

ASIGURAREA CALITĂȚII – QUALITY ASSURANCE

CUPRINS – CONTENTS

- ❑ **The Dissemination of Six Sigma** 2
Ton van der Wiele, Jos van Iwaarden, David Power
- ❑ **Application of Six Sigma and Promethee Multicriteria Method to Select the Product System** 11
Lotfi Azzabi, Dorra Ayadi, Abdessamad Kobi, Christian Robledo, Younes Boujelbene
- ❑ **Single Sampling Plans for Reliability Inspection when Time-to-Failure is Rayleigh Distributed** 18
Emil Petrescu, Viorel Gh. Vodă
- ❑ **Optimization of a Step-stress Accelerated Life Test Plan by Genetic Algorithm** 24
Pascal Lantieri, Fabrice Guerin
- ❑ **Designing the Reliability of Electronic Components** 30
Marius Bazu, Titu Bajenescu

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The Dissemination of Six Sigma

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Abstract

The purpose of this study is to examine the intra-organisational diffusion of management innovations, taking Six Sigma as a recent management innovation. The study will focus on Six Sigma implementation among companies operating in Ireland. This paper will add knowledge to the diffusion of management practices (Six Sigma implementation). This has been achieved through a theoretical framework which posited that multinational firms act as a diffusion mechanism for Six Sigma. Intra-organisational diffusion does exist. Taking the example of Dell Computers, it was shown that multinationals do act as a diffusion mechanism – Dell first adopted Six Sigma at US headquarters level and then the practice diffused internally to its Irish subsidiary and subsequently to its suppliers and finally other local firms. However the role of traditional diffusion mechanisms was also highlighted. The analysis of Six Sigma implementation consisted of an online survey of 125 firms. Subsequently a qualitative analysis of Six Sigma implementation was conducted through semi-structured interviews with 13 respondents. The results show that roughly half of respondent firms use Six Sigma. These firms are typically large US multinationals and have been using Six Sigma for 3 years. Firms adopt Six Sigma in response to competitive pressure and for cost/efficiency reasons.

Keywords: Six Sigma, Management, Diffusion, Ireland.

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Application of Six Sigma and Promethee Multicriteria Method to Select the Product System

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Abstract

The present competitive market is focusing industrial efforts on producing high-quality products with the lowest possible cost. Currently and for a long time, quality is the centred of the concerns of the industrial organizations, which provide products intended to satisfy the customer requirements. The total performance of the process and the quality of its production depend on the one hand, of the characteristics of the intermediate products, and on the other hand, of the operation parameters of the manufacturing. To help accomplish this objective, various quality improvement philosophies have been put forward in recent years and of these Six Sigma has emerged as perhaps the most viable and efficient technique for process quality improvement. The objective of this paper is to propose a method that puts in obviousness the enforcement performances improvement Six Sigma to assure high level quality products and to make firm a level of improvement of the long-term performance. The application of the Six Sigma methods enforced with multicriteria approach especially the Promethee methods to permit classification the better's choices of a Tunisian industry in order to visualize his importance level.

Keywords: Quality, Six Sigma, Performance, Multicriteria approach, Product system.

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Single Sampling Plans for Reliability Inspection when Time-to-Failure is Rayleigh Distributed

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Abstract

In this paper we construct single sampling plans for reliability inspection using a combination between the attributive method already standardized (see Kirkpatrick, 1970 [11], pp. 354 – 415) and a specific failure behaviour of underlying units submitted for testing. This method establishes a link between the fraction defective (p) of the batch and the hazard rate function assumed to be a Rayleigh one – that is a linearly increasing form. Some examples and all tables needed for operational purposes are given.

Keywords: hazard rate, AQL (Acceptable Quality Level), Rayleigh distribution, sampling scheme.

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Optimization of a Step-stress Accelerated Life Test Plan by Genetic Algorithm

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Abstract

The accuracy of estimates obtained from a step-stress accelerated test (SSALT) depends on the distribution of failures among the different stress levels. When prior estimates are available for the lifetime parameters, random generation of times-to-failure can be used to simulate different SSALT defined with given profiles. Then, the simulation results can be processed to obtain posterior estimates and thus errors with prior estimates. The best SSALT could be found by minimizing this error but evaluating a wide enough range of plans takes a too long calculation time. On the other hand, limiting the possible plans may eliminate the best one. To shorten the minimization process without a priori limitation in the ranges of tested plans, this paper suggests using a genetic algorithm.

Keywords: SSALT, reliability, estimation accuracy, optimization, genetic algorithm.

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Designing the Reliability of Electronic Components

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Abstract

A new method of designing electronic components by taking into account the reliability of the future product is introduced. The concept is named Design for Reliability (DfR) and it is linked to the robust design. The proceeding for performing DfR is briefly described, with examples showing the main advantages of the method.

Keywords: Reliability, Design for Reliability, Robust design, Concurrent engineering.

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