

Index

Note: Page numbers followed by “*n*” with numbers indicate footnotes.

- Absolute frequencies, 38
- AccountAbility 1000 (AA 1000), 278–279
- Actions, 179
 - plan development, 71–72
- Affinity diagram (*see* KJ technique)
- Alternative hypothesis, 49
- American Productivity and Quality Center (APQC), 104
- Analysis of variance (ANOVA), 161, 163–164
- Analytic hierarchy process (AHP), 87
- Analytical benchmarking, 103–104
- Andon* systems, 147
- Annex SL in ISO/IEC Directive, 217–218, 262
- Antecedents, 203–207
- Antecedents–process–consequences framework, 203
- Approval and publication, 191
- Artificial performance optimization, 167
- Audit(s), 191
 - certification, 240
 - criteria, 256
 - external, 191
 - initial, 240
 - internal, 191, 238
 - preliminary, 240
 - second-party, 191
 - surveillance, 240
 - third-party, 191
- Autonomation, 147–148
- Balanced scorecard (BSC), 55–56
 - communication and connection, 63–66
 - incentive schemes, 66
 - measurement perspectives, 56–62
 - overcoming design issues, 73–74
 - overcoming implementation problems, 74–75
 - overcoming usage issues, 75–76
 - personal, 66
 - performance management through, 66–73
 - strategy map, 62–63
 - success, 73–76
 - theoretical bases, 55–57
- Balanced standards, 190
- Basic attributes (B), 86

- Benchmarking, 91
 - analytical, 103–104
 - approaches, 95–98
 - characteristics, 94–95
 - methodology for
 - implementation, 100–106
 - object, 98–100
 - origins and evolution, 92–94
 - PDCA cycle, 104–106
 - synthetic, 100–103
- Bernoulli random variable, 42
- Best practices, 103
 - benchmarking, 95
- Binomial distribution, 43
- Black belt (role), 155
- “Black box” process, 176
- Box and whiskers plot (Boxplot), 39–40
- British Standard Institution, 16, 187, 200, 246
 - BS 5750 standards, 187
 - BS 7799–2: 1998 “*Information security management system—Specifications*” standard, 246
- Bureau Technique (BT), 190
- Business
 - evaluation systems, 57
 - excellence models, 17–18
 - objectives, 171
 - processes, 209–210
 - strategy in daily operations, 71
- Business Process Management Software, 181
- Business process reengineering tools (BPR tools), 98
- Business-to-business (B2B), 10
- Buyer’s risk (*see* Consumer risk)
- “Catch-up growth” process, 9
- Causal relationships, identification of, 67–70
- Cause–effect diagrams, 160
- Certification (*see also* International Organization for Standardization (ISO))
 - audit, 240
 - body, 239
 - OHSMS, 239–241
 - process, 191–193, 204
- Champion (role), 154–155
- Chemical sector, 212
- Chi-square distribution, 45
- Child labor, 266–267
- China Social Compliance 9000 for Textile and Apparel Industry (CSC9000T), 279
- “Classic” statistics-based quality, 18
- Coercive power, 29–30
- “Cogent” documentation, 195
- Coherence, high strategic, 211
- Collective bargaining, right to, 268–269
- Communication, 74
 - of BCS, 63–66
 - for ISMS, 254
 - of objectives and measures, 64
 - SA 8000 standard, 275–277
 - systematic, 208–209
- Competitive benchmarking, 93, 96
- Comprehensive benchmarking project, 95
- Compulsory certificate, 188
- Confidence intervals, 47–48
- Consumer risk, 50
- Context, 221
 - of organization, 218, 249–250
- Continuous distribution, 43
- Continuous process improvement (CPI), 131
- Control limits, 51–52

