

Index

- accidents, 262, 267, 270
- actuarial methods, 128
- adaptation rules, 103, 117
- adaptive testing, 102
- Advanced Measurement Approach (AMA), 129, 161, 171, 173, 177, 217
- association rules, 108, 149, 152, 154, 160, 162
- Balanced Scorecards (BSC), 34, 218
- Basel II, xv, 19, 20, 56, 127, 128, 161, 218, 223
 - Basel II Capital Requirement Directive, 79, 160, 172, 173, 200, 201, 205, 214, 217
 - pillar, 2 172, 177
- Bayesian inference, 100
- Bayesian networks, 30, 100, 102, 118, 173, 187–188, 195
- black swan, 16, 101, 166, 256, 258, 274
- Business Intelligence (BI), 61
- Business Motivation Model (BMM), 217, 218, 222–236
- business process, 217, 222–225, 232–235
- Business Process Execution Language (BPEL), 247
- Business Process Management (BPM), 216–217, 229–231
- Business Process Modelling, 225
- Business Process Modelling Notation (BPMN), *see* Business Process Modelling
- business risk, 172
- business rule, 216–219, 221–226, 236
- capital at risk
 - operational, 171, 175, 177
- cause and effect link between an IT event and a reported loss, 184, 192, 195
 - threshold probability, 184, 192
- Chief Risk Officer (CRO), 4, 7, 14, 15
- clustering
 - to define classes and mapping, 179
 - compliance, *see* regulatory compliance
- computer-aided data system, 200
- conditional probability, 150, 151, 179, 181, 187–188
- Conditional Random Fields (CRF), 64
- confidence, 150–152, 154
- consequence of a failure, 103

- contingency table, 151, 152, 156
- credit management, 138, 200, 201, 204
- critical path of operational events, 173, 176, 183, 187–188, 189, 195
- data integration, 6, 242
- data management, 202, 272
- data merging, 87, 89, 137, 155
- democratisation of risk management, 239
- dependency analysis, 111, 113
- directives, 218–219, 222–223, 225–226, 229, 232, 236
- Design of Experiments (DoE), 100
- Disaster Recovery Plan (DRP), 11
- domain knowledge, 50, 216, 219, 220, 229, 232
- early warning system, 173, 175–176
- Economics, 273
- Econophysics, 273
- Enterprise Risk Management (ERM), 9, 10, 14, 15, 216–217, 223–226, 235–236, 240, 242–244
- Extract, Transform and Load (ETL), 80–85, 91, 95
- failure
 - hardware failure, 86, 156
 - interface failure, 86
 - network communication failure, 86
 - security failure, 86
 - software failure, 86, 156
- failure probability, 86, 103, 110, 222, 232, 236–237
- financial risk, 161, 209, 211, 213
- Financial Risk Management (FRM), 5, 199, 243
- Financial Services and Insurance industry (FSI), 239
- Food and Drug Administration (FDA), 5, 261, 262
- fraud protection, 199, 208, 213
- General Architecture for Text Engineering (GATE), 62, 65
- governance, 215–218
- Gini coefficient, 201, 206, 208
- group testing, 100, 104, 114
- Hidden Markov Models (HMM), 64
- incidents, 179, 182, 262, 271
- Information and Communications Technology (ICT), 10, 42, 242
- Information Extraction (IE), 61, 62, 73, 180, 185, *see also* semantic analysis of reported events and losses
- Information Quality (InfoQ), 6, 163
- Integrated Risk Check-up System for Enterprises (IRCSE), 245–248
- integrated risk self-assessment, 245
- integration of different risk categories, 242, 249
- Intelligent Regulatory Compliance (IRC), 215–238, 266
- interest measures, 150, 153, 154
- ISO 17799:2005, 127
- IT event, 171, 174–178, 180, 183, 185, 189
 - classes for near misses / opportunity losses, 178–181, 183, 186–187, 189, 225–227, 230–231, 237
 - concurrently necessary events, 179, 181–183, 186–188, 194
 - sufficient for an operational loss, 179, 182, 186–187, 192, 194

- item set, 150, 153
- Key Risk Indicators (KRI), 27,
 - 103, 172, 173, 176, 178,
 - 194, 195, 227, 244
 - in currency units, 173, 177–178,
 - 182–183, 194–195
- knowledge modelling, 43–47, 227
- lift, 151, 154, 155
- likelihood estimate, 180–181, 182,
 - 189–194
- logistic regression, 139, 142
- loss approach level, 178, 181–183,
 - 187, 189
- loss data collection, 185, 186, 192,
 - see also* Statistical analysis of recorded loss data
- Loss Distribution Approach (LDA),
 - 32, 222–223
- loss event, 29, 56, 129, 178, 186,
 - 222–227, 229, 231–232,
 - 237
- loss given default, 199
- low level event, 173, 176, 195
- mapping between classes of IT
 - events and operational losses, 179, 180, 182,
 - 189, 231–237
- merged score, 140
- merging data, 155
- missed business opportunity, 174,
 - see* opportunity loss
- mitigation strategy, selection, 173,
 - 195–196, 229, *see also* risk mitigation,
 - prioritization of risk-mitigating controls
- Model Driven Architecture (MDA),
 - 237
- multiple-effect loss, *see* multiple loss
- multiple loss, 172–173, 177, 184,
 - 195, 225–227, 234
 - example in a banking context, 177
 - reconnection of separated losses, 184, 192–194
- MUSING, xv, 5, 10, 16, 30, 42, 58,
 - 74, 80, 121, 141, 171,
 - 172, 214, 237, 242, 249,
 - 274
- named entity recognition, 63, 64,
 - 69
- natural language parsing, 70
- Natural Language Processing (NLP), 61
- near loss, 175, 242, 267, *see* near miss
- near miss, 171–172, 175,
 - 177–180, 189, 194–195,
 - 225–227, 234, 242,
 - 266
 - combined weight, 189–194
 - example in a banking context, 175–176
 - quantification, 181–183
- near miss / opportunity loss
 - service, 172–173,
 - 189–194, 225–227
 - batch processing, 185–186
 - methodology, 172–173,
 - 177–183, 184–186,
 - 234
 - on-line processing, 172–173,
 - 185
- non recorded loss, 174–177,
 - 195–196
- non-IT operational event, 174, 196
- Object Management Group (OMG),
 - 186, 216–221, 225, 229,
 - 236, 250
- occupational injury, 268, 270
- ontologies, 41, 102, 105, 108, 111,
 - 186, 244, 250
 - dedicated to IT OpR, 172, 185,
 - 186–187, 223

