

Quality Control in Service Industries

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Introduction

All institutions, whether for manufacture, service or other purposes, face problems of attaining quality. In the case of the manufacturing industries, extensive work has been done in the last three decades to identify the quality problems which are common to all manufacture, and to discover common solutions to these problems. This search for commonality has led to identification and successful application of various universals of quality control. Some of these universals (e.g., process capability, the Pareto Principle, quality cost analysis, statistical methodology) have been of great aid to practitioners.

The present article examines the problems of commonality as it applies to quality control in service industries.

What is Service?

Service, as used here, is work performed for someone else. The recipient of the service (often called the client) may be:

- a an individual user, e.g., the housewife (often called a consumer)
- b an institution, e.g., a company occupying office space under a lease
- c both, e.g., users of electrical energy from a central source.

Service Work exists for a variety of reasons, principally to:

1. Enable the client to meet needs which he would otherwise be unable to meet, e.g., distant voice communication.
2. Offer the client alternatives which are superior in cost, time, convenience, etc., e.g., public transportation.
3. Meet a wide variety of human psychological and physiological needs, e.g., amusement, freedom from disagreeable tasks, opportunity for learning and creativity.

Service work may include sale of a product, e.g., food in restaurants, spare parts used during automobile repair. However, such sale of a product is normally incidental to the work performed for the client.

Definitions for 'service industries' usually *exclude* manufacture, agriculture, mining and construction. The definitions usually *include*:

- Public transportation.
- Public utilities (telephone communication, energy services, sanitation services).
- Restaurants, hotels and motels.
- Marketing (retail food, apparel, automotive, wholesale trade, department stores).
- Finance (commercial banks, insurance, sales finance, investment).
- News media.
- Personal services (amusements, laundry and cleaning, barber and beauty shops).
- Professional services (physicians, lawyers).
- Government (defense, health, education, welfare, municipal services).

Characteristics of a Service Company¹

A service company is a system of special facilities and skills, organized to provide services to clients. It sells the benefits of this system to its clients in a variety of ways, for example:

- lease of facilities, e.g., apartments, office space
- use of facilities, e.g., bus rides, telephone calls
- professional advice, e.g., medical, legal
- health maintenance, e.g., hospital service
- product maintenance, e.g., automobile repairs
- relief from self-service, e.g., restaurant service.

In carrying out its mission the service company usually sells direct to the user. This is true not only as to large industrial users but for numerous small users as well. In this latter respect, the service company differs sharply from the manufacturing company.

These direct sales bring the service company into multiple contact with large numbers of consumers, giving rise to huge numbers of individual transactions. All of these transactions have their impact on human beings, many of whom are articulate.

A favorable aspect of these direct contacts with the consumer is the opportunity for good feedback as to fitness for use. In this respect, the service company has an easier job than the manufacturing company, which is comparatively insulated from the consumer, and must resort to special studies to secure adequate feedback.

The extensive personal contact also sets up some relationships which are inherently uncomfortable for the consumer. To secure some services he surrenders his property into the custody of the service company, e.g., baggage for transport. The service company holds this property in captivity, and a failure or a delay in returning it can greatly inconvenience the consumer. In other cases it is the consumer himself who feels he is held captive. The most usual form of this is waiting in line in a queue, or waiting for service when there are no effective alternatives.

For some service failures the consumer can make a direct complaint and claim. He may be compensated for loss of property, but he is seldom compensated for loss of time or for his

annoyance. What he can do is to turn to competing service, if they exist. He can also do damage to the company by publicizing the trouble he has had. If the service is a monopoly, he can join other disgruntled consumers in collective efforts to force improvements through publicity or political action.

Design of Service Quality

In establishing their quality of design, the service industries are bound by the same broad considerations as are the manufacturing companies: identification of what constitutes fitness for use; choice of a design concept which is responsive to the identified needs of the user; translation of this concept into specifications. Beyond these basic needs, the service industries must give special emphasis to several added aspects of quality of design which are inherent in dealing with a clientele of many consumers.

'Made to Order' Designs'

Human beings exhibit a wide spectrum of needs and likes, all stemming from differences in status, personal taste, etc. The service industries respond to this spectrum by such methods as:

1. Creating a range of choice for the client, e.g., the restaurant menu.
2. Providing a modular system design which permits the user to direct the system in accordance with his special needs. The classic example is the automated telephone system which permits the consumer to reach millions of destinations, unaided by human intervention.
3. Providing assistance to meet that residue of 'to order' needs which the engineered system cannot provide directly to the consumer, e.g., tailoring clothes to measure.

