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On Control Charts For some Probability Distributions with Application

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Abstract

Statistical Process Control (SPC) is a collection of statistical and analytical tools that may be used to attain process stability and variability reduction about the process target value. The most important tool in SPC is the control charts, which was introduced by Shewhart in the 1920'. A control chart monitors a production process based on information observed from individual items or subgroups of items from the process. The statistic is then plotted against the control chart's control limits. If the control chart statistic exceeds the control limits, the control chart will issue a sign shows that the process has changed.
The thesis is concerned with two basic aspects: -

(1) The thesis is concerned with present a new Kumaraswamy Control Charts for Monitoring variable of Fraction Data (p chart). Kumaraswamy control chart assumes that the fraction data can be approximated with a Kumaraswamy distribution and proposes new control limits based on Kumaraswamy distribution.

Application used three examples of fractions data sets to compare the control limits proposed by Shewhart, Ryan (1989), Chenn (1998), Beta (2012) and Kumaraswamy charts.

(2) an attribute (np) control chart is developed for the new weibull pareto distribution under a time truncated life test. The performance evaluation of the proposed control chart is studied using the average run length (ARL). The tables are presented for various values of shape and scale parameter, sample size, specified ARL and shift constants. Numerical study is given to demonstrate the performance of the proposed control chart for monitoring of non-conforming items in the industries.