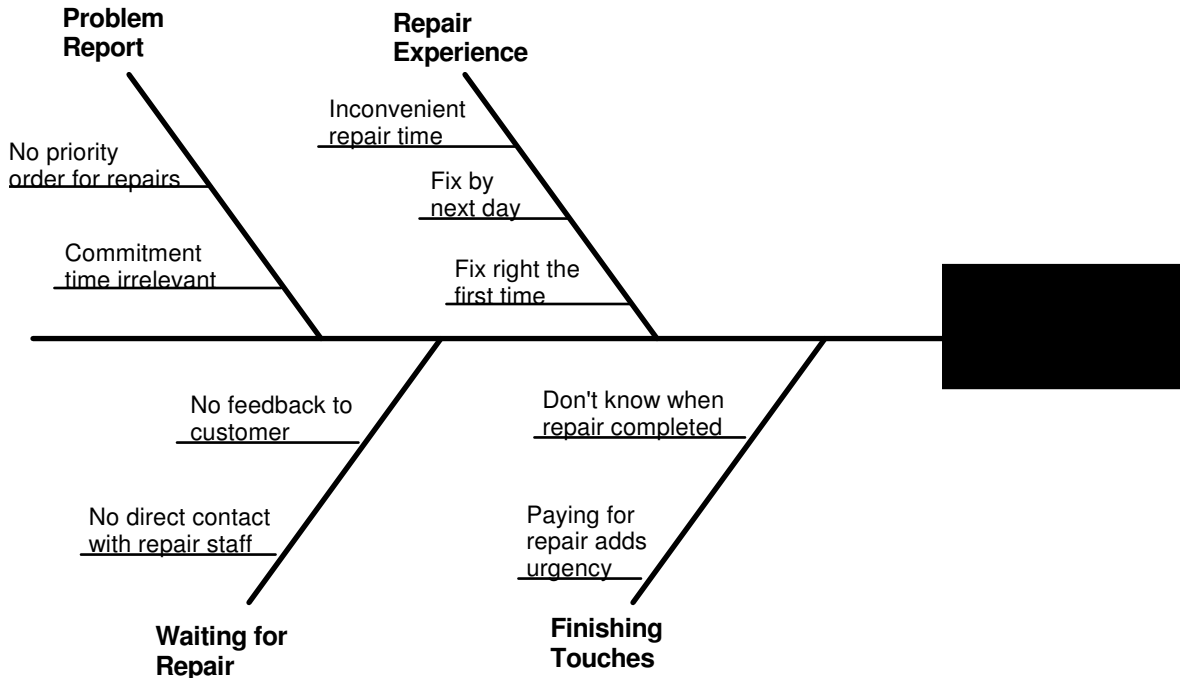
Solution of such a programming problem is dependent on the specification of satisfaction as an explicit function of repair speed.

Understanding the Linkage

Some customer/operations linkages are self-evident, and need no explication. Others may be puzzling in themselves, have an obscure link to company management, or be accompanied by conflicting information. Consider the observation that customer satisfaction with a repair is highly dependent on the amount of time the repair takes. A survey of customer evaluations of recent repairs, matched with internal data for those repairs, shows satisfaction levels (particularly the likelihood of an "Excellent" response) dropping as repair times increase. However, a great deal of other information, not all of it self-evidently consistent, is available from these internal and external databases, including:

- nearly all verbal repair speed commitments recorded as met,
- perceived repair times and internally-recorded times do not exactly coincide, with perceived times being both sometimes greater and sometimes shorter than official times, and
- the customer's perception of meeting deadlines is related to repair clearing time, but not to whether GTE's stated commitment time was actually met.

Expert opinion from repair employees is therefore indicated to decipher these bits of information. Information and ideas can often be elicited and organized via such quality management techniques as affinity diagrams, interrelationship digraphs, or the like (Gryna, 1988). After one or two rounds of brainstorming among repair representatives, repair staff and management, the consensus of the group can be summarized in a fishbone diagram popularized in the quality management literature (Isikawa 1976).