While these made to order designs are an essential aspect of service quality design, they are also a breeding ground for errors, i.e., in interpreting the special needs and in conforming to them. In addition, the special designs may require special pricing, again multiplying the chances of error.

Technical Assistance

The consumer has extensive need for such assistance. In some cases his technological ignorance requires that qualified specialists be available to diagnose his needs, e.g., human illness or a television set which is out of service. In other cases, the need is mainly for explanation, e.g., complex contract provisions; train time tables.

Simplicity

In offering a design of service to thousands or millions of clients, the need for simplicity is absolute. Some consumers are unable to understand printed instructions. Many more consumers are unwilling to take the time to learn, and their unwillingness creates trouble for them and the company as well.

Auxiliary Services

In some countries the service industries teem with 'free' services which are provided to clients as part of the quality of design. For example, an automobile service station will clean the client's windshield and check the status of oil, batteries and tires while the pump is filling the fuel tank. It also provides washroom facilities for the travelers. Such auxiliary services are designed partly to meet competition and partly to meet a special need of consumers for 'well-being'. (See below).

Time as a Parameter of Service Quality

A striking feature of the service industries is that the time required to provide service is regarded as an element of 'quality'. In manufacturing companies, delivery time is certainly regarded as a vital parameter of overall customer relations. However, delivery time is not regarded as a part of 'quality'; it is a wholly separate parameter. The organization setup reflects this. A separate department (Production Control, Materials Management, etc.) is designated to establish standards (schedules), measure delivery performance and report on adherence to schedule.

Some service industries distinguish sharply between different subdivisions of time:

Access Time

This is the length of time which elapses from the client's first effort to gain the service company's attention until he has that attention. The standard for this 'accessibility' is expressed, for example, in the form: 80% of the incoming phone calls should be answered within 15 seconds after the first ring.

Measurement of some types of access time can be done by automated recorders. More usually, special observers must conduct sampling studies.

Queuing Time

Some services involve a queuing of clients due to variable loads or to considerations of economy. In such cases the consumer is concerned with:

- a the length of the queue and therefore the waiting time. The service company is in a position to plan this based on past history and probability considerations (queuing theory).
- b the integrity of the queue, i.e., adherence to the principle of first come-first served. Some companies organize this by use of assigned serial numbers. This also permits the clients to sit while they wait, and to occupy themselves with reading material provided for the purpose. This may be embellished by play facilities for children.

Action time

This is commonly defined as the interval between taking the customer's order and providing him with the service requested.

In designing the time aspect of service, it is important to stress the *customer's viewpoint* of elapsed time. To a railroad or an airline, the emphasis on travel time may be from terminal to terminal, and this is clearly important. To the shipper or passenger, the emphasis is from dock to dock or from point of origin to point of final destination. The customer will make his decisions on this point to point basis, no matter what the carrier thinks.

A second major reason for the critical importance of service time is the cumulative effect of delays. A byproduct of organizing human affairs around complex systems is that when those systems fail, a great deal of human activity is disrupted. For example, a vital machine tool is delayed eight days during railroad shipment. Because the machine is critical to a factory production line, the entire factory is delayed for eight days. Some or all of this delay may extend to the factory's customers, and to *their* customers, etc.

As a corollary of the critical nature of service time, the service industries should:

1. Establish standards for the various components of service time, and set up controls to enforce these standards.
2. Improve present service time by studying enough cases of service to find out just where the

time is being consumed.

- 3 Make service time a major parameter in design of future systems. For example, an entire new industry of 'fast food' has arisen in the USA to meet the needs of many clients who choose not to devote time either to food preparation or to waiting in restaurants.

Design for Consumer 'Well-Being'

A further parameter of service quality is consumer 'well-being'. This parameter is difficult to define, but easy to exemplify. For instance, a serviceman repairs a household appliance. He does so promptly and with competence. His charges are fair. What the housewife remembers is that he tracked mud into her kitchen and was rude.

The service industries recognize that there are positive and negative aspects which affect consumer well-being. On the positive side are such matters as:

Atmosphere

Some service industries take active steps to create an 'atmosphere' which will meet the tastes of their clientele. Obvious examples are seen in the industries devoted to travel, leisure and entertainment. The clients are a mixed lot: commercial travelers; older, retired citizens; young unmarried people; couples with young children, etc. These categories differ in their tastes to such an extent that the service industries design differences in decorations, furnishings, refreshments, provisions for leisure time, etc.