- Corporate image and reputation, 210
- Corporate social responsibility (CSR), 18, 265
 - standards/codes of conduct, 278–279
- Correlation
 - analysis, 241
 - coefficient, 41
 - matrix, 41, 81, 88–89
- Cost, 164
 - of certification, 205
- Council on Economic Priorities
 - Accreditation Agency, 265
- Critical components
 - characteristics, 79
- Critical product requirements, 79
- Critical to quality (CTQ), 158
- Criticality, 30
- Customer, 31, 194
 - perspective, ISO 14001, 210–211
 - perspective of BSC, 59–60
- Customer requirements, 79–80, 87
 - identification, 81–83
- Customer satisfaction, 109
 - analyses, 109
 - analysis of results, 115
 - data collection, 113–114
 - planning of methodological aspects, 111–113
 - preliminary analysis, 110–111
 - SERVQUAL method, 115–116
- “Dantotsu”, 91
- Data
 - envelopment analysis, 209
 - sources and analysis level of benchmarking, 97–98
- Data collection, 113–114
 - methodology, 112
 - sheet, 161–162
- Defect-free products, 12
- Define, measure, analyze, improve, control methodology (DMAIC methodology), 155–165
- Degrees of freedom, 45
- Demanded quality chart, 82
- Deming cycle, 104, 106, 220–221, 239
- Deming Prize, 11, 14
- Democracy, 188
- Density function, 46
- Dependent variable, 50
- Deployment of expected quality, 84–87
- Descriptive statistics, 35–36
 - graphical representations, 38–41
 - summary statistics, 36–38
- Design for six sigma (DFSS), 155
- Design of Experiment (DOE), 161, 163–164
- Detection (D), 119, 121
 - from customer’s point of view, 122
- Development teams, 170, 174
- Disciplinary procedures, 269–270
- Discrete probability distributions, 42
- Discrimination, 269
- Dispersion
 - diagram, 40
 - indexes, 37
- Documentation, 195
 - document writing, 190
 - documented information, 254
- Economic development of headquarters’ region, 206
- Economic lot of production, 142–143
- 80/20 rule (*see* Pareto principle)
- Electrification, 6

- Employees, 24–25, 28, 31
 - designated, 7
 - involvement of, 211
 - SA 8000 representative, 272
 - “EN” standards, 190
 - “END” standards, 190
- Engineering characteristics, 80, 83
- Environmental legal requirements, 204
- Environmental Management System (EMS), 199–200, 212
- Ergonomics, 132
- Estimation error, 47–48
- European Committee for Standardization, 189–190
- European Foundation for Quality Management, 15
- European standard (EN), 188
- Event Tree Analysis, 10
- Evidence-based decision-making, 195
- Excitement attributes (E), 86
- Expected value for continuous variable, 42
- Explanatory variables, 50
- Exponential distribution, 45
- External audits, 191

- Failure mode and effect analysis (FMEA), 10, 117–118, 164
 - advantages and problems in, 125–127
 - construction, 123–125
 - risk perception and RPN, 118–122
- Fault detection analysis, 122
- Fault effect analysis, 120
- Fault Tree Analysis (FTA), 10
- Financial indicators, 55, 59

- Financial perspective
 - of BSC, 59
 - ISO 14001 certification, 210
- First Industrial Revolution, 6
- Fishbone diagrams (*see* Cause–effect diagrams)
- Fisher distribution, 45
- Five gap model (*see* SERVQUAL method)
- Five Ws and one H method (*see* Six Ws method)
- FLA Workplace Code, 279–280
- Flow chart representation, 178–179
- FMEA Team Start-Up Worksheet, 123
- Forced labor, 267
- Formal (ineffective) implementation of ISO 14001, 205
- Freedom of association, 268–269
- Frequency
 - absolute, 38
 - density, 38
 - distribution, 38
 - relative, 38–39
- Functional benchmarking, 96
- Functions (departments), 167–168

- Gamma distribution, 45
- Gap model, 109
- Gaussian distribution, 43
- Generic benchmarking, 96
- Global benchmarking, 93–94
- Global Compact (GC), 278–279
- Global Reporting Initiative (GRI), 278–279
- Government procurement standards, 16
- Graphical form, 178

