

Improving Hospital Profitability through Cost of Quality

(Case Study: VIP Nursing Care Unit, Stella Maris Hospital, Makassar, Indonesia)

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Abstract

The Stella Maris Hospital of Makassar, Indonesia has made various efforts in improving the quality of services to maximize profitability through the increasing of market share and cost containment. The financial cash flow within the year 2008-2010 indicates that the operating costs increased which is in contrast to the rate of bed utilization that decreased for the same period, that subsequently give impact to profitability. This paper is intended to analyze the relationship between cost of quality with profitability. The result indicates that the cost of quality has a significant relationship to the profitability. Partially, prevention and appraisal cost have a significant relationship to improve profitability, while the external failure costs have a significant relationship to lower profitability. Internal failure costs, on the other hand, have no significant relationship to the profitability. In conclusion, improving the allocation of prevention and appraisal costs will subsequently increase the profitability.

Keywords: cost of quality, prevention costs, appraisal costs, internal failure costs, external failure costs, and profitability.

1. Introduction

Increasing competition in the manufacturing and service industry requires companies to give more attention to the quality of products and services produced, so as to survive in a dynamics competitive environment. Quality improvement can be done by improving the quality of processes and products or services as it is one of the key strategic objectives in the Balanced Scorecard concept (Norton and Kaplan, 2008). Improving the quality of products or services will increase customer satisfaction and market share and subsequently increasing market share will have implications for revenue growth. Thus, companies need to implement continuous quality improvement efforts by controlling the cost arisen through measurement of the cost of quality.

Many companies promote quality as the central customer value and consider it to be a critical success factor for achieving competitiveness. Any serious attempt to improve quality must take into account the costs associated with achieving quality since the objective of continuous improvement programs is not only to meet customer requirements, but also to do it at the lowest cost. This can only happen by reducing the costs needed to achieve quality, and the reduction of these costs is only possible if they are identified and measured. Therefore, measuring and reporting the cost of quality (COQ) should be considered an important issue for the companies.

Although the cost of quality (COQ) has been a well known concept for many years, but there is no general agreement on a single broad definition of quality costs (Machowski and Dale, 1998). The cost of quality is usually understood as the sum of conformance plus non-conformance costs. Cost of conformance is the price paid for prevention of poor quality (inspection and quality appraisal). Cost of non-conformance is the cost of poor quality caused by product and service failure (rework and returns). According to Purgslove and Dale (1995), it is now widely accepted that quality costs are the cost incurred in the design, implementation, operation and maintenance of a quality management system, the cost of resources committed to continuous improvement, the cost of system, product and service failures, and all other necessary costs and non-value added activities required to achieve a quality product or service.

Campanella, Jack, et. al. (1990) and ASQC (1970), recognized four categories of quality costs namely: (1) prevention cost; (2) appraisal cost; (3) internal failure cost; and (4) external failure cost. The definition of each category is describes as follows;

Prevention costs are “the costs of all activities specifically designed to prevent poor quality in products and services”. This is a proactive approach to defect prevention rather than defect correction and removes the idea of quality efforts essentially being reactive in efforts to “put out fires”. Prevention expenses can be recovered many times over through reduced appraisal and failure costs.

Appraisal costs are “the costs associated with measuring, evaluating, and auditing products or services to assure conformance to quality standards and performance requirements”. Appraisal techniques are used for the verification and validation. These techniques help organization to increase the quality with lower cost.

Internal failure costs are “the costs resulting from products or services not conforming to requirements or customer/user needs (which) occur prior to delivery or shipment to the customer”.

External failure costs are “the costs resulting from products or services that not conforming to requirements or customer/user needs which occur after delivery or shipment of the product, and during or after furnishing of a service to the customer”. External failure can include loss of failure business through customer dissatisfaction.

There are also correlation between the maturity of a quality system and the distribution of quality costs. Some studies have been conducted to determine the actual effectiveness of COQ systems and the degree of maturity, and total costs model relates the distribution cos of quality to the maturity of the quality system (Juran, J.M., Gryna, F.M. and Bingham, R., 1975), as shown in Table 1.

Table 1. Conceptual Model of Relative COQ Expenditures Versus Quality System Maturity Level.

