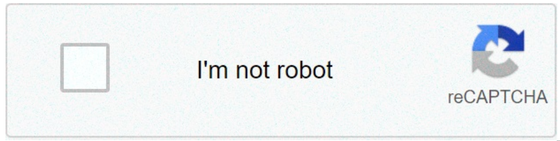

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Taguchi quality loss function example

The quality loss function is a method for measuring losses that are incurred due to non-perfect production, however compliant. Most of the global quality of global quality losses is occurring in the long term, relating to consumer dissatisfaction, market loss, inventory increases, performance fall, etc. To estimate them the quality loss function is used. The way the loss function is defined depends on the type of quality characteristics. The idea created by Genichi Taguchi revolutionized approach to the product quality guarantee. Two types of factors interact with the functional characteristics of the product: controllable, which can be easily inspected and maintained, interfere, what control is difficult and often impossible. These actions in any case are very expensive. Interfering factors It is possible to extract the three types of interference base: external noise, for example: deriving from the impact of weather and environmental conditions, of the internal noise, such as: aging equipment, tolerances that cause The deterioration, between the noise of the products caused by imperfections in process production and cause deviations between the individual copies of the product. The interfering factors are responsible for the deviation of the functional characteristics of the desired value. Because the measurement of these factors is expensive and often impossible, in the Taguchi method, we do not try to identify them, then check, but rather select these values of controlleable factors that minimize the sensitivity of the product and the process to the variations of the interfering factors . Instead of seeking and eliminating the causes, we try to reduce the impact of these causes. This type of procedure allows you to create a product resistant to interference. Example of quality loss function of the design method. The blue line shows the loss loss difference between traditional parameters and taguchi approach parameters is a key step in the Taguchi method, which can better meet the condition of improving quality without a relative increase in costs. This step is part of the design process in quality off-line control. System design activities include: selection of materials and components, selection of product test parameters, choice of production equipment, chosen process sample values. The design parameters include preliminary tests of the fixed nominal values and based on the tests that determine the best combination of product performance levels and operating levels of process indicators, so that they are more resistant to changes in the external environment and others Confondive factors. The tolerance design is used in cases where the elimination of the deviations reached during the design parameters is unsatisfactory. The design determines the exact tolerances for these parameters or indicators of a product or process whose deviation from the desired (nominal) exercises a strong influence on the final deviation. These activities imply funds for the purchase of materials, components or devices of best quality. The parameter design objective is to seek these nominal values for the controllable factors that meet the conditions for maximum product compatibility at lowest cost and maximum susceptibility to interference. It is assumed to proceed as follows: Identify the controllable factors and interfere and consider them separately, conduct the analysis of the data using the signal (controllable factor) to the noise ratio as a performance measure (conformity) the S / N signal is inversely proportional to the loss function, therefore the maximization of Report means minimizing losses in improving quality. Although the Taguchi method thanks to its many advantages both propagated all over the world, in practice only 1% of the engineers trained in its application usually uses it. The vast majority of European and Western European producers in the design of productive products and processes use only selected items, usually quantitative quantities the method. Taguchi formula The loss generated by a UNIC is calculated using the formula (y) = k (yt) ^ 2) (k = c / d ^ 2) where: l (y) - the loss of Currency K - A constant of proportionality depends on the OrganizationÃ ¢ s Structure of bankruptcy costs, Y - actual value of the quality feature, T - Objective value of quality characteristic, C - Loss associated with the specific limit, D - Deviation of the specification from the value target. Asymmetrical Quality Function Loss The Asymmetrical Quality Loss function implies that variations can have a different impact on the level of loss. If it happens, one side of the function will be different from another side (asymmetry). To establish asymmetric function loss, you need to calculate the loss of each side and then add them to get the result. Examples of asymmetric qlf soft drink - symmetrical, as far as little detour will remain unnoticed, delivery times - asymmetrical, early delivery usually has no effect, air pressure in tires - asymmetrical, too little pressure can destroy the rubber slowly , but too high will destroy references suddenly quality loss function described in more mathematical way Ames, AE Mattucci, No. Macdonald, S. Szonyi, G. Hawkins, DM (1997) Quality loss functions for more optimization Response surfaces, official Quality Technology 29.3: 339-346. Om Prakash Y., Sunil SB, Ajay R. (2010) Rusticity based on robust design optimization: a multi-target picture using the hybrid quality loss function, quality and reliability Engineering International, Volume 26, Issue 1 Author: EDYTA GWÃƒÂ³ã ... âºdÃ ... âº, SA Loss function awomir wawak Taps is graphic representation of the loss developed by the statistical Japanese business Genichi Taguchi to describe a phenomenon that concerns the value of the products manufactured by a company. Praised by Dr. W. Edwards Deming (The Guru of the Movement of the Movement Quality 1980 american), [1] which has clarified the concept that the quality is not suddenly precipitate when, for example, a drift exceeds a rigid project tolerance. Instead 'value loss increases progressively with variation increases from the expected condition. This was considered an important step forward in describing quality, and helped to feed the continuous improvement movement. Tummy quality loss function concept was in contrast with the American quality concept, popularly known as the pole philosophy of the door, the concept given by the American quality Guru Phil Crosby. Goal Post philosophy stresses that if a product function does not meet the designed specifications it is defined as a poor quality product (rejected), regardless of the amount of deviation from the nominal value (average value of the tolerance area). This concept has a similarity with the concept of scoring a 'goal' in the game of football or hockey, because a goal is counted 'one' regardless of the place of the ball