

An Experimental Study on Quality Maintenance in Purchasing

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Abstract

Quality in purchasing process is important for sustainability of the producer-consumer relationship. Purchasing department in a company should not only buy materials, but also should consider consistency of quality of the materials purchased and maintain good relationship with the suppliers in relation with production problems. The main task of a purchasing department is to buy materials in the right quantity, quality, time, and price as well as to deal with services provided by the suppliers. Quality of purchased materials can be evaluated based on the materials received from the suppliers. Quality is considerably better if the acceptance rate of the purchased materials is higher. The rate depends on comparison of the total materials sent by the supplier to those that are accepted by the receiving department. This study evaluates work process in the purchasing department of a cigarette company regarding to the quality of materials provided by the suppliers and proposes development actions based on SMART analysis. The resulted development was then implemented in the department for three semesters to know whether the development really bring the benefits in purchasing process in the company. The result indicates that that suggested actions were able to improve the quality performance.

Keywords: *quality maintenance, purchasing department, quality*

INTRODUCTION

Businesses develop more rapidly in the digitalization era since technology advancement enables them to do their activities faster and more efficient. Companies must be able to adapt their internal activities to the changes in the market (Yusuf, 2016) by conducting continuous improvements in every activity line regularly. The improvement must also be able to integrate the routines into a system enabling things can be conducted quicker and materials needed can be available on time to support the production process to be more efficient and effective. Old system implemented by a company may not enable it to keep up with the fast development of technology and thus cannot offer products as needed by customers.

Quality maintenance is considerably important in maintaining quality of materials needed by company since it can support purchasing activities to meet the qualification of production process. This study addresses the important function of quality maintenance on purchasing process since purchasing is not only related to buying materials needed but also maintaining consistency of quality and cooperation with supplier in case problem in production occurs. The main task of a purchasing department is to buy materials in predetermined quantity, quality, time, and price.

Many well-established companies currently put service from the suppliers as another important factor in examining quality in their purchasing. Quality of the materials is now examined according to material acceptance rate determined by comparing total materials sent by supplier with materials acceptable by the receiving department. The higher the acceptance rate, the better the quality of the materials. Acceptance rate can also become the basis for a purchasing department to evaluate supplier performance as the need to maintain quality of supply increases.

This study addresses purchasing system in PT. XXX (the company is unidentified clearly for secrecy reason). It particularly focuses on the Department of Purchasing Wrapping and Flavour in which it purchases the materials needed based on an agreement with the supplier. Since materials purchased must comply with the predetermined quality, quality maintenance becomes one of the sub departments under the department of purchasing.

The quality maintenance is responsible to manage and communicate the quality of materials so the suppliers can provide them accordingly. It targeted 98% acceptance rate. However, it achieved only 97.2%, which means that there are 2.8% materials bought were rejected. In more particularly, there were 433 rejection cases caused by variety problems: 112 cases were due to incompliance colour with the standard, 63 cases due to damages in print, 15

cases were defect materials, and the rest was mixed. It is apparent that incompliance colour is the biggest problem in relation to material rejection (25.86 %). This study aims at evaluating and developing the quality maintenance in the studied company so that the department can achieve the target quality.

LITERATURE REVIEW

Purchasing gives support to supply chain management and quality management. According to (Olvera & Davidson, 2015), supply chain management and quality management provide organization the competitive benefits in terms of higher quality of product and service that in turn reduces costs. In their study, Olvera and Davidson (2015) tested mediating effect of quality management in purchasing. The result shows that quality management directly affects satisfaction of the internal customers and indirectly influences operational performance of the purchasing. Thus, it is important for a company to select its suppliers as they support the company in getting good quality materials satisfying the internal customers such as receiving unit and production department. This is also in accordance to the fact that purchasing is a system which contains procedures created with integrated pattern to do company's main activities (Ramdani, 2019).

Purchasing system refers to procedure used by a company to do procurement of raw materials needed in the company activities. It is a way to know materials need to buy from suppliers (Hapsari, 2015). Some functions emerge in the system: warehousing, purchasing, receiving, and accounting. Warehousing is responsible for managing the inventory that is used to propose purchasing and to store the materials received. Purchasing is responsible for gaining information on price, selecting suppliers, and releasing purchase order. Receiving has to examine types, quality, and quantity of materials received from supplier for determining

acceptance of the materials. Accounting records transactions in purchasing and is responsible for determining basic price of the materials.

Company can monitor and evaluate the performance of suppliers by determining specific requirements stated in the purchasing documents. Company as the buyer should verify corrective actions of the supplier and give confirmation that problematic conditions such as lack of order, non-conformity order, damage goods, and other noncompliance must have been solved by the supplier. Such evaluation also benefits for monitoring suppliers' performance.