Maturity Level					
	1	2	3	4	5
Prevention	Very low	Low	Moderate	High	Very high
Appraisal	Low	Low-Moderate	Moderate	Low-Moderate	Low
Int failure	High	Very high	Moderate-high	Low-Moderate	Very low
Ext failure	High	High	Moderate	Low	Very low
Total COQ	High	Very high	Moderate-high	Low-Moderate	Low

Source: Sower, V.E., Quarles, R., Broussard, E. (2007)

The Stella Maris Hospital of Makassar, in particular, has developed VIP treatment unit as one profit center with services focusing on middle to upper segments of the economy. In fact, the purpose of the VIP treatment unit development is not only to improve the profitability of the hospital to cover all operational and maintenance costs but also to subsidize poor patients as the commitment and implementation of the hospital missions. In conducting the service, variety quality improvement programs have been conducted to support the hospital profitability through the improvement of market share and operational cost efficiency. However, in the year 2008-2010, VIP treatment unit operating costs increased by 15.7% annually. Conversely, the bed utilization rate decreased by 3.59% each year, so a such contradictory trend has given impact to the profitability of the VIP treatment unit as one of the profit centers at Stella Maris Hospital of Makassar.

Based on these phenomenon, is important to analyze the quality cost of the profitability of the VIP Care Unit at Stella Maris Hospital of Makassar. The main purpose of this study is to calculate and analyze the cost of quality (prevention costs, appraisal costs, internal failure costs and external failure costs) and the level of profitability to identify the variable costs that have a significant relationship to the profitability of the VIP treatment unit so that it can provide inputs related to the allocation and control of the quality costs.

2. Research Method

The research was carried out at the VIP Nursing Care Unit at Stella Maris Hospital of Makassar, between April and May 2011.

The research used in this study was descriptive analytic using retrospective study design and quantitative approach. The variables in this study consisted of 2 (two) groups, the independent variables and the dependent variable. Independent variables consist of the cost of prevention (X1), the cost of assessment (X2), internal failure costs (X3), and external failure costs (X4), while the dependent variable in this study is the profitability (Y).

The data was collected by examining and assessing some documents related to the research topic, namely the operational cost data, annual reports, and implementation of hospital rates. In addition, the interview method was also used to assist the identification of the hidden cost to equip the data that was not obtained during documentation process. Interviews were also conducted to the heads of the related surgery units and heads of inpatient unit within the hospital.

The scope of the data in this study comprised the financial structure of the VIP care unit consisting of actual costs, hidden costs, and estimated profitability. Sampling technique used was a census technique related to monthly operating costs and profitability of the VIP care unit of Stella Maris Hospital of Makassar during the period of 2008-2010, where the number of samples were 36 months (n = 36).

3. Results and Discussions

The concept of Balanced Scorecard in the customer's perspective described that service quality will increase customer satisfaction that subsequently will support the acquisition and retention so that it will also increase the market share that ultimately will affect the profitability as illustrated in figure 1 (Norton and Kaplan, 2008). From the perspective of cost, the concept of quality cost considers that the service quality requires the allocation for cost of control (prevention and appraisal) and failure costs (internal and external) efficiently, thus increasing profitability (Foord K., 2004).