Feeling of Importance

Because service is work done for someone else, many consumers view the relationship between client and service company as one akin to master and servant. This viewpoint is flattering to the ego of the consumer and leads him to expect attention, courtesy, respect, and still other elements common to a master-servant relationship. Service companies are well aware of this viewpoint, and some design into their plan of customer relations some elements which enforce the consumers feeling of importance: formal 'welcome' symbols, various forms of continuing attention, free souvenirs, 'thank you' letters, etc.

Information

Still another element of well-being is to know what to expect. For example, when a train is late, the passengers waiting in the station to board that train want to be informed as to the expected departure time. This 'need to know' is not for the purpose of enabling the traveler to change plans depending on the length of delay. (Unless the delay is overwhelming, virtually all the passengers will wait it out anyway). Instead, the need to know is based on an instinctive human desire for mastery over the environment. The consumer who knows what to expect derives a feeling of well-being from this knowledge, since he has the information needed for predictability and, at this option, for choice of alternatives. Lacking knowledge of what to expect, he is at the mercy of rumors and surprises, with the result that his anxiety rises.

Safety

Because the user entrusts his person, property and well-being to the custody of the service industries, 'service safety' becomes as vital as product safety. The hotel, the restaurant, the carrier, etc., all have responsibilities for this safety. These responsibilities were on the statute books for centuries before the current wave of activity in product liability

Continuity of Service

Many designs include provisions for maintaining continuity of service despite failures. Telephone companies and airlines make use of alternative routings in the event of unavailability of standard routings. Professional service groups (doctors, lawyers) organize their work in a way which permits continuity in the absence of any member.

Conformance to Design

In the service industries it is necessary to distinguish clearly between two very different kinds of conformance, 'internal' and 'external'.

Internal Conformance

Internal conformance relates to those aspects of the service company's operations which cannot be sensed by the clientele. For example, the electric power company establishes standards for quality of fuel bought and for energy yield per ton of fuel.

Generally, the service industries' approach to internal conformance is similar to that used in the manufacturing industries for process control, cost control, etc.

External Conformance

Other aspects of service company operation can be sensed by the consumer. These aspects are by no means limited to the obvious, *sine qua non* elements of the design, e.g., wholesome restaurant food, clean hotel beds, correct telephone connections. They include also the features which contribute to timeliness and well-being.

In many cases what appears to be 'internal', i.e., the system, processes and equipment, can have severe impacts on the consumer. For example, the control of hospital medication errors is, on the face of it, squarely up to the personnel, notably the nurses. On closer examination, the 'system' is seen to be a major contributor to these errors. Similarly, because many service companies serve large numbers of small clients, the adequacy and maintenance of the data processing system is an important factor in the accuracy and timeliness of invoices, credit for payments, etc.

This interrelation between internal and external conformance requires that the review of internal conformance not be limited to that carried out by the departmental supervision. Many service companies recognize this need, and set up independent audits which are all-pervasive.

Standards of Conformance

Adherence to service specifications poses the universal problem of finding the optimum level of conformance. One approach is to use a 'market' standard based on analysis of performance attained by multiple members of the same large service organization. This approach is widely used in the Bell System, which operates hundreds of telephone exchanges, by the U.S. Postal Service, by the Howard Johnson chain of hundreds of restaurants, and by numerous other multi-unit service companies. A second approach is to study the performance of competitors. It is common practice for managers of service companies to make use of competitors' services with an incidental purpose of appraising quality. In addition, there are periodic special studies which follow generally the principles of market research.

The conventional array of ratios used in managerial and financial control carries hidden risks to service quality. For example, when the manufacturing industries undertook to automate, their traditional ratios of support personnel to production personnel became meaningless. In like manner, when a service company automates, efforts to hold a constant ratio between maintenance and production forces can result in deterioration of service. In like manner, improvements in other aspects of operating performance can affect quality of service as seen by the consumer. For example, in the hospital, the bed patient has traditionally called for service by pressing a call button

to which a nurse responded in person. The trend has been to centralize the response to these patient calls by directing them to a switchboard operator. The operator answers this call via a loudspeaker located behind the patient's bed. In turn, the patient makes his wants known to the operator via a microphone located 'somewhere' near his bed. The new system achieves some needed improvement in hospital manpower productivity, and may well reduce the 'access time' for the patient. However, some patients feel that the anonymous voice response represents a severe drop in well-being when compared with a response through the personal appearance of a nurse.

Measures of Service Quality

For internal conformance, the measures of quality have much in common with the well-known measures widely used in control of manufacturing processes. Measure of external conformance is more complex due to the abstract nature of some of the qualities and due to the subjective reactions of consumers.

An obvious source of data on external conformance is the cross-section of consumer complaints and claims, although many annoyed consumers will not take the trouble to complain. However, the complaints received do represent a sample of the types of annoyance to which all consumers are subject.

