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**Evaluation of the Total Quality Healthcare Model**

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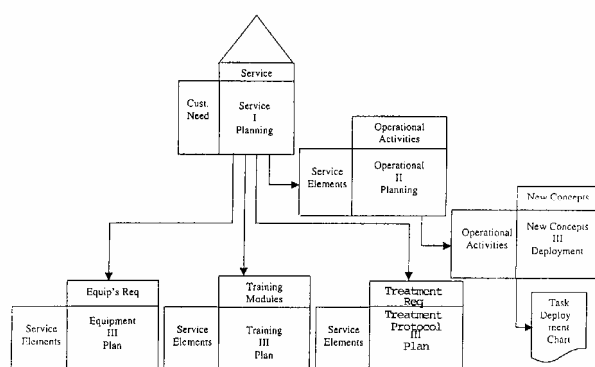
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## Abstract

Part II developed a total quality model based on the core principles of TQM using the quality function deployment (QFD) tool and in Part III, a 5-phase implementation framework was provided to support and sustain the implementation process of the proposed model. In this paper, case studies were conducted to validate the effectiveness of the proposed model and the implementation framework against real-life practices. The aim of validation is to test the model through case studies to identify its benefits as a communication and planning tool for continuous quality improvement (CQI) and total quality management (TQM) in healthcare.

## Introduction

Very often, it is the patients' perceptions of what makes a good hospital that matter in hospital services. However, understanding the expectations of patients is not an easy task for an industry that has always assumed it knows what the patients need. Furthermore, understanding how these patients' expectations are being met by existing management quality practices present an even more difficult problem. The traditional TQM theories by Deming, Juran and others have given pictures of TQM from different viewpoints. However, these traditional approaches to TQM can be categorised as 'the step-by-step approach' or 'a culture change route' and they represent a plethora of prescriptions which, whilst informative per se, do not provide a coherent and comprehensive set of actions. They are also inadequate in dealing with the unique organisational complexities inherent in hospitals. What is required in hospitals is a model or an implementation framework, which would recognise that hospitals are not mere apparatus but instead, a conceptualisation of human interactions working towards the achievement of overtly stated purpose. In view of these considerations, Part II developed a QFD-led total quality model (Figure 1) based on the three core principles of TQM, that is, customer-focus, teamwork and continuous improvement and Part III provided a 5-phase implementation framework with critical success factors and prescribed activities identified for each phase. One important feature of the proposed model is its ability to provide a map for the hospital to optimise aspects of its services that are of 'value' to customers so as to achieve the greatest competitive advantage. However, it is important to validate its effectiveness against real-life practices. The aim of validation is to test the model through case studies to identify its benefits as a communication and planning tool for CQI/TQM in healthcare.

**Figure 1: The Total Quality Healthcare Model**

Source: Developed by the Authors and the Focus Group Members. Modified from Hofmeister, 1995

## Background

Quality has become an increasingly important means of competition in the healthcare environment. Patients are becoming more demanding consumers. Hospitals, like all service companies have problems in defining quality, providing and controlling the desired levels of performance. In reviewing the literature, the authors found a number of differing definitions of quality:

- Product based - quality is defined as precise and measurable
- User based - quality is defined as fitness for intended use
- Value based - quality is defined in terms of costs and price

The definitions put forward by Crosby and Juran were found to be widely accepted, that is 'quality is fitness for use' (Juran, 1988) and 'quality is meeting requirements' (Crosby, 1979). However, in Singapore hospitals, these two definitions have no remarkable significance. There is in existence differing interpretations of the meaning of quality from one hospital to the other, from one employee to another. In one hospital, the authors identified four different definitions of quality:

1. To the medical staff - 'quality is about "curing", effectiveness of medical care, thoroughness and clinical outcomes'.
2. To the receptionists - 'quality is about how we attend to patients queries'.
3. To the Chief Executive - 'quality is low cost'.
4. To the Quality Manager - 'quality is about meeting every patients needs if possible. We can only try to provide the patient with what is medically advisable'. This means what the patient actually needs.

Hence, there exists a lack of a common definition of quality in Singapore hospitals. This finding is congruent to the study by Kogan, Henkel and Spink (1991) who noted that the lack of a common definition of quality is due to the

diverse professional groupings. This lack of a common definition of quality, in the authors' opinion, is one of the contributory barriers to meeting customers' expectations. Against this background, it is essential to delineate the quality expectations of customers because a lack of it would cause quality initiatives to lose a central focus on which to align all organisational members, hence the need to validate the effectiveness of the proposed total quality model as a planning and communication for understanding the customers' expectations, in performance measurement and in service planning. In the process, the effectiveness of the 'implementation' phase framework for the proposed model will also be validated.