- ontology-based information
 - extraction
- Ontology Web Language (OWL), 45, 71, 223
- operational loss, 175–176, 178, 181–183, 184, 188, 192–194
 - Basel II definition, 20, 174–175, 177, 181, 223
 - classes for near misses / opportunity losses, 179–182, 186–187, 189, 192–194
 - cumulative for multiple losses, 184, 192–195
 - probability distribution, 181–183, 185, 186, 192–194
- operational risk, 19, 20, 79, 160, 161, 199, 213 214, 235–236, 264, 272
- Operational Risk Management (OpR), xv, 5, 19, 56, 79, 171, 239
- operational score, 137, 140, 272
- opportunity loss, 171–172, 174, 180, 194–195, 225–227, 234
 - example in a banking context, 174–175
 - probability distribution, 180–183, 186, 187, 192–194
 - quantification, 180–181, 192–194
- Parts-of-Speech (POS) Tagging, 67
- PAS56, 127
- Pentaho Data Integrator, 80, 83, 84, 92, 95
- policy, *see* directives
- principal components
 - analysis, 129, 143
 - transformation, 139, 270
- Private Branch Exchanges (PBXs), 249
- probability of default, 201, 203, 205, 208, 209
- Proton, 43, 45, 47, 58
- qualitative data, 102
- quality, 253, 255, 259, 260
- quality ladder, 258, 261, 274
- quantitative data, 102
- rating system, 200, 202, 208
- reasoning, 45, 189, 192
- regulation, 215–219, 222, 225
- regulators, 267
- regulatory compliance, 215–217, 225–227, 235–237
- Relative Linkage Disequilibrium (RLD), 151, 157, 163–165
- reporting threshold, 176
- reputational risk, 20, 172
- risk appetite, 243
- risk assessment, 107
- risk audit, 11, 13
- risk based testing, 100, 103, 114
- risk cause, 8, 161, 267
- Risk and Control Assessments (RCA), 3, 25, 26
- risk event, 8, 25, 128, 154, 267
- risk event capture, 25
- risk event repository, 23, 25, 34
- risk factor, 161, 178, 267
- risk identification, 22, 267
- risk impact, 8, 267
- risk likelihood, 8, 30
- risk management, 4, 10, 35, 243, 273
- risk management services value chain, 240–241, 273
- risk mitigation, 29, 273, *see* mitigation strategy
 - prioritization of risk-mitigating controls, 173, 177, 188, 195–196

- risk modelling, *see* risk ontology, 30
- risk ontology, 42, 54
- risk score, 250
- risk services value chain, 241
- risk silos, 11
- Rule-based Systems, 115, 117, 121

- safety management, 262, 266, 270, 273
- Semantics of Business Vocabularies and Business Rules (SBVR), 217–222, 225–229, 236
- scenarios, 33, 180
 - scenario analysis, 173, 180, 181, 185–186, 192, 272
- scorecard, 34, 130, 133, 201, 203, 204
- scoring system, 127, 204, 206, 207
- self-assessment, 250
 - to define classes and mapping, 179, 181
- semantic analysis of reported events and losses, 172, 179, 180, 184, 185, 189
- semantic technology, 250
- semantic-based technologies, 61, 240
- semantic web, 5, 62, 71, 107
- Service Oriented Architecture (SOA), 99
- simplex representation, 152, 162, 163
- Six Sigma, 253, 255

- Small and Medium sized Enterprise (SME), 139, 240, 242, 246
- Software as a Service (SaaS), 241
- software reliability, 102
- solvency, 204–206
- Solvency II, 19
- statistical analysis of recorded loss data, 173, 181, 185
- strategic analysis, 227
- statistical efficiency, 7, 261
- support measure, 150, 156, 166
- Support Vector Machines (SVM), 64

- temporal ontologies, 48
- test cases, 101, 104
- total customer risk, 250
- types of risk, 162

- uncertainty, 4, 255
- Uniform Markup Language (UML), 232
- upper ontologies, 42, 47, 50
- usage analysis, 114
- use based estimation, 114

- Value at Risk (VaR), 12, 182, 186
- Virtual Network Operator (VNO), 80, 84, 95, 217, 223, 249

- web services, 99, 104, 105, 172
 - WS-BPEL, 247

- XBRL, 45, 54, 62, 87, 137, 217
- XML, 65, 88, 91