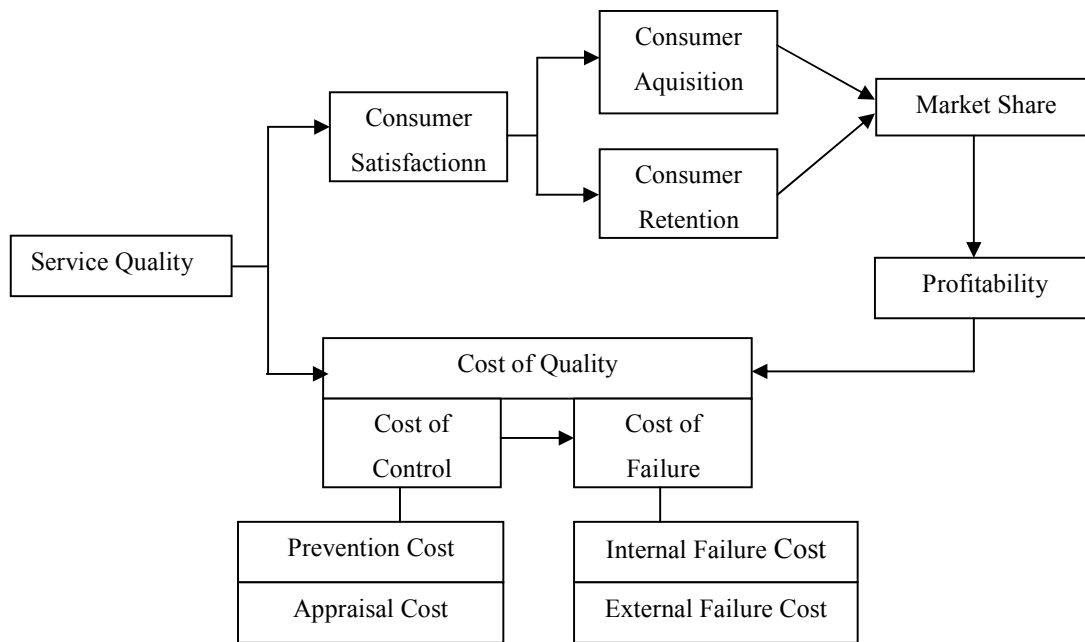


Figure 1. Theoretical Framework

The analysis of the profitability of the unit cost of quality care is carried out by measuring the profitability VIP care units and components of quality cost, which consists of prevention costs, appraisal costs, internal failure costs and external failure costs. The conceptual framework of this study is illustrated in figure 2.

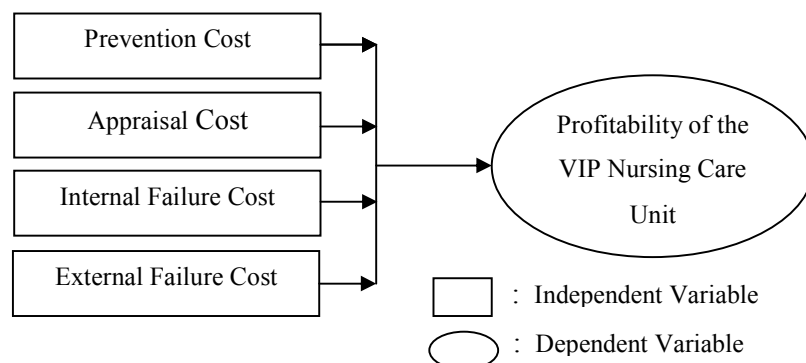


Figure 2. Conceptual Framework

3.1. Cost of Quality

Cost of quality is the cost associated with the prevention, identification, improvement of low (bad) quality products or do not meet customer needs and the opportunity cost of time lost of production and sales. Cost of quality includes 4 (four) groups of costs, i.e., prevention costs, appraisal costs, internal failure costs, and costs of failure external (Campanella, Jack, et. al. 1990). The cost of quality of Stella Maris Hospital during 2008 – 2010 is presented in figure 3.

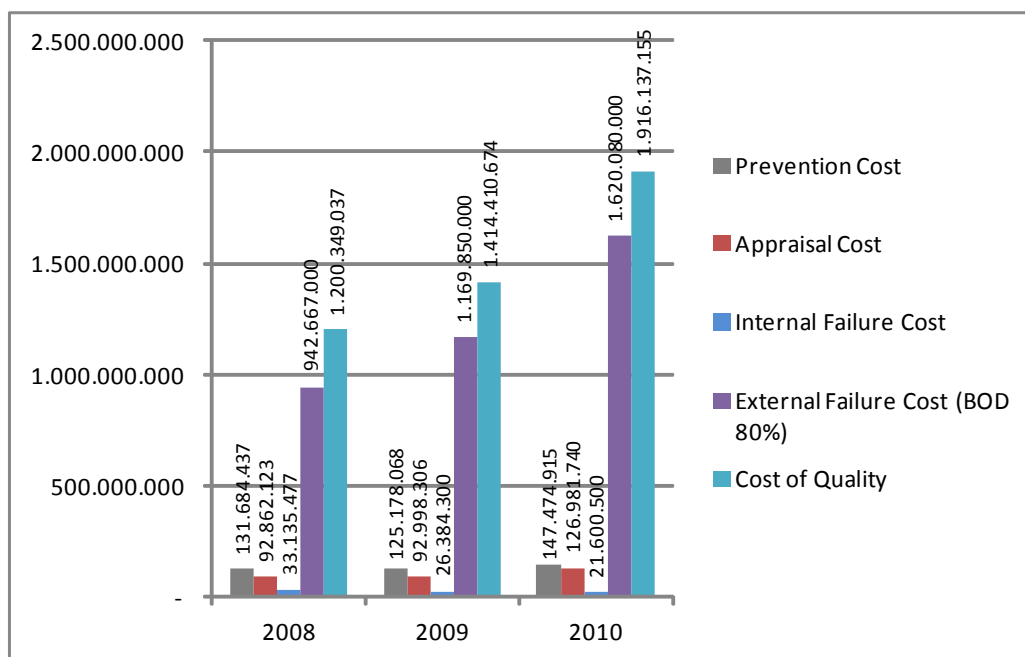


Figure 3. The cost of quality within the year period of 2008 to 2010

Based on the statistical F test, it was shown that prevention costs, appraisal costs, internal failure costs and external failure costs linked to the profitability simultaneously. It can be seen from the value of R Square of 0.914 or in other words, Stella Maris Hospital profitability of 91.4% determined by the cost of prevention, appraisal costs, internal failure costs and external failure costs, while the remaining 8.6% is determined by other factors beyond the cost of quality is not examined in this study.