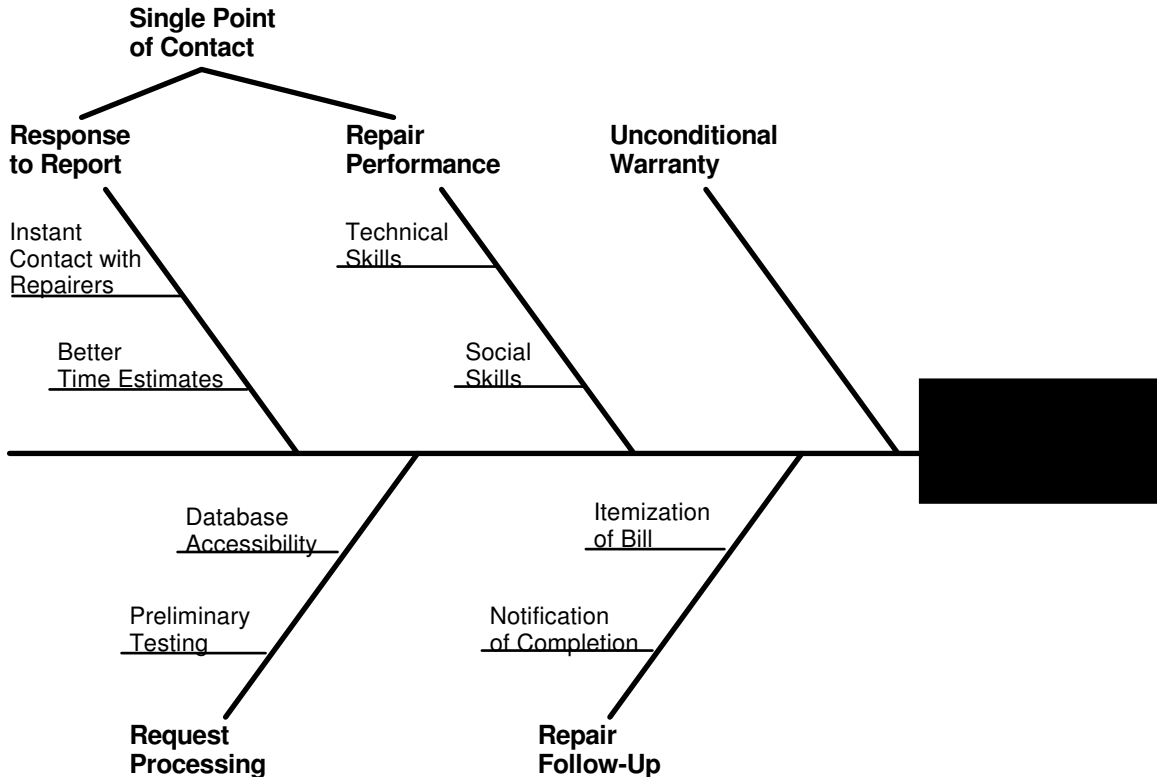


These possible interpretations are a step closer to company operations, and can be used to consider action plans to improve repair times and therefore customer satisfaction, as indicated in the next section.

Using the Linkage to Improve Operations

In many cases, the customer opinion-internal measures relationship gives self-evident suggestions for operations improvement. Cellular telephone service cancellation which has been linked to bill-disputing customer service calls strongly suggests a need for the company to clarify its billing structure. In most cases, however, there are ambiguities and options involved in the company's reaction to discovered linkages, and these uncertainties are often well-handled by the idea-organizing and -clarifying techniques of the quality improvement literature.

In the previous section, we showed that the relationship between time-to-repair and customer satisfaction with that repair depends on meeting the customer's definition of timeliness.



The main branches of this diagram roughly correspond to those of the previous section to interpret the repair time/satisfaction link. Now, however, specific actions are considered to remedy those potential causes. Most of these are straightforward responses to the previous interpretations. One exception is the concept of a "single point of contact" or "one touch customer care" whereby the customer can avoid the company's repair bureaucracy by being assigned a single liaison employee. Note that an important addition is the notion of an unconditional warranty, which is considered as a "safety valve" in the event that the other actions are unsuccessful at improving satisfaction with repair times.

APPLICATIONS

GTE Telephone Operations

In early 1992, a service guarantee program was introduced for small business customers in the area around Beaverton, Oregon. Consequently, several databases were created which contained various kinds of customer information. For each small business customer requesting a repair during January-May 1992, internal repair data were extracted from the TAS database. This dataset contained such data as reporting, disposition and clearing times, type (including out-of-service status) of trouble reported, and information on the final disposition and cause of the reported trouble.

A random sample of customers with repair experiences between February and May was also selected, and a truncated version of the BCOS questionnaire was administered. This questionnaire included the BCOS general evaluation and repair specific items, as well as two questions about the customer's awareness of the guarantee program.

A final dataset comprised a list of customers who had invoked the service guarantee between January and May. In many, but not all, cases dates of the repair and subsequent guarantee invocation were recorded.

It is thus possible to statistically analyze those internal repair attributes associated with invocation of the guarantee, since this was a vital piece of information in determining the viability of the program. The initial status of telephone service, that is, whether the line is out of service (OOS) or not out of service (NOS) significantly affects whether the repair guarantee is invoked. Obviously, a problem resulting in a service outage is more likely to generate a claim for the repair guarantee than some other problem, perhaps because an outage represents a potential loss of business for the consumer. For OOS problems, however, the likelihood of a guarantee invocation increases as the clearing time increases, abruptly jumping when the time exceeds 24 hours. This effect is statistically significant, and apparently important. Business customers are relatively likely to use the service guarantee as a recourse when their telephones are out of service for 24 hours or more.

An important component of business customer service was discovered through examination of the interplay between the meeting of official repair time commitments, measured internally, and retrospective customer opinion measured through a satisfaction survey. Virtually all repairs met the time commitment given by the telephone company on receipt of the trouble report. Consider the association between repair duration and DEADLINE: "How would you rate . . . on meeting repair deadlines?"

