

Health Care Service Quality: Case Example of a Hospital with Lean Implementation

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Abstract. The purpose of this paper is to measure service quality of the hospital implementing Lean management. This paper assesses patients' expectation and satisfaction pertaining to hospital service quality. Data collected from 450 patients are analyzed by using the SERVQUAL model. The model compares patients' perception and expectation of service received across five dimensions of service quality including reliability, responsiveness, assurance, empathy and tangibility. The results of this study reveal that overall service quality score is positive, however, there is no significantly different between overall patients' perception and expectation. The service quality level of the hospital implementing lean is moderate; the hospital is able to deliver service as expected. In addition, the largest positive gap between patients' perception and expectation is in term of tangibility. The largest negative gap is with respect to assurance. The findings help the management team to understand areas of improvement. Top management can apply research findings to design and prioritize hospital strategies for improving service quality.

Keywords: Hospitals, lean management, service quality, SERVQUAL, health care.

1. Introduction

Service quality becomes increasingly important for today's business, particularly in high-customer involvement industries such as healthcare and financial services. It could be considered as an imperative strategy that helps a company to attain a competitive advantage, in turn increasing long-term profitability. Service quality is a crucial direction for enhancing business performance, which underlies the widespread adoption of quality improvement initiatives in many service industries [1]. Service quality improvement for achieving customer expectations and satisfaction has become a major challenge for services industries.

Health care is a rapidly growing sector which has gained much attention from researchers and practitioners worldwide. Due to tremendously increasing cost, many hospitals attempt to adopt quality initiatives such as lean and/or Six Sigma to improve their service operations. Implementing such process improvement efficiently and effectively would ultimately help in delivering the highest value to customers. In a globally competitive world, hospitals that can successfully implement an appropriate business process improvement tend to gain a significant competitive advantage. This leads to questions related to 'what' and 'how' quality initiatives should be implemented to improve the overall service quality and customer satisfaction. Lean management concept, originated from Toyota Production Systems, has become of interest to the services sector. To date, many health care service organizations have adopted Lean concept with an aim of eliminating waste, thereby creating value of service delivered to the end customers. Thus, it is vital that the organization understand the way in which quality initiatives help enhance all dimensions of service quality. This calls for empirical research to provide a greater understanding of how lean implementation help improve the service quality. It is therefore crucial that management team is able to measure the service

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quality provided by the hospital. Considering the main stream of service quality research, SERVQUAL is deemed appropriate in measuring quality of health care services.

Hence, the purpose of this study is to measure service quality of hospitals implementing Lean by using the SERVQUAL model. One health care service organization in Thailand is selected as a case example. This hospital is chosen as they received Thailand Lean Award in the year of 2010 and have conducted more than 350 successful lean projects. Previous studies lack of assessing service quality in hospital with lean implementation. The application of SERVQUAL technique in evaluating service quality in hospitals is still limited. Hence, this paper contributes to a growing body of research into lean implementation within service organization by presenting an Asian perspective in service organizations in the health care industry. This paper is organized as follows. The following section presents a literature review of service quality, particularly in the health care services. In Section 3, the research methodology is described. Research findings are discussed in Section 4. The conclusion and future research are provided in the final section.

2. Literature Review

2.1 Service Quality in Health Care

Service Quality (SERVQUAL) aims to understand how customers perceive the quality of a service. An instrument (a survey questionnaire) is used to compare what they feel the service firm should offer, i.e. expectation, and their perceptions of the performance of the actual service [2]. The SERVQUAL instrument has been refined and developed into a multiple-item scale for assessing consumer perceptions of service quality [2,3]. The items in SERVQUAL are grouped into five distinct dimensions including:

| | |
|-----------------|--|
| Reliability: | Ability to perform the promised service dependably and accurately |
| Responsiveness: | Willingness to help customers and provide prompt service |
| Assurance: | Knowledge and courtesy of employees and their ability |
| Empathy: | Caring, individualized attention the firm provides for its customers |
| Tangibility: | Physical facilities, equipment, and appearance of personnel |

SERVQUAL provides a broad range of application through its expectations/perceptions format, and it is widely used within the service sector to understand the perceptions of targeted customers regarding their service needs; and to provide a measurement of the service quality of the organization.

Considering health care service organization, a number of studies were conducted to measure service quality. Youssef et al. [4] assessed service quality in the National Health Service (NHS), UK hospitals. Lim and Tang [5] evaluated patients' expectations and satisfactions in hospitals in Singapore. Taner and Antony [6] examined the differences in service quality between public and private hospitals in Turkey; results indicated that inpatients in private hospitals were more satisfied with service quality than those in public hospitals. Service quality between public and private hospitals in Cyprus was compared; results showed that private hospitals had smaller gaps than public hospitals in all service quality dimensions [7].