## **The Methodology**

The methodology adopted for the case studies are as follows:

### **Data collection**

The authors did not have the luxury of choosing the hospitals to conduct the case studies and have to make-do with the three hospitals (restructured and private) that were willing to participate. Nevertheless, these three hospitals met the objectives in terms of suitability, feasibility and tactics (Schatzman and Strauss, 1993).

Having received the consent from the CEOs to serve as collaborators for the case studies, a decision was made to use the semi-structured interview format as one of the instruments of data collection.

Furthermore, with the approval of the CEOs, a focus group comprising of 10 persons including the CEO, doctors, medical and non-medical staff was formed at each hospital for data collection.

### **Interviews**

The authors undertook three series of allocated one-hour interviews at each hospital. The central theme of the initial interview was to obtain an overview of each hospital's management quality practices with particular focus on the background, aims and objectives. The second interview concentrated on the management quality activities/processes adopted and the reasons for its adoption. The last interview concentrated on the new and improved management quality activities/processes that have been made or would be made in the near future.

### **Focus group sessions**

The authors undertook 3 series of brainstorming sessions with each focus group. The first session, lasting the two allocated hours, identified the management quality activities/processes that hospitals should adopt to meet patients' expectations. Another two focus group sessions lasting 3 allocated hours were conducted to update the management quality activities/processes adopted and to complete the correlation matrix.

## Preliminary analysis

A questionnaire survey was carried out at 4 general practitioner's clinics and 2 specialist's clinics to determine patients' expectations and perceptions of Singapore hospitals' service quality. The findings (Table 1) revealed that the three most weighted service quality dimensions are Assurance, Responsiveness and Reliability. Furthermore, service quality is generally below patients' expectations as there are mean differences between patients' expectations and perceptions in all the statements and dimensions, which is a good indicator of service deficiency.

**Table 1: Mean Level of Patients' Expectations and Perception and Service Quality Gaps by Dimensions and Statements**

Statements	Expectation	Perception	Service Gaps
<b>Tangibility</b>	<b>4.16</b>	<b>3.75</b>	<b>-0.41</b>
1. Up-to-date and well-maintained facilities and equipment	4.38	3.87	-0.51
2. Clean and comfortable environment with good directional signs	4.21	3.89	-0.32
3. Doctors/staff should be neat and professional in appearance	4.13	3.96	-0.17
4. Informative brochures about services	3.70	3.39	-0.31
5. Privacy during treatment	4.40	3.65	-0.75
<b>Reliability</b>	<b>4.28</b>	<b>3.54</b>	<b>-0.74</b>
6. Services should be provided at appointed time	4.20	3.30	-0.90
7. Services should be carried out right the first time	4.31	3.65	-0.66
8. Doctors/staff should be professional and competent	4.56	3.71	-0.85
9. Error free and fast retrieval of documents	4.25	3.57	-0.68
10. Consistency of charges	4.10	3.47	-0.63
<b>Responsiveness</b>	<b>4.41</b>	<b>3.47</b>	<b>-0.94</b>
11. Patients should be given prompt services	4.29	3.41	-0.88
12. Responsive doctors/staff	4.51	3.62	-0.89
13. Attitude of doctors/staff should instil confidence in patients	4.48	3.72	-0.76
14. Waiting time of not more than 1 hour	4.35	3.12	-1.23
<b>Assurance</b>	<b>4.47</b>	<b>3.71</b>	<b>-0.76</b>
15. Friendly and courteous doctors/staff	4.26	3.72	-0.54
16. Doctors should possess a wide spectrum of knowledge	4.49	3.88	-0.61
17. Patients should be treated with dignity and respect	4.55	3.60	-0.95
18. Explain thoroughly medical condition to patients	4.58	3.62	-0.96
<b>Empathy</b>	<b>4.15</b>	<b>3.51</b>	<b>-0.64</b>
19. Obtain feedback from patients	4.02	3.38	-0.64
20. 24-hour service availability	3.71	3.52	-0.19
21. Doctors/staff should have patient's best interest at heart	4.47	3.57	0.90
22. Doctors/staff should understand the specific needs of patients	4.41	3.56	-0.85

Statements	Expectation	Perception	Service Gaps
<b>Accessibility &amp; Affordability</b>	<b>3.83</b>	<b>3.31</b>	<b>-0.52</b>
23. There should be adequate parking facilities	3.36	3.21	-0.15
24. The location should be easily accessible	3.94	3.46	-0.48
25. Affordable charges for services rendered	4.19	3.25	-0.94

Source: Compiled by Authors

A postal questionnaire survey was carried out to determine the understanding of top management in developing a TQM culture and the management quality practices in Singapore Hospitals. The findings of this survey were discussed in our paper, "TQM in Practice: A Singapore Healthcare Study". Based on the findings, interviews were conducted to determine the management quality activities/processes adopted by the hospitals.