Referring to Silaban, Azizah and Akbar (2021), evaluation is a process to collect descriptive, informative, and predictive data in a systematic way directed to make decision. In other words, evaluation is an identification process to gauge whether an activity or program has been conducted as planned and the goals have been achieved. More particularly, an evaluation carries some functions covering success measurement function, selection function, diagnosis function, and placement function.

To ensure that evaluation runs well, some steps must be followed. First, the topic of evaluation must be determined. Then, activities for conducting evaluation must be set. After data collection, processing and analysing data must then be conducted. Finally, the results of the evaluation must be reported.

METHOD

This is an experimental study covering three steps. The first step is to evaluate the existing condition of the purchasing department in relation to the sub department of quality maintenance. The second step is to create suggestive actions needed for maintaining quality of materials purchased. In the final step, the actions are then implemented for predetermined time

in the purchasing department and the impacts are recorded. If the purchasing department can achieve the target, then the actions are considerably successful.

The study followed some steps. In the first step, evaluation was conducted to the quality maintenance using the framework of evaluation process covering determining evaluation topic, setting evaluation activities, gathering data, and reporting the evaluation results. The topics of evaluation were position and responsibility of the quality maintenance in the department of purchasing, target of the quality maintenance and its realization. There were two evaluation activities that are planned: activity to understand position and responsibility of the quality maintenance in the department of purchasing and activity to know the targets predetermined by the purchasing manager and to compare them to their realization. These two planned activities were the basis for developing suggestive actions for the quality maintenance.

Accordingly, data gathered include organizational structure and responsibility of the quality maintenance; the targets of the quality maintenance; and achievements of the quality maintenance. Evaluation of the existing condition covered the historical data of the company in the form of 12 month purchasing activities (receiving materials in particular) prior to the commencement of the study.

The second step was directed to develop quality maintenance in the department of purchasing. Here, the historical data were analysed for identifying problems. SMART analysis introduced by George T. Doran in 1981 was applied as the tool to determine goals or targets of the department. The analysis was focused on development process planning emphasized on 5 main factors reflected in the name of SMART which stands for specific, measurable, achievable, reliable, and time-bound. The targets were created using SMART analysis as the framework. Parameters for each target were then set according to the aspects of SMART

analysis and adjusted to the encountered problems. Then facts found for each target were evaluated.

The third step is implementation of suggested development. Implementation of the suggestive actions covered 3 semesters since the department conducts reporting every 6 months. Thus progress of the suggested actions can be evaluated at the end of each semester and barriers can be recognized clearly. During the implementation, changes, achievements, and barriers happened or occurred were recorded.

RESULTS

The evaluation covers two main problems in the quality maintenance: authority and responsibility of the quality maintenance and problems encountered by the quality maintenance.

Quality maintenance is the sub department of the department of purchasing wrapping and flavour. The department buy raw materials from suppliers. The materials sent by the suppliers are received by the department of incoming that will evaluate the materials and determine whether they can be accepted or not. The accepted materials will go into the raw material inventory and those are rejected will be forwarded to the quality maintenance that will inform the suppliers about the rejection and propose corrective action required. It is thus apparent that the main tasks of the quality maintenance are to ensure quality of the materials purchased is acceptable and coordinate with the suppliers to take actions to the unacceptable ones. It also manages the colour standard book. The book is the reference for the department of incoming to assure that the materials received in terms of colour comply with the standard.

In terms of authority, the quality maintenance has five authorities. It can invite suppliers to make a deal; can suggest penalties for suppliers that are not follow the procedures or provide

inconsistent quality; can create new method in order to achieve the predetermined target; can suggest auditing to a supplier to ensure consistency of quality supplied; and can suggest new agreement with a supplier that create win-win solution.

There are four main problems occurred in the quality department. First, materials sent by the suppliers do not comply with the determined specification. The second problem relates to the biggest percentage of rejection that caused by non-compliance colour with the standard. Inconsistency in quality provided by the suppliers is the third problem. This relates to the fourth problem that refers to lack of responsibility of the suppliers before sending the materials

Based on the evaluation, parameters were then set in accordance with development of the department. The parameters include target of acceptance rate, existence of reporting system to suppliers, deterrence of supplier in relation to material rejection, and management of colour standard book. Table 1 presents summary of evaluation and suggestion on development of the quality maintenance set using SMART analysis. As illustration, how the specific aspect of SMART used in setting target of acceptance rate. The rate was set specifically by determining the interval between target and realization in the period of 3 semesters. The interval resulted is 0.36% ($= (98.3\% - 97.2\%) / 3$), which then was used to determine the suggested acceptance rate in each semester. Similar way was applied in setting the development of colour standard book which results in the interval of 1.73% ($= (97\% - 91.8\%) / 3$).