- Graphical representation, 178–179
- Green belt (role), 155
- Hazards, 223, 225
- Health and safety, 268
- Heijunka* (see Production leveling)
- Hierarchical cluster analysis, 82
- High Level Structure (HLS), 246–247
- Histogram, 38–39
- Historical series, 53–54
- House of Quality (HoQ), 79–81
 - attributes, 84–87
 - compiling correlation matrix, 88–89
 - compiling relationship matrix, 83–84
 - customer requirement identification, 81–83
 - deployment of expected quality, 84–87
 - for design of folding chair, 82
 - engineering characteristics identification, 83
 - technical comparison, 88
- Human capital, 61
- Human factor, 225
- Human resources, 196
- Hypothesis
 - testing, 163–164
 - verification, 48–50
- If–then type function, 62
- Independent scoring method, 88
- Independent variables, 50
- Indicator(s), 181
 - building, 183–184
 - choice, 183
 - development and maintenance, 185–186
 - implementation of indicator system, 185
 - representation, 184
- Indifferent attributes (I), 87
- Industrialization, 4–5
- Industry rivals, implementation timing relative to, 212
- Inferential statistics, 35, 45
- Information, 179
 - capital, 61
 - security policy, 251
- Information Security Management System (ISMS), 245, 249
 - communication for, 254
 - measurements, 256
 - process scheme to set up, 261–262
- Infrastructure resources, 196
- Initial audit, 240
- Intangible assets, 28
- Integrated management system (IMS), 262–263, 278
- Internal audits, 191, 241, 255–256
- Internal benchmarking, 96
- Internal business processes
 - perspective of BSC, 60–61
- International Declaration of Human Rights, 266
- International Electrotechnical Commission (IEC), 189, 246
- International Labour Organization Conventions (ILO Conventions), 266–267
- International Organization for Standardization (ISO), 15, 187–188, 201, 218, 246
- Interquartile range (IQR), 37
- Investors, 31

- Ishikawa diagrams (*see* Cause–effect diagrams)
- ISO 14001 standard, 199, 278
 - antecedents, 203–207
 - consequences on performance, 209–212
 - EMS, 200
 - ISO 14001:2015 standard, 201–202
 - ISO 14001 certification process, 212–213
 - literature review, 202–203
 - process, 207–209
 - series, 200
- ISO 26000 certification, 278–279
- ISO 31000 “Risk Management” standard, 252
- ISO 45001 standard, 217–218
 - Annex SL, 217–218
 - benefits of adopting OHSMS, 241–243
 - certification of OHSMS, 239–241
 - Deming cycle, 219
- ISO 9000 standard, 196–198, 278
 - admitted exclusion, 196–197
 - areas of innovation, 195–197
 - background, 187
 - benefits from ISO 9000’s implementation, 197
 - bodies, 189–190
 - certification process, 191–193
 - documentation, 195
 - outsourcing, 197
 - process, 190–191
 - quality management principles, 194–195
 - readability and comprehension, 195–196
 - resources management, 196 and value, 187–189
- ISO 9000:2015, 249
- ISO/IEC 17021:2006 standard, 192
- ISO/IEC 27000 standard, 248, 252, 255
- ISO/IEC 27001 standard, 245–246
 - appendix A, 258–259
 - benefits of application, 259–260
 - certifications, 260
 - context of organization, 249–250
 - history, 246–248
 - improvement, 257
 - integrated management system, 262–263
 - leadership, 250–251
 - operation, 255
 - performance evaluation, 255–257
 - planning, 251–253
 - process scheme to set up ISMS, 261–262
 - scope, 249
 - structure, 248–259
 - support, 253–254
- ISO/IEC 27002 standard, 247
- ISO/IEC 27003 standard, 248
- ISO/IEC 27004 standard, 248
- ISO/IEC 27005 standard, 248
- ISO/IEC 27006 standard, 247
- ISO/IEC 27007 standard, 248
- ISO/IEC 27009 standard, 247
- ISO/IEC TR 27008 standard, 248
- Japanese Union of Scientists and Engineers (JUSE), 11
- Jidoka* (*see* Autonomation)
- Joint technical committee 1 (JTC 1), 246
- Just-in-time (JIT), 130, 139–140
 - delivery of purchases, 146–147
 - economic lot of production and SMED, 142–143

- line balancing, 142
- production, 139–149
- production cells and
 - multiskilled workers, 143–145
- production leveling, 140, 142
- pull system and Kanban system, 145–146
- relationship matrix between practices and, 141
- Takt time, 140
- workplace organization, 145

- Kaizen (*see* Continuous process improvement (CPI))
- Kanban system, 145–146
- KJ technique, 82

