

Statistical Process Control

For Susan, Jane and Robert

Statistical Process Control

Fifth Edition

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Preface

Stop Producing Chaos – a cry from the heart! When the great guru of quality management and process improvement W. Edwards Deming died at the age of 93 at the end of 1993, the last words on his lips must have been ‘Management *still* doesn’t understand process variation’.

Despite all his efforts and those of his followers, including me, we still find managers in manufacturing, sales, marketing, finance, service and public sector organizations all over the world reacting (badly) to information and data. They often do not understand the processes they are managing, have no knowledge about the extent of their process variation or what causes it, and yet they try to ‘control’ processes by taking frequent action. This book is written for them and comes with some advice: ‘Don’t just do something, sit there (and think)!’

The business, commercial and public sector world has changed a lot since I wrote the first edition of *Statistical Process Control – a practical guide* in the mid-eighties. Then people were rediscovering statistical methods of ‘quality control’ and the book responded to an often desperate need to find out about the techniques and use them on data. Pressure over time from organizations supplying directly to the consumer, typically in the automotive and high technology sectors, forced those in charge of the supplying production and service operations to think more about preventing problems than how to find and fix them. The second edition of *Statistical Process Control* (1990) retained the ‘took kit’ approach of the first but included some of the ‘philosophy’ behind the techniques and their use.

In writing the third and fourth editions I found it necessary to completely restructure the book to address the issues found to be most important in those organizations in which my colleagues and I work as researchers, teachers and consultants. These increasingly include service and public sector organizations. The theme which runs throughout the book is still PROCESS. Everything we do in any type of organization is a process, which requires:

- UNDERSTANDING,
- has VARIATION,
- must be properly CONTROLLED,
- has a CAPABILITY, and
- needs IMPROVEMENT.

Hence the five new sections of this edition.

Of course, it is still the case that to be successful in today's climate, organizations must be dedicated to continuous improvement. But this requires management – it will not just happen. If more efficient ways to produce goods and services that consistently meet the needs of the customer are to be found, use must be made of appropriate methods to gather information and analyse it, *before* making decisions on any action to be taken.

Part 1 of this edition sets down some of the basic principles of quality and process management to provide a platform for understanding variation and reducing it, if appropriate. The remaining four sections cover the subject of Statistical Process Control in the basic but comprehensive manner used in the first four editions, with the emphasis on a practical approach throughout. Again a special feature is the use of real-life examples from a number of industries, and these have been extended in several ways in this edition.

I was joined in the second edition by my friend and colleague Roy Followell, who has now retired to France. In this edition I have been helped again by my colleagues in Oakland Consulting plc and its research and education division, the European Centre for Business Excellence, based in Leeds, UK. A major addition in this edition is Chapter 14 on six sigma. Like all 'new management fads' six sigma has been hailed as the saviour to generate real business performance improvement. It adds value to the good basic approaches to quality management by providing focus on business benefits and, as such, now deserves separate and special treatment in this book.

The wisdom gained by my colleagues and me at the Centre and in the consultancy, in helping literally thousands of organizations to implement total quality management, business excellence, good management systems, six sigma and SPC has been incorporated, where possible, into this edition. I hope the book now provides a comprehensive guide on how to use SPC 'in anger'. Numerous facets of the implementation process, gleaned from many man-years' work in a variety of industries, have been threaded through the book, as the individual techniques are covered.

SPC never has been and never will be simply a 'tool kit' and in this edition I hope to provide not only the instructional guide for the tools, but communicate the philosophy of process understanding and improvement, which has become so vital to success in organizations throughout the world.

The book was never written for the professional statistician or mathematician. As before, attempts have been made to eliminate much of the mathematical jargon that often causes distress. Those interested in pursuing the theoretical aspects will now find, at the end of each chapter, references to books and papers for further study, together with discussion questions. Several of the chapters end with worked examples taken from a variety of organizational backgrounds.

The book is written, with learning objectives at the front of each chapter, to meet the requirements of students in universities, polytechnics, and colleges engaged in courses on science, technology, engineering, and management subjects, including quality assurance. It also serves as a textbook for self or group instruction of managers, supervisors, engineers, scientists and technologists. I hope the text offers clear guidance and help to those unfamiliar with either process management or statistical applications.

I would like to acknowledge the contributions of my colleagues in the European Centre for Business Excellence and in Oakland Consulting. Our collaboration, both in a research/consultancy environment and in a vast array of public and private organizations, has resulted in an understanding of the part to be played by the use of SPC techniques and the recommendations of how to implement them.

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