

COMPUTER PROGRAM FOR THE HOTELLING T^2 CONTROL CHARTS

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The paper presents a computer program for the Hotelling T^2 Control Chart. The program was developed in MS Excel 2007. Two quality characteristics are simultaneously controlled. The number of samples, m is equal to 25 and the size of the samples, n is equal to 3.

The values of the statistic T_k^2 are calculated by means of the formula (1).

$$T_k^2 = n \cdot \begin{pmatrix} \bar{X}_{1k} - \bar{\bar{X}}_1 \\ \bar{X}_{2k} - \bar{\bar{X}}_2 \end{pmatrix}' \cdot \begin{pmatrix} \bar{S}_1^2 & \bar{S}_{12} \\ \bar{S}_{21} & \bar{S}_2^2 \end{pmatrix} \cdot \begin{pmatrix} \bar{X}_{1k} - \bar{\bar{X}}_1 \\ \bar{X}_{2k} - \bar{\bar{X}}_2 \end{pmatrix} \quad (1)$$

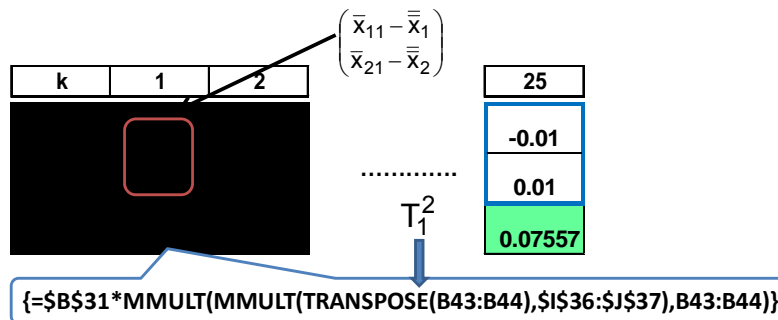


Figure 1. The calculation of the statistic T squared for each sample

Using values of the statistic T_k^2 and the control limits, the program plots the Hotelling chart (Figure 2).

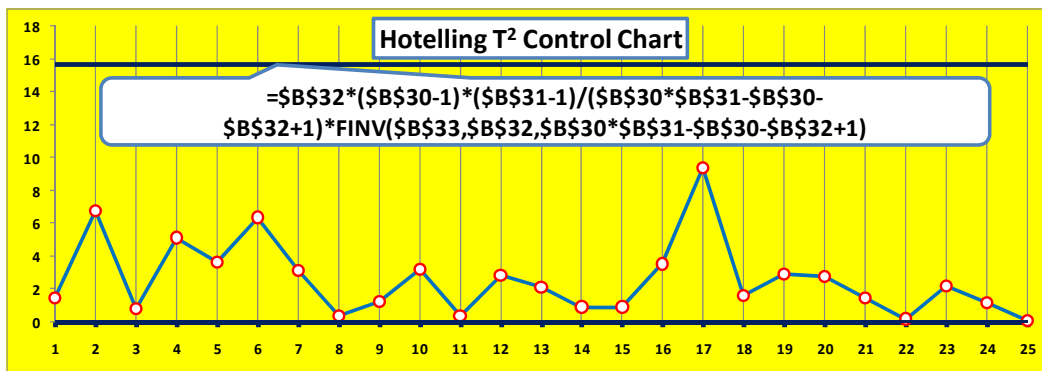


Figure 2. The Hotelling Control Chart

REFERENCES

1. Montgomery, D.C. Introduction to Statistical Quality Control, Fifth Edition. John Wiley & Sons, Inc., New York, 2005, pp. 491-500, ISBN: 0-471-65631-3.
2. *** Microsoft Excel 2007 Help