A second method of measure of external performance is through solicitation of consumer comments. A typical form of this is the appraisal card made available to consumers in hotel rooms and restaurants. Some companies use the summaries of these cards as the basis for a regular management report.

Additionally, some companies design special surveys of customer reaction, through letter questionnaires, telephone contacts and personal interview. The techniques used follow conventional market research practice.

Measures of service quality have to date been on an industry by industry basis, and this will continue for the foreseeable future.

Some service companies supplement their regular measures of quality by use of periodic audits. These audits are all-pervasive, covering both internal and external aspects of quality. As is common in formal audit plans, the service industry audit covers many incidents, observations, documents, etc. To reduce these findings to a simple score suitable for management reports (or for motivation plans) requires systems of summary, weighting, demerit values, ratings, etc...

Audit or review of the work of professional categories of personnel (e.g., researchers, physicians) runs into a special obstacle. These professional categories tend to feel that the review must be by a 'peer group', e.g., only physicians should review the work of physicians. When audit of such professional work is done by administrative personnel, the findings are not accepted wholeheartedly.

Organization for Quality

Service industry organization for quality differs considerably from that used by manufacturing industries. There are also extensive differences among the service industries themselves. However, in general, the service industry organization exhibits the following features:

1. The day to day regulation and decision making on conformance to standards are largely in the hands of the line departments, without the presence of independent inspection and test personnel who have powers to hold up the delivery of non-conforming 'product'.
2. The concept of a separate staff of specialists in quality control has only a minority acceptance.

3. The concept of a high level manager devoting full time to the quality function likewise has only minority acceptance. Where this organization form is used, the title of this manager is usually something other than Quality Manager.
4. Organized coordination of the quality function seldom exists in continuing form. For specific projects or crises, coordination may be set up through temporary committees of departmental heads.

The service industries' approach to organization for quality is adequate for establishing specifications and standards, for planning of day to day controls, and for executing those controls. In addition, their approach to coordination appears to be adequate for dealing with crises and with specific agreed-on projects. However, their organization forms do not appear to be well suited for programs of quality improvement, since:

- the concept of an organized approach to quality improvement has not been fully grasped
- their basic training in the nature of the quality function has been limited
- there is a lack of trained specialists to carry out the details of diagnosis for quality improvement.

Quality Improvement

The service industries abound in chronic quality problems, and thereby in opportunities for quality improvement. The general approach to such improvement, as used in some manufacturing companies, could also be used by most service industries. However, as noted above, the service industries are not well organized for quality improvement.

These weaknesses in organization form do not preclude quality improvements if top management provides the leadership. For example, the Howard Johnson restaurant chain has engaged in massive programs for improving quality through:

- 1 transferring most of the food processing to centralized factories, and
- 2 shifting from franchised restaurants to owned restaurants.

Additional improvement projects are the result of vendor initiative. Equipment manufacturers and materials suppliers are active in studying the problems of the service industries as a source of ideas for new equipment and materials which will improve productivity, quality, etc. Purchase of such new equipment usually involves substantial investments for the service company, and thereby requires the approval of top management.

Large service companies maintain a staff of full time technologists, particularly with respect to facilities and equipment. These technologists are active in studying ways to make improvements in productivity, quality, etc., through changes in facilities and equipment.

Where top management does not provide the leadership for quality improvement, the initiative, if any, must come from the middle management. However, in the absence of a manager devoted full time to the quality function, it is difficult and unusual for the line managers to evolve programs for quality improvement.

Study of Quality Costs

In manufacturing companies, study of quality costs is a fruitful technique for identifying promising projects and for proving their promise to upper management. This technique is applicable to the service industries, including the standardized quality cost categories.

While the quality cost concept is clearly applicable to the service industries, the published cases of

application have been too few to permit sound conclusions as to whether the potential benefits to the service industries would match those experienced by manufacturing industries.

Effect of Quality on Income

This is a most promising field of study. The most dramatic examples have involved improvement in competitive position through shortening the time required to render service. In some cases, existing companies have made use of Operations Research techniques for planning delivery operations amid a complex interrelationship of vehicles, drivers, customer needs, product types, alternative routes, delivery frequencies, etc. Aside from the effect on customer relations, these deliveries are a major factor in cost of service, e.g., in some industries, delivery costs run to about 20% of sales.

One way of translating service quality improvements into income is through making the sales contract contingent on prompt delivery. Such contract provisions, e.g., penalty clauses, give a competitive advantage to the service company which has the firmest grip on its delivery interval.