Clearing Time	_4 hrs	4<Time_8	8<Time_16	16<Time_24	24<Time_48	>48 hrs
Excellent	50.3%	41.4%	33.3%	44.2%	40%*	20%*
Good/ Excellent	84.9%	96.5%	77.8%	76.8%	60%*	80%*

*: based on <5 subjects

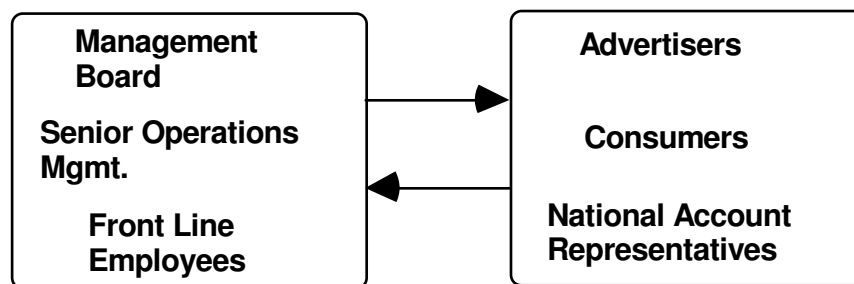
Further, a subsequent analysis showing no association between the customer's overall repair evaluation and the company's formal meeting of its commitment. The large decrease in G/E rating as repair durations exceed 8 hours (a working day) suggest that the repair deadlines business customers consider are those imposed by their own businesses, and not that of the telephone company.

It therefore made sense to let the repair guarantee be unconditional, and particularly independent of any formal commitment the company might give verbally. This is in fact what was subsequently done.

GTE Directories

GTE Directories Corporation (GTE/DC) is the publisher of white and yellow page telephone directories for a large number of local telephone companies in the United States and abroad. Through a series of management steps dating back to 1986, this organization has transformed its operational structure to emphasize customer input as the major motivator of quality improvement. Yellow Pages has many levels and types of customers, residential telephone subscribers and local telephone companies among them, but the main source of revenue is the Yellow Page advertiser.

GTE/DC has surveyed these customers for tracking purposes since 1989. Results and analysis are periodically reviewed by a Management Board, Cross-Functional operations teams, and such front-line employees as sales representatives, customer relations representatives and customer credit departments. In fact, an early execution of the satisfaction measurement program was extensively analyzed to form the basis for GTE/DCs main quality strategy for the 1990s. Additionally, the survey program was designed to identify and prioritize service problems, so that relevant departments can take action as needed. There are three distinct customer groups: individual yellow pages advertisers, national account representatives placing uniform advertising for national chains. and consumers reading the resultant advertising. The following diagram summarizes the company and customer groups whose opinions and actions are inputs to each other:



The company Sales department has been the beneficiary of recent internal/external linkage scrutiny. The diagnostic component of GTE/DC's customer satisfaction survey has consistently pointed up the importance of the sales process, and specifically the strong linkage between sales satisfaction and customized sales consultation to help the advertiser maximize advertising effectiveness. Subsequently, a cross-functional team from marketing, sales, marketing and MIS was organized to develop an understanding and action plan based on this linkage. Focus groups with current and potential advertisers specified the type and format of consultations that were needed. This information was then used by the aforementioned team and a standing sales process team to develop a continuous sales training program staffed by regional field trainers and supported by regional operations managers. Note that implementing this action plan required the cooperation of all of the following departments:

- Market research, to design the efficacy study and develop the customized market data for each advertiser,
- MIS, to develop databases and their accesses for sales representatives,
- sales training, to develop and communicate the consultation process,
- the management board, to communicate this fundamental reengineering and to coordinate the accompanying company cultural change,
- human resources, to modify the sales reward structure to allow more flexible sales.

A quasi-experiment was designed to formally evaluate the effectiveness of the new sales device both in terms of customer satisfaction and financial effectiveness. Additionally, survey results and customer feedback are used to continuously improve the added value of the sales effort

GTE Mobile Communications

SUMMARY AND IMPLICATIONS

Several generally valid conclusions can be drawn based on GTE's experience with internal/external data linkages.

- Discovering specific and interpretable relationships between subjective customer perceptions and intentions, and company operations frequently leads to useful understandings of customer needs and helps elevate customer opinion to its rightful prominence in a quality-oriented company.
- The management structure must be sufficiently flexible to allow the open and actionable consideration of how customer opinion relates to operations. These discussions are especially important at the data assembly stage and at the action-recommendation stage.
- Motivation for the customer/operations link often comes from a source outside the company, such as the QI community, outside consultants or the Malcolm Baldrige Award committees, and these energy sources must be channelled and customized for the company's particular situation and history.
- For historical and organizational reasons, internal company information is likely to have been gathered in isolation from customer data, complicating or degrading their useful concatenation.
- Both numerical relationships between internal and external measures, and less quantitative operations/customer behavior linkages may need to be translated into terms useful to a company manager. The translation may be in the form of other data (sometimes from the same study), or may be an organization of managerial and staff deliberations.
- The summarizing methods of the quality improvement literature (affinity diagrams, fishbone diagrams, House of Quality constructions, etc.) can frequently be used to develop action plans based on internal/external linkages.

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