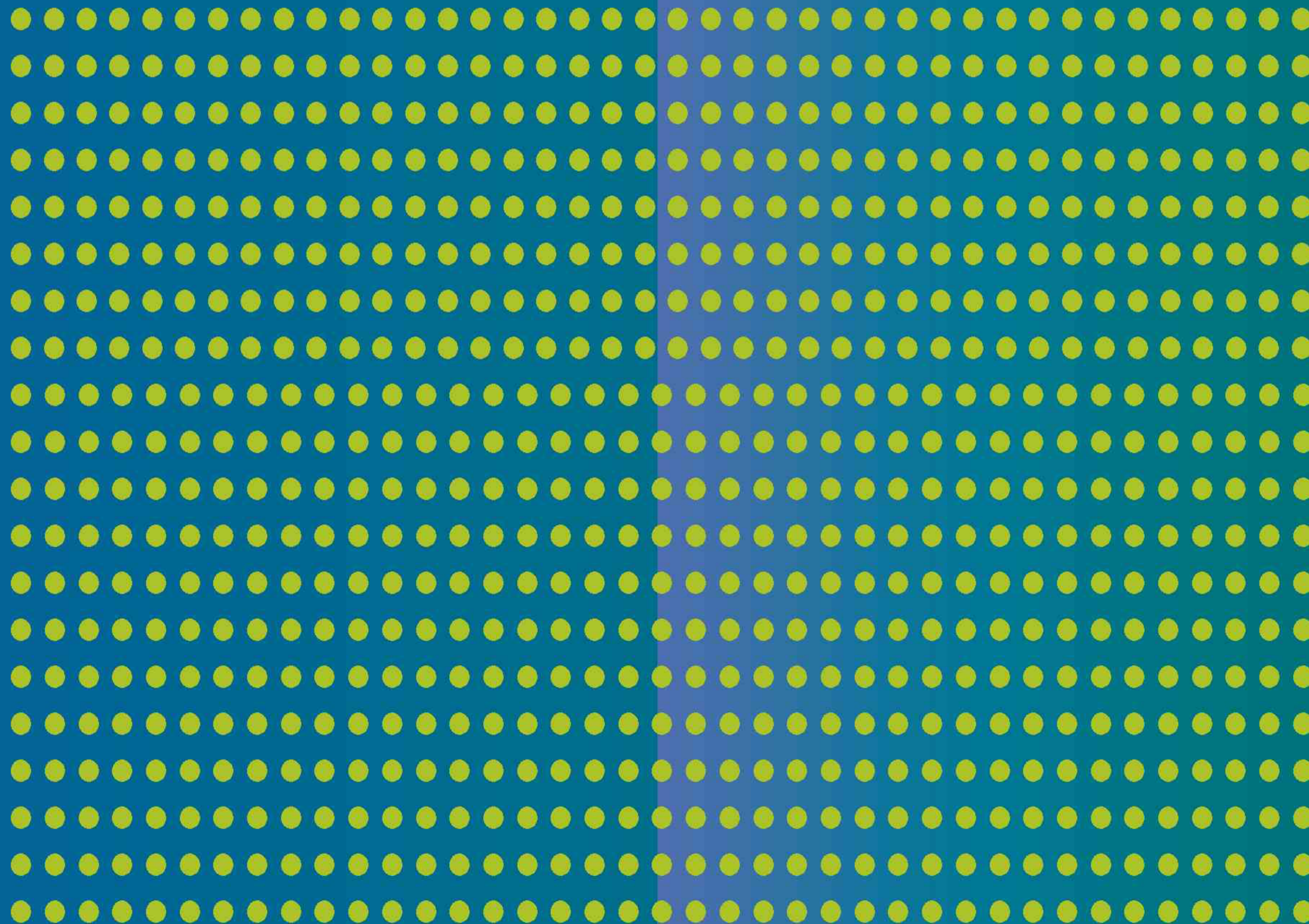


PEARSON NEW INTERNATIONAL EDITION

Quality Improvement

Dale Besterfield
Ninth Edition



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Pearson Education Limited

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Harlow

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England and Associated Companies throughout the world

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INTRODUCTION TO QUALITY IMPROVEMENT

OBJECTIVES

Upon completion of this chapter, the reader is expected to

- be able to define quality, quality control, quality improvement, statistical quality control, quality assurance, and process;
- be able to describe FMEA, QFD, ISO9000, ISO14000, Benchmarking, TPM, Quality by Design, Products Liability, and IT.

INTRODUCTION

Definitions

When the term *quality* is used, we usually think of an excellent product or service that fulfills or exceeds our expectations. These expectations are based on the intended use and the selling price. For example, a customer expects a different performance from a plain steel washer than from a chrome-plated steel washer because they are different grades. When a product surpasses our expectations, we consider that quality. Thus, it is somewhat of an intangible based on perception.

Quality can be quantified as follows:

$$Q = \frac{P}{E}$$

where Q = quality

P = performance

E = expectations

If Q is greater than 1.0, then the customer has a good feeling about the product or service. Of course, the determination of P and E will most likely be based on perception, with the organization determining performance and the customer determining expectations. Customer expectations are continually becoming more demanding.

The American Society for Quality (ASQ) defines *quality* as a subjective term for which each person or sector has its own definition. In technical usage, *quality* can have two meanings: the characteristics of a product or service that

bear on its ability to satisfy stated or implied needs, or a product or service that is free of deficiencies.¹

A more definitive definition of quality is given in ISO 9000. It is defined there as the degree to which a set of inherent characteristics fulfills requirements. *Degree* means that quality can be used with adjectives such as *poor*, *good*, and *excellent*. *Inherent* is defined as existing in something, especially as a permanent characteristic. *Characteristics* can be quantitative or qualitative. *Requirement* is a need or expectation that is stated; generally implied by the organization, its customers, and other interested parties; or obligatory.

Quality control is the use of techniques and activities to achieve and sustain the quality of a product or service. *Quality improvement* is the use of tools and techniques to continually make the product or service better and better.

Statistical quality control (SQC) is the collection, analysis, and interpretation of data for use in quality activities. *Quality assurance* is all the planned or systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. It involves making sure that quality is what it should be. This includes a continuing evaluation of adequacy and effectiveness with a view to having timely corrective measures and feedback initiated where necessary.

A *process* is a set of interrelated activities that uses specific inputs to produce specific outputs. The output of one process is usually the input to another. Process refers to both business and production activities. *Customer* refers to both internal and external customers, and *supplier* refers to both internal and external suppliers.

QUALITY IMPROVEMENT TOOLS

Quality improvement is not the responsibility of any one person or functional area; it is everyone's job. It includes the equipment operator, the keyboard operator, the purchasing agent, the design engineer, and the president of the company. There are many improvement tools to assist the organization and individuals to improve their product or service.

¹Dave Nelson and Susan E. Daniels, "Quality Glossary," *Quality Progress* (June 2007): 39–59.