## **Case studies - total quality healthcare model implementation**

The results of the questionnaire survey on patients' expectations and perceptions of hospital service quality revealed that service quality in all the three hospitals were poor/very poor and these hospitals have failed to meet the expectations of patients. In view of these results, the authors conducted three case studies to validate the effectiveness of Phase 1 (Service Planning) of the proposed model as a communication and planning tool to provide a map for the hospitals to optimise aspects of its services that are of 'value' to customers. The implementation framework involves the following steps:

### **Step 1: Identification of Customer Expectations**

This initial and most critical step involves identifying what customers want and expect from a hospital. For this paper, the term 'customer' refers to patients who have received medical treatment in the hospital in the past one year.

Several methods can be used to establish patients' expectations: structured or unstructured interview, questionnaires, observations, feedback, focused group discussions etc. Due to the complex nature of hospitals, it may be necessary to utilise a combination of methods.

### **Step 2: Establish Customers' Importance Ratings**

At any one time, it is unlikely that a hospital is able to meet all of its patients' expectations. It is therefore, necessary to systematically prioritise expectations that are to be met within a planning cycle. Towards this end, it is necessary to understand the relative importance that patients place on each expectation.

### **Step 3: Establish the Level of Performance for each Dimension of Customer Expectation against Main Competitors**

It is important to identify the expectations that have the ability to enhance the image of hospital services, and hence, improve customer satisfaction and market share. This step takes into account the patients' ideal level of performance, the hospital's improvement target and weights more heavily the quality factors that would improve market share. The absolute weights are then used to rank the expectations in order of significance.

### **Step 4: Identify the Management Quality Activities/Processes**

The design features that make up the service elements are similar for all the hospitals. However, the performance of each differs in terms of satisfying their patients and other customers. It is noted that management quality activities/processes do not represent solutions. Rather, each management

quality activity should be something that should be worked on in order to meet patient expectations, is measurable, is global in nature, and does not imply any specific design intent (Day, 1993).

It is not the intent of the total quality model to imply any design solution. Its purpose instead is to provide a series of management quality activities/processes that specify a generic design, which can respond to patients needs. The management quality activities/ processes determined for hospitals through the brainstorming sessions at the focus group meetings are classified under physical facilities, information facilities, service delivery and staff.

#### **Step 5: Correlate Customers' Expectations and Management Quality Activities/Processes**

This step establishes the relationship between the identified management quality activities/processes and the patients' expectations. Either a strong, moderate, low or no relationship is assigned to cells in the matrix. The overall importance values are then computed by multiplying the customer importance ratings with the value of the relationship matrix. These values indicate how important the service dimensions are to patients.

#### **Step 6: Prioritise Management Quality Activities/Processes**

As it is not possible to design and deliver a service package that contains every dimension of quality within a specific planning cycle, the aim of this step is to identify the feature(s) of the service package that could be realistically improved, given a set of constraints. First, the significance of the management quality activities/processes should be established. The correlation that appears under each management quality activity in the correlation matrix is to be multiplied by the absolute weights of patients' expectations and added together. Inclusion of the "absolute weights" computed for each expectation ensure that patients' preferences, improvement policy and perceived impact on revenue are all reflected in the significance computations.

#### **Step 7: Determine Areas Needing Improvement**

This step determines whether or not existing management quality activities/processes are meeting patients' expectations. If existing management quality activities/processes are meeting patients' expectations, there is no need to pursue process improvement or new process development. On the other hand, it highlights the patients' expectations that are not being met by existing management quality activities/processes. This provides the starting point for process improvement or new process development.

## Findings

### **A communication tool for understanding customers' expectations**

The case studies demonstrated that the proposed total quality is an effective communication tool for understanding customers' expectations. In Table 2, the authors made a comparison of the ranking derived from the empirical study on patients' expectations with the rankings obtained from the case studies. The left half of Table 2 is service attributes taken from the survey questionnaire (Table 1). On the right hand side is a reproduction of case studies rankings of service attributes.