Motivation for Quality

To a considerable degree, the approaches to motivation used by manufacturing companies are applicable to the service industries. There is the same need for observing the principles and implications of self-control, controllability, sub-species of operator error, etc. However, the problems of quality motivation for non-supervisory employees exhibit some features which differ from those found in manufacturing industries:

- service employees have extensive direct contact with consumers, and can thereby directly affect the company's customer relations
- this same direct contact gives many service employees a prompt, useful feedback of the effect of their actions on fitness for use. This direct feedback is in sharp contrast to the 'meaningless' features of many factory jobs
- the fact that service employees do have extensive contacts with customers requires that the company develop the means of appraising the quality of this contact through sampling observation, customer feedback, etc.

Despite the manpower problems inherent in a labor intensive and (often) low wage industry, service companies have evolved ways of establishing successful motivational programs. Some of these are highly formalized, being based on a comprehensive system of data feedback. At the other extreme are the rather informal systems of employee rating, employee of the month award, etc.

Commonality in Service Industries

To discuss this commonality it is useful first to look sideways at the parallel problem of commonality in manufacturing industries. These industries differ remarkably in products, processes, materials and underlying technology. Despite such diversity, the manufacturing industries have evolved an extensive commonality in their approach to the quality function.

(A major reason for this evolution of commonality has been the traditional gregariousness of manufacturing managers, plus their willingness to participate in expositions, conferences, seminars, etc., and to contribute papers, discussions and exchanges of experience and ideas)

This evolution of commonality has been of great assistance to all manufacturing industries. As the universals have become identified, and as the case histories of application have been published, it has become possible to:

1. Understand the nature of the quality function as something universal, and distinct from the specialized technology of each industry.

2. Structure seminars and training programs related to these universals.
3. Develop quality specialists and quality managers who can make themselves effective in any manufacturing situation.

Individual service industries also hold expositions, conferences, etc., in which their executives and specialists participate. However, these are insular in nature, being oriented to the problems of that industry and not to the universal problems of the quality function. Conferences to deal with quality problems which are common to all service industries are a rarity. As a result, while all service industries are keenly aware of the need for quality, and have evolved programs specially suited to their respective needs, these programs are likewise insular, i.e., every industry on its own. There has to date been no significant movement to identify what are the common problems of service industry quality, and what are the common solutions.

Summary on Commonality

The manufacturing industries have based their commonality on:

- a universal elements of the managerial process, i.e., policies, objectives, plans, organization, manning, motivation, etc. These universals apply fully to the service industries.
- b universal parameters of quality (fitness for use). These have extensive application to service industries as well. However, the service industries make use of additional, important parameters, and these need to be studied in depth to evolve the universals which underlie them.
- c universal functional activities through which fitness for use is achieved: product development, manufacturing planning, vendor relations, process control, test, sale, use, field maintenance, feedback, etc. These activities are common to service industries as well, but with important differences in emphasis.
- d universal skills, tools and techniques. These have extensive application to the service industries, but it is likely that there will need to be some new inventions to meet the special problems of the service industries.

The service industries would be well advised to take steps to evolve the universals and commonalities which underlie quality of service. These steps would parallel those taken in the manufacturing industries:

Conferences, seminars and training courses on service quality, with attendance by managers and specialists from a variety of service industries. (When attendance is restricted to one industry, there arise inhibitions since competitors are asked to learn from each other. When attendance is from a variety of industries, these inhibitions are minimal).

A professional society which structures its activities around service industry quality.

Journals, books and other publications to exchange experiences and expound principles.

In all likelihood, all of these activities can be set up under the programs of existing institutions, without the need for creating new ones.

- 1) *Company is used here in a generic sense. It may include government departments and still other institutions created for service*

This article is derived from the more exhaustive analysis 'Quality Control in Service Industries' (by

J. M. Juran and R. S. Bingham Jr.) which constitutes Section 47 of the forthcoming Third Edition of Quality Control Handbook (J. M. Juran Editor) McGraw-Hill Book Co.

***Dr. J. M. JURAN**, Dean of American consultants on quality control, was a pioneer in the development of principles and methods for managing quality control programs. He is a veteran of over four decades of international experience in management at all levels. His clients have included industrial giants as well as small companies and government departments. He has conducted several hundred courses in all parts of the world, not only on QC management but on other managerial subjects as well. Dr. Juran is the author of ten books including 'Quality Planning and Analysis', (with F. M. Gryna), 'Managerial Breakthrough' and 'The Quality Control Handbook', which has been translated wholly or partly into several languages and which has become the international standard reference work in the field of QR. (1973)*