strike in the pole of the door ', whether it is to hit Or to the corner. This means that if the product size comes out of the tolerance limit the quality of the product suddenly drops. Through its concept of quality loss function, taguchi explained that from the customer's point of view this drop of quality is not sudden. The customer experiences a loss of quality this time of product specification deviates from the 'objective value'. This 'loss' is represented by a quality loss function and follows a parabolic curve mathematically in l = k (yÃ ¢ m) 2, where m is the theoretical 'target value' or 'average value' eye is the Current size of the product, K is a constant and loss. This means that if the difference between 'real size' is the objective value ' (yÃ ¢ m) is great, the loss would be more, independently specifications of tolerance. The specifications of tolerance view of in tags are given by engineers and not by customers; What are the customer's experiences is 'loss'. This equation is true for a single product; if 'loss' must be calculated for more products the loss function is given by l = k [s2 + (to y y {bar {y}}} Ã ¢ â,¬ "m) 2], where s2 is the" variation of the product size "eye Ã ¢ â¯ {displaystyle {bar {y}}} is the Medium size of the product. Overview The taguachi loss function is important for a number of reasons - mainly, to help engineers better understand the importance of design for variation. See also Tauto Tapski methods also focus on the robust design of the Model. Reference ^ Deming, W. Edwards (1993). The new economy: for industry, government, education. MIT Press. IsbnÃ ¢ 0-911379-05-3. Recovered by "https: // en .wikipedia.org. Title = taguchi_loss_function & oldid = 982031209 "summary of cathy riemer master of accountancy program university of south florida, summer 2002 the goalpost (traditional) traditionally quality view, companies measure the quality of the number of Defects or default rate. In this system, defects are identified through inspections of the Materials and products. The higher and lower quality limits are established. Everything that is not within the limits is considered a defect. This view also refers as a view of goalpost because it can be conformed to the use of goalkeepers in football. If the additional point goes between the goals posts it is considered a success. It doesn't matter if it were or not to the center or near the sides. However, if the ball goes wide, to the left or right, he didn't succeed. Show 1 Show this view. Quality loss function (QLF) The quality loss function is based on electrical engineer work, gear tapsuchi. This view does not agree with the traditional view (goalpost). The quality loss function recognizes that the products that fall between specific limits are not all the same. The four following statements summarize the philosophy of Taguchi. 1. We cannot reduce costs without affecting quality. 2. We can improve quality without a growing cost. 3. We can reduce costs by improving quality. 4. We can reduce costs by reducing variation. When we do it, performance and quality will improve automatically. In the taguchi view, the quality is not defined by specific limits, but rather on whether or not it creates a financial loss to society. An indicated example is a defective automotive exhaust system that creates atmospheric pollution. There are many types of quality loss functions. However, in all types, the loss is determined by evaluating the variation from a specific objective. Taguchi's philosophy includes three general ways to evaluate the relationship between quality and variability. The nominal is a better approach in this approach, closer to the target value, the better. It doesn't matter if the deviation is above or below the target value. Under this approach the deviation is quadratic. The following exhibition portrays the nominal is a better approach. Smaller is a better approach, the smallest is a better approach is when a company wants the smallest values. Because the value becomes larger, the sustained loss grows. The following show portrays the smallest is a better approach. Bigger is a better bigger approach is better than occurs when a company wants higher values than a feature. Two examples provided are employee participation and customer acceptance rate. Under this approach, the larger is the characteristic, smaller is the function of quality loss. The following exhibition portrays the biggest is a better approach. Uses of quality loss data (QLF) Data 1. Reduces costs There are three ways in which managers can use QLF to reduce costs. 1. Move the average of the actual distribution closest to the target value. 2. Reduce variability. 3. Make a combination of both. 2. Setting the specific limits the data of the function quality can be used to determine where the limits to help minimize the losses must be set . Example Sony Corporation Sony uses the Taguchi model in the management of the TVs that it produces. The quality characteristic is the density of color televisions . Sony's engineers set specific limits for color density to a more or less tolerance level . One of Sony's plants are distributed evenly television television It fell between the limits of the specifications. The other plant followed a normal distribution with an average near the target set. A comparison of customer responses shows that a higher level of satisfaction on televisions has been reported from the second plant. Furthermore, the guarantee costs of the second plant were lower. This case shows the problem with focusing on a defect rate rather than a variation from the target. The first plant sent to a zero defect rate, however, the limits of the allowed specifications for too much variation. In the second plant, the limits were smaller and the quality was more consistent. The Taguchi model offers a good way to analyze the costs associated with variability, even within the limits. In conclusion, if companies want to remain competitive, they must provide quality products. To achieve this, a company must focus on reducing the variability of a product characteristics around a specific objective value. The traditional approach is not enough. To remain a competitor in the world, a company must consider the QLF taguchi approach. _____ Related summaries: Albright, T. L. and H. Roth. 1992. The measurement of quality costs: an alternative paradigm. Accounting Horizons (June): 15-27. (Summary). Anderson, S. W. and K. Sedolo. 1998. Quality design in products: the use of accounting data in the new product development. Accounting horizons (September): 213-233. (Summary). Deming, W. E. 1993. The new economy for industry for industry, government and education. Cambridge: Massachusetts Institute of Technology Center for advanced engineering studio. Chapter 10. (summary). Kim, M. W. and W. M. Liao. 1994. Estimate of the quality costs hidden with the functions of quality loss. Accounting horizons (March): 8-18. (Summary). Martin, J. R. not dated. 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