Eyeballing Table 2, it can be seen that the importance rankings from the case studies do not coincide with that obtained from the patient survey. This confirms the authors' view that it is difficult to understand customers' expectations. Many a time, customers do not know exactly what they want. Although many attributes or quality dimensions may be positive to customers, the proposed total quality model is an excellent communication tool for identifying those quality attributes that are of most value and determine their preference patterns to obtain customer satisfaction and delight in an economic way.

### **A communication tool for performance measurement of hospitals**

The case studies demonstrated how hospitals could use the proposed model as a performance measurement instrument. According to Ghobadian, Speller and Jones (1994), service quality is a measure of how well the total service package meets the customers' expectations. The unmet patients' expectations identified were:

- informative brochures about services
- services provided at appointed time
- patients should be given prompt services
- waiting time of not more than 1 hour
- obtain feedback from patients
- 24-hour service availability
- adequate parking facilities
- location easily accessible
- affordable charges for services rendered

These unmet expectations represent 36% of the established patients' expectations. This explains why 40% of the respondents rated the service quality provided poor/very poor.

Additionally, the findings revealed the discrepancies in perception gap between what the hospitals felt the patients considered important, and what the patients actually believed was important. For example, managers felt that 'having patients' best interest at heart' was very important, whilst patients' felt was quite important. Also, some activities like 'excellent housekeeping' and



'frequency of facilities maintenance' were deemed necessary by management but viewed as unimportant by patients.

**Table 2: Patient Survey Rankings and Total Quality Model Rankings of Patients' Expectations**

Patient Survey Ranking	Expectation Statements	QFD Ranking
<b>V</b>	<b>Tangibility</b>	<b>IV</b>
16	Up-to-date and well-maintained facilities and equipment	11
16	Clean and comfortable environment with good directional signs	3
19	Doctors/staff should be neat and professional in appearance	20
25	Informative brochures about services	4
5	Privacy during treatment	22
<b>III</b>	<b>Reliability</b>	<b>V</b>
11	Services should be provided at appointed time	1
6	Services should be carried out right the first time	21
4	Doctors/Staff should be professional and competent	23
11	Error free and fast retrieval of documentation	15
23	Consistency of charges	18
<b>II</b>	<b>Responsiveness</b>	<b>III</b>
11	Patients should be given prompt services	10
9	Responsive doctors/staff	6
3	Attitude of doctors/staff should instil confidence in patients	9
11	Waiting time of not more than 1 hour	16
<b>I</b>	<b>Assurance</b>	<b>I</b>
11	Friendly and courteous doctors/staff	13
1	Doctors should possess a wide spectrum of knowledge	14
7	Patients should be treated with dignity and respect	1
2	Explain thoroughly medical condition to patients	8
<b>IV</b>	<b>Empathy</b>	<b>II</b>
16	Obtain feedback from patients	17
22	24-hour service availability	12

7	Doctors/staff should have patient's best interest at heart	7
9	Doctors/staff should understand the specific needs of patients	5
<b>VI</b>	<b>Accessibility and Affordability</b>	<b>VI</b>
24	There should be adequate parking facilities	24
20	The location should be easily accessible	19
21	Affordable charges for services rendered	25

Source: Compiled by the Authors

The case studies demonstrated that the proposed total quality model provides an overview of a hospital at a given time. It provides information on the strengths and weaknesses of the hospital and identifies the unmet expectations of customers. In this context, it is an excellent communication tool for performing performance measurement that is, assessing existing management quality activities/ processes to identify unmet customers' expectations.

### **A communication and planning tool for service planning in hospitals**

Given the highly personalised nature of services in hospitals, great attention should thus be paid to its delivery. The case studies demonstrated that the proposed total quality model would enable hospitals to optimise aspects of its services that are of 'value' to customers so as to achieve the greatest competitive advantage.

The three most important quality dimensions identified were:

1. Assurance
2. Empathy
3. Responsiveness

These important service dimensions were chosen based on their high overall importance values. The results show that patients focus their expectations on the 'how it is done'. This finding is congruent to the studies by Ware et al (1983), Yi (1990), Koch (1991), Oliver (1993) and Jayanti (1993).

The significant management quality activities/ processes identified were:

1. Staffing which includes degree of attentiveness, degree of friendliness, use of respectful terms in addressing patients, knowledge of staff, degree of staff cleanliness and service response speed.
2. Service delivery which includes appointment system, quick registration, patient escorted to treatment area, feedback system, 24-hours service availability, one-stop service availability, schedule for continuity,

protocol of treatment, patients informed of length of treatment, computerised on-line information and doctor-to-bed ratio.