Partial relationship between each cost of quality components with profitability is illustrated in table 2, and will be further elaborated in the following sections.

Table 2. Paired T-Test of Profitability Correlation

Variables	Profitability Correlation	Significant Level
Prevention Cost (X1)	0,521	0,001
Appraisal Cost (X2)	0,716	0,000
Internal Failure Cost (X3)	0,063	0,715
External Failure Cost (X4)	-0,475	0,003

Source: Primary Data

3.2. Prevention costs

Prevention costs are costs incurred as a result of efforts to prevent poor quality of services rendered. It is intended to maintain and improve the quality of service to consumers (Foord K., 2004). In this study, the costs of prevention include the cost of quality planning and nursing care, the cost of human resource training, and facility maintenance of care units. As can

be seen from Figure 3, the cost of prevention in the periods of 2008-2009 decreased by 4.94% from 131 million IDR to 125 million IDR. In the periods of 2009-2010, on the other hand, the prevention cost increased up to 17.81% from 125 million IDR to 147 million IDR. The decrease in the prevention cost is also followed by a decrease of 0.27% in failure costs both internal and external in the periods of 2008-2009, and a further decrease of 34.79% in 2010. This indicated that during the years of 2008-2010, Stella Maris Hospital has tried to fix the quality of the VIP nursing care unit through the allocation of quality cost as a part of prevention cost.

As shown in table 2, the analysis results showed that prevention cost has a significant effect on profitability at level of 0.001. Partial correlation coefficients of the cost of prevention with a value of 0.521 have a positive direction. This value means that the rising costs of prevention will be followed by improved profitability significantly. In this case, the Stella Maris Hospital still needs to further enhance its prevention cost allocation to maximize the profitability of VIP nursing care unit as indicated by the regression correlation. This finding is in a good agreement with Hansen & Mowen (2006) stating that the prevention cost and appraisal cost are part of control costs intended to prevent increasing of bad impact resulted from poor product/service quality delivered to customers through minimizing the cost occurred from the failure.

Previous research carried out by Rahmat and Amalia (2007), also found that the increase of budget allocation for prevention and appraisal costs of hospital will reduce the cost occurred caused by external and internal failures. Therefore, it is necessary for the Stella Maris Hospital to increase the allocation of prevention to maximize the profitability of VIP nursing care unit. Under optimum allocation, the prevention cost could minimize the occurrence of failure cost which subsequently increase the profitability. This is inline with Hansen and Mowen (2006) that stated that cost efficiency will increase profitability.

This thought is also consistent with Balanced Scorecard hierarchical logic (Norton and Kaplan, 2008) stating that the improvement of growth and learning will increase the quality of internal process that may have impact to consumer satisfaction and ultimately will influence profitability. The prevention efforts that need to be done by Stella Maris Hospital includes the improvement the quality of human resources including selection and recruitment process, better qualification through sustainable education as well as internal and external training. The Stella Maris Hospital should also periodically maintain the medical and non medical equipment and facilities as well as establish a electromedical team to supervise the medical and non medical equipment and facilities. In addition, the Stella Maris Hospital also need to improve and control the quality continuously. Such efforts are covered in the perspective learning and growth from Balanced Scorecard concept (Kaplan and Norton, 2008).

3.3. Appraisal Cost

Appraisal costs are costs occurred as a result of the evaluation or audit on an ongoing basis to the standard of services to meet the expectations of consumers (Foord K., 2004). It is intended to evaluate the quality of service to customers. In this study, appraisal fee covered the following costs as follows; the cost of internal surveys, nursing care evaluation cost, and calibration cost of medical facilities of the VIP nursing care unit in Stella Maris Hospital.