- Labor
 - child, 266–267
 - forced, 267
- Leadership, 154, 194, 202
- Lean
 - enterprise, 133–139
 - organizational model, 133
 - production, 129, 131, 134
 - supply chain, 130, 136
- Lean management, 129–131
 - elements of Toyota’s production system, 139–149
 - lean enterprise, 133–139
 - origins and traits, 131–133
- Lean Thinking* (Womack and Jones), 130
- Learning, 61–62, 94, 136
- Least squares method, 51
- Legitimacy of stakeholders, 29
- Life cycle assessment (LCA), 202, 208
- Lifetime distributions, 45
- Line balancing, 142

- Linear regression model, 50
- Logical security, 245
- Lower control limit (LCL), 51

- Malcom Baldrige National Quality Award (1987), 14–15
- Management review process, 236, 272
- Management system, 243, 271–274
- Mass production, 6, 129–130, 134
- Master production schedule (MPS), 145
- Mathematical model, 45
- Measurement perspectives of BSC, 56, 58
 - customer perspective, 59–60
 - financial perspective, 59
 - indicators for business to business services company, 58
 - internal business processes perspective, 60–61
 - learning and growth perspective, 61–62
- Median, 37
- Memory of Meeting, 254
- Mindset, 12, 129
- Modus operandi, 12, 89, 117, 129, 133
- Multiskilled workers, 143–145
- Mutual consent, 188

- National standard, 188
- Natural variability, 51
- Non-compliance, 257
- “Non-fulfilment of requirement”, 257
- Non-quality cost, 197
- Normal distribution, 44–45, 47
- Normative power, 29–30

- North Atlantic Treaty
 - Organization, 187
- Null hypothesis, 49
- Numerical variables, 38
- Objective evaluation matrix,
 - 171–172
- Observed significance level, 50
- Occupational health and safety (OHS), 217, 222–223
- Occupational health and safety management system (OHSMS), 217–218
 - Annex, 221
 - benefits of adopting OHSMS and benefits of certification, 241–243
 - certification, 239–241
 - Deming cycle, 239
 - example of objectives program, 229
 - example of risk assessment criterion, 226–227
 - extract from internal audit checklist, 237
 - flow chart for fire emergency management, 235
 - internal audit program, 238
 - OHS performance, 228
 - organizational chart, 231
 - planning phase, 223
 - requirements and implementation, 220–239
 - safety policy, 224
 - scale of risk mitigation interventions, 225
 - SMART, 230
 - training program, 232
 - work permit, 233–234
- Occurrence (O), 119–120
- One-dimensional attributes (O), 86
- Operational benchmarking, 95–96, 98
- Operational controls, 201–202, 233
- Operational tools, 174–176
- Opportunities, 223, 228
- Optimized process redefinition, 170
- Organizations, 167
 - capital, 61
 - charts, 174n3, 231
 - modeling, 171–173
 - security, 245
- “Out of control” process, 52–53
- Outcome measures, 71
- Outliers, 37
- Overall performance index, 183
- p*-value, 50
- Pareto principle / diagram, 9, 38–39
- Part/subsystem deployment matrix, 79
- Partners, 28, 133, 136
- Percentile, 37
- Performance benchmarking, 95, 98–99
- Performance drivers’ measures, 71
- Performance indicators, 70–71
- Performance management
 - through BSC, 66
 - action plan development, 71–72
 - articulating company’s strategy, 67
 - identification of causal relationships, 67–70
 - performance indicators, 70–71
 - reporting system creation, 72–73
 - strategic objectives for “facility management office”, 68–69

