

This research has shown that by continuously measuring most contributing cost items caused by supplier component nonconformance events, the purchasing company would be able to increase the overall quality levels while decreasing the overall costs. It can be done by identifying cost items that typically contribute bulk of the costs in these occasions. Using a model proposed in this research, these cost items can be divided into functional levels and assigned people would be responsible for reporting these costs.

The sum of all the reported expenditures or Total Involved Quality Cost is represented by a matrix. Each matrix is unique for every discovered supplier nonconformance and it shows the most important additional costs that occurred. Outcome of the matrix can be used to calculate Supplier Performance Indicator (SPI), which uses purchase value and Total Involved Quality Cost as an input. By calculating SPI indexes for all suppliers of a same commodity, the manufacturer will have a powerful tool in their hands that will objectively compare suppliers' quality performance. Instead of just comparing purchasing prices, the customer can make its procurement decisions based on the true cost of doing business with each supplier.

The research was done using Ericsson Supply Site Tallinn as an example. A case study method was used to analyze a real situation about supplier quality failure. The communication flow between different departments was mapped and by using visualization software, central people in the process were identified. As a result of the analysis, it was shown that by using central database for supplier quality related data, the general workload for participants in the process would decrease 35%.

Interviews with 12 involved participants were held to find out how the supplier performance is currently assessed and what kind of additional costs occurred during the particular case. After cost analysis, most contributing cost items were considered when creating the model to calculate Total Involved Quality Cost. The proposed framework should be made into customized software that allows data collection, storage and analysis. During the interviews, it was also discovered that general knowledge about supplier quality effects and supplier quality management is low. In order to get the best result from using the framework, internal supplier quality awareness campaigns or trainings are recommended.

It is inherent for new information to emerge when using a case study method and a few other improvement areas were identified during the interviews. Currently one of the most important supplier quality attributes is parts per million or PPM. It was shown that instead of calculating PPM on a monthly basis using monthly data it should be done using three months moving

average data. This way, the PPM result is less subject to the variable amount of monthly consumption and rejected pieces. It was also discovered that some months before the defective parts in Ericsson Supply Site Tallinn were found, the same component defect was discovered in another factory. If the global quality organization would have used the information on time, the following quality incident and the costs in Ericsson Supply Site Tallinn might not have occurred at all. A more agile response to these occurrences in the future would help to decrease the number of similar quality failures in multiple factories.

The developed framework and other proposals can be seen as separate actions but for overall quality improvements in a manufacturing company, they should be considered as a whole. The more a company knows about possible supplier quality failures, the less it would need to use tools to assess the effects of them. If however they do occur, the proposed model and updated PPM calculations method would give the manufacturer the best possible overview about its' supplier quality performance. As up to half of quality issues are caused by suppliers, enhanced evaluation and selection will lead the manufacturer to better quality and decreased costs. Although the framework was developed using an example factory, it does not limit the applicability of it in another companies.