2.2 Health Care Service Organization with Lean Implementation

James Womack and his team presented how to apply lean thinking to health care along with case example of Seattle's Virginia Mason Medical Center that successfully implemented lean thinking [8, 9]. Zidel [10] introduced lean principles, basic lean tools, and applications of these tools for health care setting. Moreover, lean management was implemented in several departments in hospitals [11-12]. Grove et al. [13] provided challenges faces during lean implementation from UK hospitals. More details about lean concepts in hospitals setting can be seen at Graban [14].

3. Research Methodology

3.1 Survey Instrument and Data Collection

Based on the literature review addressed in the previous section, measures of service quality constructs were determined by using the study of Youssef et al. [4] and Lim and Tang [5]. The main reason is that these studies evaluated health care service quality. The final version of survey instrument was modified from the study of Youssef et al. [4] and Lim and Tang [5]. The survey consisted of 24 items that

were classified into 5 constructs: tangibility (4 items), reliability (5 items), responsiveness (5 items), assurance (5 items), and empathy (5 items). The survey contains an “expectation” section with 24 statements and a “perception” section consisting of a set of matching statements. One academic and two practitioners helped in refining the survey instrument for this study. A five-point Likert scale was used to ask respondents for scoring (items) ranging from 1 = strongly disagree to 5 = strongly agree.

This study was conducted at one hospital located in southern part of Thailand. The hospital is a teaching hospital providing training in undergraduate, graduate, and postgraduate level. The hospital with more than 850 beds provides tertiary level outpatient and inpatient service. This hospital has adopted the lean management concept, one of the quality initiatives, to improve the hospital service since 2008. More than 350 of successful lean projects were conducted in this hospital. In the year of 2010, this hospital received the Thailand Lean Award.

Considering the purpose of the exploratory study, the convenience sampling method was used to collect data. A total of 450 survey questionnaires were randomly distributed to patients who presented at the outpatients’ clinic at during February-March 2011. The number of satisfactorily completed questionnaires returned was 450. Therefore, the overall response rate is 100 %.

3.2 Reliability and Validity of the Survey Instrument

The internal consistency of measures used in this study is verified by considering Cronbach alpha; a value greater than 0.7 is generally considered acceptable. The Cronbach’s alpha of all service dimensions were calculated to test the reliability of the scale used in the study. The result shows that the reliability coefficients were acceptable for all following constructs: tangibility, reliability, responsiveness, assurance, and empathy.

3.3 Statistical Analysis

The SERVQUAL scale was used to evaluate hospital service. The obtained data were analyzed with SPSS for Window 17.0 software. Data were tested by using statistical inference; the paired t-test was conducted to determine whether there were differences between the overall means. The SERVQUAL score was calculated to evaluate perceived service and expected service with respect to the following measures: tangibility, reliability, responsiveness, assurance, and empathy. The SERVQUAL scores of each service dimension were obtained by calculating the difference between the perceived and expected service scores.

$$\text{SERVQUAL score} = \text{Perception score} - \text{Expectation score}$$

The positive scores mean that patients’ expectations have met and their perceptions of hospital services are good. The negative scores indicate that patients’ expectations have not been met and their perceptions of hospital services are poor.

4. Findings and Discussion

The results of health care service quality are obtained. The overall mean level of patients’ expectation and satisfaction and service gaps in hospital with lean implementation is shown in Table I. Results show that patients’ perception are higher than patients’ expectation in all dimensions implying that the hospital delivered service as expected. Data are tested with the paired t-test to examine the hypothesis that z values of all the dimensions fell in the critical region (2 tailed sig.). We fail to reject the null hypothesis that there are no differences between the mean. We conclude that there are no differences between patients’ perception and expectation overall. The service level is moderate.

Table 2 depicts service quality gap for each dimension, which is an indicator for service deficiency. The top three service dimensions from patients’ expectation are reliability, tangibility, and assurance. The top three dimensions from patients’ perception are tangibility, reliability, and empathy. These findings suggest that patients strongly expect to receive reliable service from hospital, for example, physician and staffs are professional and competent; services are provided right at the first time; documents are error free and properly recorded; etc. However, patients perceived that they really received good service from the hospital in term of tangibility, for example, facilities and equipment are well-maintained; patients notice cleanliness and comfortable environment with good directional signs; physicians and staffs are neat and professional in appearance; hospital provides informative brochures about services, etc. This could be because the hospital

has continuously applied 5S and visual control, powerful lean tools, to reduce wastes in operating process and to visualize the flow of service; these actions potentially led to satisfactory environment in the hospital.