Based on figure 3, the appraisal cost in the years of 2008-2009 increased by 0.15%, from 92.8 million IDR to 93 million IDR. Similarly, in the year 2009-2010, the cost valuation increased by 36.54% from 92 million to 127 million IDR. This indicates that an increase in the cost of the VIP care unit has applied a particular system related to the services provided. In addition, the allocation of appraisal costs in the VIP nursing care unit has not been maximized, especially in the years 2009-2010, where the cost of failure has increased by 34.79% (internal and external) even though after the year 2008-2009 it had ever decreased by 0.27%.

The analysis result as shown in table 2 indicates that appraisal cost have a significant relationship to profitability at level of 0.000. In addition, partial correlation coefficients of the appraisal with a value of 0.716 have a positive direction. This value means that the rising cost of appraisal will be followed by the improvement of profitability significantly. Therefore, the Stella Maris Hospital needs to further enhance the allocation of appraisal cost to maximize the profitability of the VIP nursing care unit as also shown in the regression correlation.

Based on the findings, the Stella Maris Hospital has to increase the budget allocated for appraisal cost to maximize its profitability. Several efforts could be improved regarding evaluation process as follows: (1) consistently conducting staff performance and productivity evaluation based on key performance indicator that has been decided together, (2) conducting monitoring and evaluation as well as following up the implementation of nursing care standard, and (3) continuously improving the accreditation status in which one of the criteria is related to nursing care management.

3.4. Internal and External Failure Costs

Internal failure costs are costs occurred due to a mismatch of internal processes to produce the services in accordance with established standards and consumers requirements (Foord K., 2004). In this study, the costs of internal failure include several components i.e., the cost of repairs and costs due to the resignation of HR in the VIP nursing care unit in the Stella Maris Hospital during the periods of 2008-2010.

In addition, based on figure 3, it can be seen that the cost of internal failure in the periods of 2008-2009 decreased by 20.37% i.e., from 33 million IDR to 26 million IDR. Similarly, in the years of 2009-2010, the internal failure costs decreased by 18.13% from 26.4 million IDR to 21.6 million IDR. Such decrease can be caused by the improvement of the quality of internal services in the VIP nursing care unit which then minimizing the cost of internal failure including the cost of repairs and the resignation of HR. Moreover, this decrease can also be caused by the low allocation of funds to fix the internal process improvement in VIP nursing care unit of the Stella Maris Hospital.

Based on the trend in external failure costs during the periods of 2008-2010, which increased by 10.52% in the years of 2008-2009 and then increased again by 35.35% in 2010, therefore the low of external failure costs are caused by the low allocation of funds to fix the improve the internal process of the VIP nursing care unit at the Stella Maris Hospital. Therefore the hospital needs to pay more attention to improve of the internal processes in the VIP nursing care unit to improve the service quality and minimize the external failure costs simultaneously.

Based on the statistical analysis result as illustrated in table 2, the external failure cost has a significant level of 0.715, indicating that there is no significant relationship to the profitability. However, the partial correlation coefficients of the external failure cost is 0.063 implying that the rising costs of internal failure would be followed by an increase in profitability, but not significant. Therefore, the Stella Maris Hospital needs to improve the allocation of costs for the improvement of internal processes to maximize profitability levels as reflected by the regression correlation, but the utilization must be evaluated and controlled continuously.

In relation to the balanced scorecard concept (Kaplan and Norton, 2008), several efforts could be done by the Stella Maris Hospital related to suppress the internal failure cost, among others are: (1) standardizing and implementing the hospital service procedure, (2) implementing patient safety program consistently, and (3) improving remuneration system.

3.5. Profitability

In this study, profitability is obtained through several stages, which are generally divided into 4 stages:

- Calculating the cost of distribution of cost of supporting unit which charged at the hospital for nursing care unit as a center of production costs by using Double-Distribution.
- Counting the cost of the activity in VIP nursing care unit using the Activity Based Costing (ABC).
- Combining the results of the cost of distribution at point (1) the cost of the activity at points (2) to determine the unit cost of VIP care class (Super VIP - VIP C).
- Calculating the difference in profitability with earnings estimates based on hospital rates and earnings estimates based on the calculation of unit cost (Double Distribution and Activity Based Costing).

As can be seen in figure 4, the profitability of VIP nursing care unit withing the year of 2008-2009 decreased by 8.65%, but then increased by 16.32% in the year of 2009-2010. This situation indicates that the service at the VIP nursing care unit at the Stella Maris Hospital is productive and profitable. Among the overall cost of quality, there are several types of costs that can significantly affect the profitability of the VIP nursing care unit including the cost of prevention, appraisal costs, and external failure costs. Prevention and appraisal costs have a positive correlation coefficient to increase profitability, while the external failure costs have a negative correlation coefficient, which can reduce the profitability of VIP nursing care unit significantly. Therefore, it is necessary for the Stella Maris Hospital to minimize the external failure costs through efforts in an integrated quality control and allocation of cost control (cost of prevention and appraisal costs) optimally. Although there is no significant relationship to the profitability, the internal failure cost allocation is still required to be optimized since it still has a positive correlation coefficient that can improve the profitability.