Table 1. Evaluation and Suggestion on Development of the Quality Maintenance Based on SMART Analysis

No	Target	Parameter	Existing condition (t)	Suggestion		
				Semester I (t+1)	Semester II (t+1)	Semester III (t+2)
1	Acceptance rate 98.3 %	Acceptance rate	Acceptance rate 97.2 %	97.56%	97.92%	98.30%
2	Increase responsibility of the suppliers toward quality	Reporting system	There is no report to the suppliers	Provide report to the suppliers every 3 months	Provide report to the suppliers every 3 months	Invite main suppliers regularly every 3 months
3	Give deterrent effect to the suppliers	Punishment system	There is punishment system and the suppliers take no problem with the rejection and do no follow-up actions	Create punishment system for the suppliers	Give punishment to a supplier if it experiences 5 times rejection in sequence	Give punishment to a supplier if it experiences 4 times rejection in sequence
4	Renewal colour standard book by 97 %	Colour standard book	Renewal colour standard book by 91.88 %	93.53%	95.26%	97%

Implementation of the suggestions results in the condition summarized in table 2. The acceptance rate meets the target in semester I and III, while that of semester II differs by only 0.02% (97.92% - 97.90%). The barrier encountered in achieving this target relates to accuracy in examining quality of the samples provided by the suppliers. Selecting samples that are representative becomes the challenge for suppliers.

Implementation of reporting system intended to maximize suppliers' performance run as planned even though insignificant problem existed in semester III. Inviting the main suppliers was not easily set due to limitation of time of the suppliers and as result the meeting had to be rescheduled.

Table 2. Evaluation and Suggestion on Development of the Quality Maintenance Based on SMART Analysis

No	Target	Parameter	Existing condition (t)	Result		
				Semester I (t+1)	Semester II (t+1)	Semester III (t+2)
1	Acceptance rate 98.3 %	Acceptance rate	Acceptance rate 97.2 %	98.42%	97.90%	98.43%
2	Increase responsibility of the suppliers toward quality	Reporting system	There is no report to the suppliers	Provided report to the suppliers every 3 months	Provided report to the suppliers every 3 months	Invited main suppliers regularly every 3 months
3	Give deterrent effect to the suppliers	Punishment system	There is punishment system and the suppliers take no problem with the rejection and do no follow-up actions	Created punishment system for the suppliers	One supplier was punished	No supplier was punished
4	Renewal colour standard book by 97 %	Colour standard book	Renewal colour standard book by 91.88 %	95.26%	98%	77.33%

Creating punishment system was scheduled in semester I. A punishment process was suggested to the manager in which punishment is applied to a supplier experiencing 3 sequence rejections. The term of sequence refers to alternatively the same supplier, in the same month, in the same case, or for the same materials. The quality maintenance gives information to the manager about supplier that will be given punishment. However, the decision is on the manager to determine the punishment which includes cancelling the purchase (close PO), reducing the quota order of the material, reducing the quota order of other material supplied by the supplier, and finding back-up supplier by giving some of the quota to other suppliers. In semester II, one supplier experienced 6 rejections in the same month, for the same item, and include the same defect. Since the information on punishment process had been given since it experienced 3 rejections and reduction of quota order was applied, the supplier was then able to increase its quality. In semester III, another supplier experienced 4 sequence rejections. Since

the rejections happened to the same material with different defects, they do not meet the criteria for a punishment. Thus there was no supplier get punished in this semester.

To achieve the target set for colour standard book, dividing the book was proposed and renew all books was required. The suppliers had difficulties in fulfilling this requirement since not all materials are purchased regularly by the company. The renewal was then done to only materials that are purchased regularly. The suppliers are required to have colour standard book for materials they are supplied. The implementation had not been as expected in particularly during semester III. The cause was the difference way in calculating the percentage of renewal. Previously, the percentage was calculated by comparing it to total books, but in semester III it was compared to the number of book available each month. Since this is beyond the authority of the research, there had no suggestive action for this in the implementation.

CONCLUSION

The study resulted in four important parameters in developing the quality maintenance: acceptance rate, reporting system, punishment system, and colour standard book. Suggestion on acceptance rate are 97.56 %, 97.2 %, and 98.3 % respectively for three semesters. In the parameter of system reporting, the suggestive action is to give report to the supplier every 3 months and invite them every 3 months. For the parameter of punishment system, the target was to create the system. Punishment was applied gradually for respectively 5 and 4 sequent rejections in a month in semester II and III. The target for fourth parameter of colour standard book was respectively 93.53 %, 95.26 %, 97%. The implementation had been successfully meet the target and only insignificant problem happened. Review on the barriers occur during the implementation can possibly support continuous improvement. If the implementation continuously applied, the improvement of the quality maintenance will follow. For example, the company may not need to invite good suppliers in relation to implementation of the

reporting system. It can invite other suppliers having less performance. In the future, punishment can be applied for suppliers that do not send materials as expected in particular period.

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