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# Understanding Statistical Process Control

Third Edition

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## Preface to the Third Edition

In teaching out of the Second Edition, I became aware of certain sections that could be improved upon and other sections that were no longer of much use due to the increasing automation of the job of analyzing our data. The purpose of this edition is to amend these shortcomings. First of all, throughout the book I have updated the terminology. Rather than the emotionally charged terms “out-of-control” and “in-control” you will now find the more appropriate and descriptive terminology of “unpredictable” and “predictable.” Rather than the obscure “controlled variation” you will find the more descriptive “routine variation,” while in place of “uncontrolled variation” you will find “exceptional variation.” As you will find on page 6 these changes respect the idea behind Shewhart’s work without getting lost in his early Twentieth Century semantics.

In Chapter Five I have revised the explanation and illustrations of the Western Electric Zone Tests. Hopefully this treatment will be clearer and more informative than before.

Chapter Six has been completely rewritten. When the Second Edition was prepared the topic of process capability was surrounded by confusion due to a multiplicity of formulations. Since that time a certain amount of standardization has occurred for the formulas, although there still appears to be plenty of confusion regarding the interpretations of those formulas. Here I have tried to clarify both the interpretations and the relationships between the various Capability and Performance Indexes. Finally I have outlined and illustrated how these Capability and Performance Indexes can be converted directly into Effective Costs of Production and Use.

In Chapter Nine the sections on Moving Average Charts and Median Charts were dropped since virtually no one uses these techniques today. In their place I included a new section which examines the nature of data for clues to the roles played by Control Factors, Assignable Causes, and Common Causes.

Chapter Ten was slightly streamlined, with greater emphasis on the role of the  $XmR$  Chart with count data. One example in Chapter Eleven was expanded. And the section on the Transformation of Data in Chapter Thirteen was completely rewritten with a specific example and new graphs to illustrate the pointlessness of this common exercise.

Finally, along with a revised Bibliography, the tables were expanded to provide more explanatory material. In addition, test data sets are included, along with answers, for use in verification of the computations in software packages.

Hopefully these changes will be useful to all who seek to understand SPC.

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