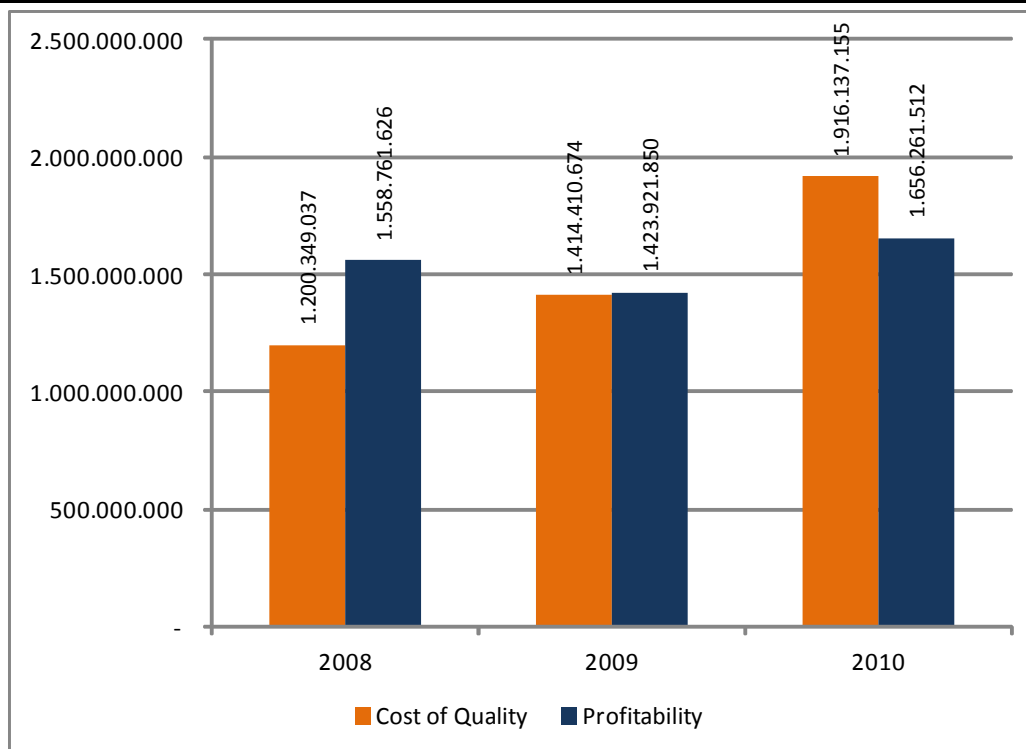


Figure 4. Comparison of Profitability and Cost of Quality within the year of 2008-2010

4. Conclusion

The prevention and appraisal costs have a positive correlation value to the profitability, which means that an increase in prevention and appraisal costs can increase the profitability of VIP nursing care unit at the Stella Maris Hospital. Thus, the hospital needs to improve the allocation of prevention and appraisal costs to support quality improvement of the VIP nursing care unit at the Stella Maris Hospital through well-managed of the budget planning of operational control.

The Stella Maris Hospital needs to suppress the internal and external failure costs by allocating the cost of control (prevention and appraisal costs) which can be used for quality control on an ongoing basis so as to increase the profitability of VIP care unit.

5. Research Limitations and Future Research

This research is limited by data availability related to revenue and financial statement of the VIP nursing care unit at the Stella Maris Hospital. Therefore, the revenue was calculated using an estimation approach. Preferably, subsequent research is required using real data in order to obtain more accurate results.

The calculation of external failure was used bed utilization standards instead of using the standard BOR (Bed Occupancy Rate). According to the Ministry of Health, Indonesia, the ideal number of BOR is supposed to be equal to 80%, but at a certain month the bed utilization is above 80%; consequently it will produce some extreme values in the statistical analysis that could affect the results of analysis of the relationship variables. Therefore, the standard bed utilization using BOR is the maximum standard of 100%. In the inpatient services, the standards of this magnitude can have an impact to the poor quality of service provided. Further studies can use the standard BOR by 80% as recommended by the Ministry of Health, Indonesia.

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