- PESTLE analysis, 221
- Philosophy, process, people, partners, and problem solving model (4P model), 133–139
- Physical security, 245
- Plan-Do-Check-Act cycle (PDCA cycle), 9, 104–106, 194, 200, 219, 245
 - and methods, 208–209
- Planning and implementation of SA 8000 standard, 272
- Poisson distribution, 42
- Poka-yoke, 135, 147
- Polarization of perspectives, 17–18
- Population, 36
- Position indexes, 36–37
- Practice benchmarking, 99
- Preliminary audit, 240
- Probability, 41
 - density of normal distribution, 44
 - distributions, 42–45
 - of failure analysis, 121
 - function, 42
 - plots, 47
- Problem-solving process, 139
- Process approach, 167, 170, 194, 278
 - obstacles and benefits of, 176–178
- Process indicators, 181–183
 - building indicator, 183–184
 - choice of indicators, 183
 - example of matrix for identification, 182
 - implementation of indicator system, 185
 - representation of indicators, 184
- Process mapping
 - development team and process owner, 174
 - methods, tools, languages, and rules, 179–181
 - operational tools and practical guidance, 174–176
 - organization modeling, 171–173
 - process identification, 169–170
 - processes, functions, and procedures, 167–168
 - and risk-based thinking, 181
 - textual and graphical representations, 178–179
- Process(es), 167–168, 207–209
 - benchmarking, 93
 - criticality matrix, 171, 173
 - identification, 169–170
 - managers, 170
 - owner, 174
 - planning matrix, 79
 - process/quality control matrix, 79
 - quality, 3, 12
 - and quality control parameters, 79
- Producer risk, 50
- Product
 - design matrix, 80
 - planning matrix, 79
 - quality, 2–3, 6
- Production cells, 143–145
- Production leveling, 140–142
- Productivity, 7
- Project development teams, 155
- Public communication phase, 191
- Pull system, 145–146
- Push systems, 145
- PYX4 software tool, 179–180

- Qualigram method, 179
 - qualigram pyramid, 180
- Qualitative variables, 36
- Quality, 1–3
 - chart, 77, 82
 - gurus, 14
 - history, 4–5
 - of idea, 2, 6, 12
 - of impact, 3, 18
 - markets and approaches, 9–13
 - meanings, 4, 6, 10, 12, 18
 - planning, 84
 - principles, 181
 - standards, 187
 - strategy, 17
 - tables of QFD, 79
 - of technical realization, 2, 6, 8, 10
 - at time of industrial revolution(s), 5–7
 - at turn of millennium, 17–18
 - Western Quality Movement, 14–17
 - after World War II, 7–9
- Quality assurance (QA), 10
- Quality control (QC), 8–9
 - charts, 51–53
- Quality function deployment (QFD), 77–78, 158
 - advantages and problems in application, 89–90
 - House of Quality (HoQ), 80–89
 - instrument features, 78–80
- Quality inspection (QI), 5–7
- Quality management, 23, 91, 129
 - principles, 194–195
 - and quality insurance, 189
- Quality management system (QMS), 176, 191, 192n2
- Quantile, 37
- Quartiles, 37
- R software, 36, 38
- Random experiment, 42
- Random process (*see* Stochastic process)
- Random variable, 42
- Range of variation, 37
- Readability, 195–196
- Regression, 50–51
- Relationship, 175
 - digraph, 89
 - management, 195
 - matrix, 80, 83–84
 - Network diagram, 89
- Relative frequency, 38–39
- Relative-importance ranking, 87
- Relevance theory of stakeholders, 29–31
- Remuneration, 28, 270–271
- Reporting system creation, 72–73
- Resistance to change, 74
- Resource management, 196
- “Responsible Care” program, 200
- Revealed Preference techniques, 87
- Reverse attributes (R), 87
- Reverse Engineering and product competitive analysis, 93
- Risk priority number (RPN), 118–122, 164
- Risk(s), 218, 223
 - analysis, 252
 - assessment, 223, 226–227
 - management, 259
 - perception, 118–122
 - risk-based planning and controls, 201
 - risk-based thinking approach, 181, 218

