

Phatthanawilai Inmai 2009: A Comparison on Efficiency of Control Chart for Number of Non-conforming. Master of Science (Statistics), Major Field: Statistics, Department of Statistics. Thesis Advisor: Associate Professor Somboon Sukpong, M.S. 94 pages.

The objective of this research was to compare the efficiency of np control chart, CRL control chart, SCRL control chart and synthetic control chart when the probability distribution of the data was binomial distribution. The factors concerned were fraction non-conforming (p_0) at 0.01, 0.03, 0.05, 0.07, and 0.1. Sample size (n) at 5, 10, 20, 30, 50, 100, and 150, and shift of fraction non-conforming (δ) at 1.1, 1.3, 1.5, 1.7, 2.0, 3.0, and 4.0. Total cases were 245 cases. The criteria used to meet this objective were the Probability of Type I Error ($\hat{\alpha}$) while the process was in control, and Average Run Length while the process was out of control. The data were generated with 10,000 times.

The results were as follows; for the situation that process was in control, with the fraction non-conforming of 0.07 and 0.1, np control chart and synthetic control chart were able to control the probability of type I error in every sample size. However, synthetic control chart performed better. CRL control chart could also control the probability of type I error in every sample size, except 100 and 150. For the situation that process was out of control, CRL control chart was the most efficient control chart at each sample size. When fraction non-conforming were 0.05, 0.07, 0.1 and shift of fraction non-conforming were 3.0 and 4.0, synthetic control chart was the most efficient control chart. Moreover, with sample size larger than 20, synthetic control chart was the most efficient control chart, when fraction non-conforming was less than 0.05 and shift of fraction non-conforming were below 3.0.

Student's signature

Thesis Advisor's signature