TABLE 1
OVERALL MEAN LEVEL OF PATIENTS' EXPECTATIONS AND PATIENTS' SATISFACTION
AND SERVICE GAP IN HOSPITAL WITH LEAN IMPLEMENTATON

| Gap 5 | N | Mean | Std. Deviation | t | Sig.(2-tailed) |
|-------------|-----|--------|----------------|-------|----------------|
| P-E | 450 | 0.0224 | 0.73024 | 0.646 | 0.518 |
| Perception | 450 | 3.6288 | 0.86461 | | |
| Expectation | 450 | 3.6066 | 0.55115 | | |

TABLE 2
MEAN LEVEL OF PATIENTS' EXPECTATIONS AND PATIENTS' SATISFACTION
AND SERVICE GAPS IN HOSPITAL WITH LEAN IMPLEMENTATON

| Service Quality Dimension | Mean | Std. Deviation | t | Sig.(2-tailed) | Service Quality Level |
|--|---------|----------------|--------|----------------|-----------------------|
| TangibilityP - TangibilityE | 0.2561 | 0.72965 | 7.446 | 0.000* | High |
| TangibilityP | 3.9183 | 0.74235 | | | |
| TangibilityE | 3.6622 | 0.59045 | | | |
| ReliabilityP - ReliabilityE | 0.0662 | 0.89351 | 1.572 | 0.117 | Moderate |
| ReliabilityP | 3.7782 | 0.91888 | | | |
| ReliabilityE | 3.7120 | 0.58435 | | | |
| ResponsivenessP - ResponsivenessE | -0.0524 | 0.83247 | -1.336 | 0.182 | Moderate |
| ResponsivenessP | 3.3538 | 1.07914 | | | |
| ResponsivnessE | 3.4062 | 0.71892 | | | |
| AssuranceP - AssuranceE | -0.0960 | 0.85106 | -2.393 | 0.017* | Low |
| AssuranceP | 3.5036 | 0.99174 | | | |
| AssuranceE | 3.5996 | 0.65277 | | | |
| EmpathyP - EmpathyE | -0.0626 | 0.78271 | -1.698 | 0.090 | Moderate |
| EmpathyP | 3.5902 | 0.92136 | | | |
| EmpathyE | 3.6529 | 0.66551 | | | |

*Significant level <0.05

The statistical results also indicate that the current service quality level in term of tangibility is high whereas the service quality of the assurance dimension is low. The service quality with regard to reliability, responsiveness, and empathy is considered moderate level. To gain more insight, the gap between perception and expectation was analyzed; results show that the largest gap between patients' perception and patients' expectation is in term of tangibility; the gap is significantly different. This means that hospital considerably delivered good service in term of tangibility more than expected. Patients perceived clean equipment and facilities and equipments in the hospital with comfortable environments. Patients also perceived good service in term of reliability. On the contrary, results reported the negative gap in terms of assurance, empathy and responsiveness. Particularly, patients significantly had higher expectation than perception in term of assurance. This provides an important implication for top management in paying attention to these three negative gaps with an aim of improving the quality of service delivered to patients, particularly the assurance dimension. Also, these information help management team make a decision regarding the best use of

company resources in delivering the highly valued service. It is noted that the statistical result is an initial guideline that help identify the potential service quality improvement areas. Further investigation is, however, suggested to provide management team with constructive information in selecting an appropriate improvement initiative.

5. Conclusion

This paper measures service quality of hospital with lean management by using the SERVQUAL model. A case example of the hospital with lean implementation in Thailand is explored. The 450 questionnaires survey was conducted. Findings shows that service quality level of this hospital with lean management concept is moderate. Overall, patients' perception is slightly higher than patients' expectation; however, the gap between perception and expectation is not significantly different. The highest service quality dimension of patients' expectation is reliability. The highest service quality dimension of patients' perception is tangibility. The key finding also indicates that reliability and tangibility are two most important dimensions of hospital service quality perceived by patients; whereas the assurance was found having the largest negative gap. In summary, this study helps identify the quality of service provided by the hospital implemented lean management concept as an improvement initiative. The results provide a managerial implication in continuously improving the service quality thereby enhancing customer satisfaction.

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7. References

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