Returns on Quality – RoQ Model

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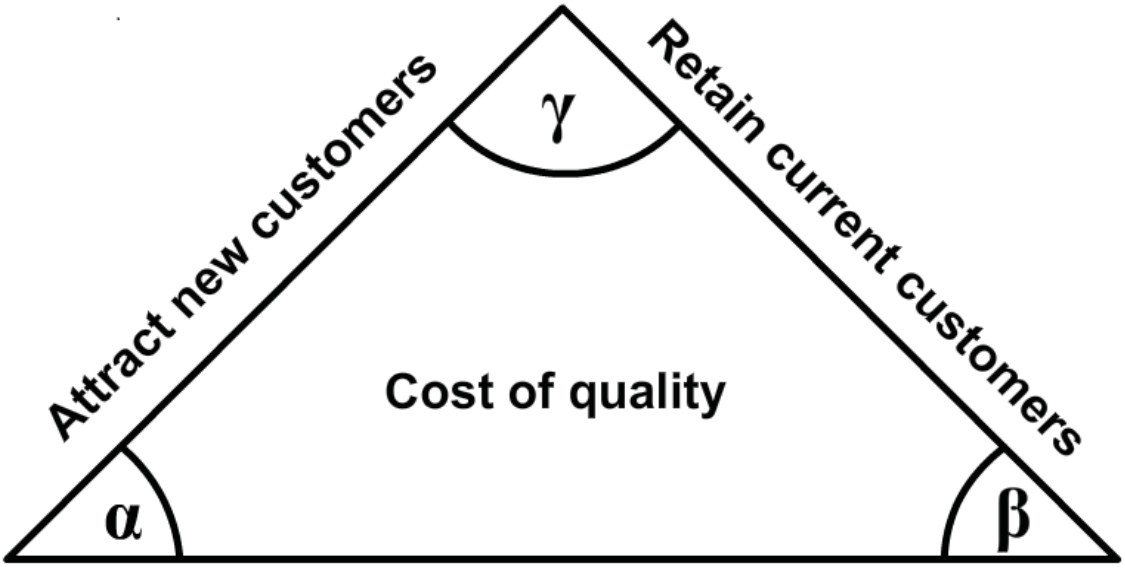
Actually sequence of steps

- Preparation for certification of quality management system,
- Building the system,
- Certification of system,
- Application of quality programmes (TQM, Six sigma),
- Effort to acquire one of the national awards either for quality management system or product properties.

Major aspects of quality

- technical aspect; a product must be designed and manufactured with the properties assuring that the customer satisfaction will be met,
- communication aspect; customers must be convinced about the advantage of an offered product's purchase; thus the acquisition of new customers and retention of current ones are the matter of communication aspect, yet it is the communication aspect which is not sufficiently regarded in quality programmes,
- economic aspect; the aim of the quality programmes should be neither increasing the technical level of individual properties of the manufactured products, nor increasing the level of satisfying the customer needs, but achieving the advanced technical level of the manufactured products and satisfying the customer needs, i.e. achieving better economic results and profitability of the enterprise.

QUALITY TRIAD



Research, development, preproduction

α - product attributes

β - market share

γ - return on quality

Basic steps of quality increas

- **Step 1:** carrying out the research targeted to determining the customer requirements and assessing the organisation's ability to meet those requirements; elaborating the list of requirements and harmonising the customer requirements with the organisation processes.
- **Step 2**: carrying out the communication with customers in order to convince them about the organisation's ability to meet customer expectations,
- **Step 3**: assuring the impact of the manufactured products'quality on customer satisfaction,
- **Step 4:** measuring the market share and the impact of quality on the achieved profit. Within this step, it is necessary to determine the quality programme related costs, net present value (NPV) due to the increased market share and to compare the profit improvement with the costs associated with the implementation of quality programmes.

Structure of quality costs

- costs for research, development and preparation of production,
- costs for retaining current customers,
- costs for acquiring new customers.

Steps of monitoring and assesing the quality costs

- defining the cost issues that will be included into particular groups of quality costs,
- determining responsibility for issuing the initial documents for individual cost issues,
- establishing a system for collection and summarisation of quality costs,
- assessing the impact of quality costs on the company profit.

$$ROQ = \frac{P}{CRD + CD + CO}$$

where
P is profit from the production of particular product,
costs for research and development (CRD),
costs for defensive strategy (CD) and
costs for offensive strategy (CO)

$$NPV = \sum_{i=1}^{n} \frac{CF_t}{(1+k)^t} - (C_{rd} + C_i)$$

- where :
- NPV is present net production,
- CF is cumulated value of cash flow,
- Ci are investment costs for particular product,
- CQ are quality costs for particular product,
- k is corporate discount rate
- t are costs for the years 1 to n
- n is manufacturing period of a product in years.

- In the companies which produce more products an indicator could be used expressing the ratio of reached profit for the whole production programme to the total of costs on research and development of produced products. The indicator of quality returns has the following form:

$$ROQ = \frac{\sum P_i}{\sum CQ_i}$$

- Mentioned indicators may also be used to monitor the development in the time sequence using the indicator expressing the ratio of reached profit in „j“ period to the total of costs on research and development in a certain period to the same indicator in „i“ period. This indicator has then the following form:

$$ROQ_{ij} = \frac{\frac{\sum P_j}{\sum CQ_j}}{\frac{\sum P_i}{\sum CQ_i}}$$

- where the meaning of symbols is know from the previous interpretation. For this case, mainly if the company monitors the costs on quality according to the PAF model, it is possible to express the indicator of quality returns in the following way:

$$ROQ = \frac{\sum P_i}{\sum CQ_i}$$

- where P_i is the total of profits and
- CQ_i are the costs on quality according to the PAF model.

- Such extension may lead to the expression of a „completion ROQ indicator“, which would represent the sequence of the following items:
  - costs on research and development,
  - losses from the non-qualitative production,
  - costs on defensive market strategy,
  - costs on offensive market strategy.
- Completion quality returns would be then equal to the ratio of profit (or present net value or economic value added)

$$KROQ = \frac{P}{CRD + LQ + CD + CO}$$

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- KROQ is a completion quality return
- CRD are costs on research and development
- LQ are losses from the non-qualitative production
- CD are costs on defensive strategy
- CO are costs on affensive strategy
- P is a reached profit for a certain period.

Thanks for your attention