- SA 8000 standard, 265–266
 - advantages and obstacles, 275–277
 - analysis with ISO 9001 and ISO 14001 certification, 278
 - and other CSR standards/codes of conduct, 278–279
 - structure, 266–274
- Safety management system, 241
- Safety policy, 224, 241
- Sample, 36
 - selection, 111
 - size, 36
 - variance, 37, 47
- Scatter plot, 41–42
- Scorecards, 100–101
- Second Industrial Revolution, 6
- Second-party audits, 191
- SERVQUAL method, 18, 115–116
- Severity (S), 119–121
- Shareholders, , 24–25, 28
- Shewhart charts, 51
- Shojinka*, 143–145
- Situational factors, 103
- Six sigma method, 18, 153
 - DMAIC methodology, 155–165
 - history, 154
 - supporting structure, 154–155
- Six Ws method, 175
- Small and medium enterprises (SMEs), 15
- SMED system, 142–143
- Social Accountability
 - International, 265
- Social factor, 225
- Social responsibility requirements
 - of SA 8000 standard
 - child labor, 266–267
 - disciplinary procedures, 269–270
 - discrimination, 269
 - forced labor, 261
 - freedom of association and, 268–269
 - health and safety, 268
 - management system, 271–274
 - remuneration, 270–271
 - right to collective bargaining, 268–269
 - working hours, 270
- Sort, straighten, shine, standardize and sustain method (5S method), 145
- Specific, Measurable, Attainable, Relevant, Time-bound (SMART), 230
- Stakeholders, 23, 26–29, 194
 - companies and, 24–25
 - engagement, 274
 - involvement, 211
 - legitimacy of, 29–30
 - power of, 29–3
 - principles of stakeholder management, 31–33
 - relevance, 29–31
- Standard(s) (*see also* International Organization for Standardization (ISO))
 - bodies, 189–190
 - deviation, 37
 - error, 47
 - normal distribution, 44
 - process, 190–191
 - and value, 187–189
- Statement of Applicability (SoA), 253, 262
- Statistical inference techniques, 46
 - confidence intervals, 47–48
 - hypothesis verification, 48–50
 - regression, 50–51
- Statistical process control (SPC), 8
- Statistical test, 49

- Statistical tools, 35, 163
 - advanced techniques, 51–54
 - descriptive statistics, 36–41
 - inferential statistics, 45
 - probability, 41–45
- Statistical units, 36
- Statistics, 36
- Stochastic control, 53–54
- Stochastic process, 53–54
- Strategic/strategy, 171
 - benchmarking, 93
 - deployment, 71
 - learning, 72
 - map, 56, 59, 62–63, 69–70
 - proactivity, 206
- Structured process, 91
- Student's *t* distribution, 45
- Subcontractors control, 272–273
- Substitute quality characteristics, 83
- Subsuppliers control, 272–273
- Summary statistics, 36–38
- Suppliers, 28
 - control, 275–276
- Suppliers, Input, Process, Output, and Customers scheme (SIPOC scheme), 159–160
- Supply chain, 81, 204
- Surveillance
 - audit, 240
 - visits, 192
- Synthetic benchmarking, 100–103
- System approach, 278
- System boundaries, 170
- Systematic communication with stakeholders, 208–209
- Systematic variability, 51
- Takt time (Tt), 140
- Tangible assets, 28
- Targets, 64–66
 - customer satisfaction value, 87
 - values, 183
- Team-based approach, 208
- Technical Committee Management Board, 190
- Technical Committees (TC), 189
- Technical Management Board (TMB), 189–190
- Technical rules, 188
- Technical standards, 188
- Test statistics, 49
- Textual representation, 178–179
- Third-party audits, 191
- Time
 - schedule, 113
 - sensitivity, 30
 - series (*see* Historical series)
- Top management, 133, 140, 207–208
 - commitment, 211
- Top-down approach, 169–170
- Total Productive Maintenance (TPM), 148–149
- Total quality control (TQC), 11–12, 14
- Total quality management (TQM), 14–15, 208
- Toyota way, 133
- Toyota's production system elements, 139
 - autonomation, 147–148
 - JIT, 139–147
 - Toyota partnership model, 136–137
 - TPM, 148–149
- Trade-offs, 81, 8389
- Training program, 232
- Transparency, 188
- Tree of customer's satisfaction, 114
- Type I error, 50

Type II error, 50
UN International Convention on
Rights of Child, 266
Universality, 101
Universe (*see* Population)
Upper control limit (UCL), 51
Urgency of stakeholders, 30–31
US companies, 10–11, 13, 92
US Military Specification (MILQ-
9858), 187
US Technical Advisory Group,
201
Utilitarian power, 29–30
Value creation model, 24
Variability, 51
Variance for continuous variable, 42
Vision 2000, 194–195
Voice of customer, 83
Voice of engineer, 83
Voluntary certificate, 188

Weibull distribution, 45
Western Quality Movement, 14–17
Work environment resources, 196
Work in progress (WIP), 132
Workplace organization, 145