Furthermore, to determine which areas needed improvement, benchmarking analysis was performed amongst the three hospitals based on the level of customer satisfaction. In this context, Hospital A was the highest rated hospital, followed closely by Hospital B whilst Hospital C overall quality was the lowest. Since, Hospital C is weakest in the service dimension of Responsiveness, which is the third most important dimension for patients; it has to determine the management quality activities/processes that should be improved. In this case, service delivery and staffing are areas that need to be improved in order to attain higher customer satisfaction for the Responsiveness dimension.

The case studies demonstrated that the proposed total quality model provides managerial implications for service planning. CEOs and doctors of hospitals clearly need to pay attention to satisfaction issues in general, something which they have been hesitant to do. For instance, hospitals rarely conduct patient satisfaction and feedback studies. Also, since patients focused their expectations on the functional aspects of quality, particular attention should be paid to 'doctor-patient' relationship and 'staff-patient' relationship, staffing and service delivery activities/ processes. In this context, the proposed model is an excellent communication and planning tool for service planning in hospitals

### **Benefits of the proposed total quality model**

Through the 3 case studies, the effectiveness of the proposed model as a communication and planning tool for CQI/TQM in hospitals was validated. The benefits highlighted were:

Translates customer needs into appropriate service quality specifications. This is the main benefit of the proposed model. Prior to using the model, hospitals can only identify their customers and what their needs are. With the use of the proposed model, hospitals not only are able to identify customers' needs; they can also determine management quality activities/ processes that can meet customer needs. Due to the intense competition and changes in healthcare demand, satisfying and exceeding customer needs are very important.

- Clarifies customer priorities for competitive advantage. As hospitals are not able to meet all of their customer needs at the same time, the proposed model can help by prioritising the customer needs. This ensures that valuable resources are allocated to the most worthwhile areas for improvement.
- Helps hospitals to think in terms of the entire system and not just isolated management quality activities/processes or isolated customer needs. The model combines individual strengths in order to gain system-wide and cross-departmental objectives.

- Gives direction for improvement in service quality. It can identify areas and management quality activities/processes that need to be improved and the priority for attending to those areas or activities/processes.
- Improves communication between departments and helps develop the concept of teamwork. As mentioned earlier, the model works for the betterment of the entire system and as modern theories of management amply demonstrate, teamwork is a very important ingredient for ensuring competitive success.
- Monitors and traces changes in customer satisfaction and importance of service quality. It can detect changes in dynamic customer needs.
- Helps hospitals to benchmark themselves against competitors. Benchmarking is useful in realising an organisation's strengths and weaknesses. To more effectively position itself in the marketplace, a hospital may emphasise certain service strengths, or downplay other aspects in which competitors perform more competently.

## Conclusions

Analysing the results from the case studies provides evidence that the proposed model not only enables a hospital to identify and prioritise customers' expectations; it is capable of identifying the unmet expectations of customers and provides a map for optimising aspects of services that are of 'value' to customers. This proved that the proposed model and its implementation framework are a practical communication and planning model for implementing TQM in hospitals.

However, for the QFD-led model to be effective and applicable, training must be conducted continuously at every stage of the implementation process. The basic philosophy is to use the proposed model as a means to an end rather than an end in itself. However, it is essential to determine the responsibility and the roles of key functionaries to avoid conflict of interests, to have operative leadership and to have dedicated leaders for long-term strategic planning, training and quality improvement.

The provision of the proposed model is consistent with Black's doctoral thesis that a scientifically derived model for the implementation of TQM is required (Black, 1993). However, any model that lays claim to providing a pathway for TQM should be tested under operating conditions. From the case studies, the author has tested under operating conditions Phase 1 of the proposed model and Step 1 to Step 7 of the implementation phase framework, that is, beginning with the identification of customer needs to determining areas needing improvement. Future research is required to test Phase II (Operational Planning) and Phase III (Equipment Plan, Training Plan, Treatment Protocol Plan and New Concepts Deployment Plan) of the proposed model. This would provide information on how the hospital's operations has improved after acting on patients' responses and the effectiveness of the proposed model to take the hospital towards the future state, the state of continuous quality improvement, thus achieving total quality healthcare.

Furthermore, future research to be conducted by applying the proposed model to other kinds of health services, such as medical clinics, clinical laboratories and also the government health service ministry. Lastly, it would also be helpful to conduct the same study in hospitals of other countries. Such studies would enable inter-country comparison to be made.

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