

Index

A

Adaptive robotics, 3, 5, 7, 20, 48, 52, 97, 138
Agility, 5, 16, 17, 19, 61, 70, 108
Architectural framework, 251, 255, 256, 259, 263
AR hardware and software, 51, 66, 177, 189, 201, 212
Artificial intelligence, 3, 5, 7, 12, 17, 21, 85, 88, 97, 124, 125, 138, 187, 191, 198
Assembly, 7, 8, 11, 14, 46, 53–55, 194, 195, 197, 198, 204, 207, 211, 212, 222, 230, 258, 259
Augmented reality, 6, 10, 11, 16, 17, 20, 48, 52, 55, 141, 201, 239, 258
Automatic identification, 252, 263
Automation, 4, 14, 15, 43–46, 53, 54, 56, 65, 69, 123–126, 128, 132, 134, 137, 140, 146, 183, 197, 245, 257, 258, 267, 268, 278, 279

B

Barcode, 14, 52, 252, 253, 259, 263
Business model, 4, 20, 25–29, 31–33, 40, 65, 69, 70, 97, 106, 123, 125, 126, 134, 141, 174, 175, 182, 184

C

Cloud robotics, 192
Collaborative and cooperative working, 194
Collaborative operations, 201, 208, 209, 212
Computer aided design, 217, 228
Cyber-attacks, 267, 269, 270, 273, 275, 276, 278, 282
Cyber-physical robotics, 193
Cyber security, 5, 14, 15, 19–21, 145, 146, 267–270, 273, 275, 280, 282

D

Data analytics, 5, 6, 10, 13, 16, 17, 20, 32, 51, 52, 56, 85, 138, 140, 145, 146, 155, 156, 159, 163, 168, 170, 176, 268
Decentralization, 5, 16, 70
Developing new talent, 123, 126
Digital skills, 73, 76
3D modelling, 244, 245

E

Economic analysis, 12, 13, 17, 46, 52, 62, 106, 119, 159, 176, 241
Embedded systems, 4–6, 8, 14, 15, 17, 20, 25, 30, 140, 146, 182, 193
Engineering education, 137–139, 147
Entrepreneurship, 27, 139, 141, 144, 145

F

Forecasting, 155–157, 163
Future workforce, 123, 126–130, 133, 134

G

Global positioning systems, 253, 255, 263

I

Industrial challenges, 267, 270, 273
Industrial internet, 3, 5, 6, 12, 16, 17, 19, 20
Industry 4.0, 4–7, 9, 12, 13, 15–17, 19, 21, 43, 45, 46, 48, 50, 51, 55, 56, 61–66, 68–70, 76, 95, 97, 98, 102, 106, 108, 111, 119, 123, 126, 127, 129, 130, 132, 134, 137–142, 147, 155–157, 159, 170, 187–189, 191, 193, 194, 196, 197, 257, 268
Information technology, 3, 4, 87, 155, 187, 251, 267–269, 282

- Infrared, 179, 190, 254, 255
- Innovation, 4, 9, 28, 30, 95, 96, 100, 108, 124, 125, 127–130, 134, 139, 141, 144, 183, 227, 230, 273
- Integrated business processes, 5, 16, 19, 87
- Internet of robotic things, 192
- Internet of things, 4, 6, 12, 17, 25, 31, 97, 106, 125, 140, 155, 174, 175, 177, 183, 188, 236, 267, 270
- Interoperability, 5, 13, 16, 17, 20, 70, 184, 242
- IoT's value creation, 21, 31, 173, 176, 177, 179, 182, 184
- J**
- Just in time, 230
- K**
- Knowledge and skills, 137
- L**
- Lean production, 43–46, 52, 53, 55, 56, 258, 259
- Lifecycle analysis, 9, 178, 205
- M**
- Machine learning, 97, 124, 125, 138, 140, 145, 156–158, 162, 170
- Maintenance, 7, 8, 11–13, 16, 30, 45, 46, 52, 56, 106, 159, 184, 191, 192, 194, 197, 201, 203–207, 236, 239, 260
- Manufacturing, 3–9, 13, 17, 19, 21, 43, 45, 47, 48, 51, 53, 56, 106, 110, 128, 139, 146, 155–157, 161, 168, 170, 177, 188, 191, 194, 196, 198, 204, 213, 217, 218, 221, 225, 229, 230, 236, 238, 240, 241, 244, 246, 258, 259, 268, 273
- Maturity assessment, 63, 68, 98
- Maturity model, 61, 62, 65–68, 77, 93
- P**
- Planning horizon, 96, 97, 113
- Portfolio optimization, 107, 110, 111
- Predictive analytics, 51, 155–157, 163, 170
- Prioritization, 97–101, 106, 108–110
- Process development, 11, 98, 100
- Product development, 4, 6, 9, 11, 19, 29, 46, 72, 76, 82, 100, 111, 204
- R**
- Radio frequency identification, 245, 253, 259, 263, 268
- Readiness model, 62–64, 68
- Real data management, 5, 16, 17, 20, 70
- Real-time locating systems, 253, 254, 263
- Revenue stream, 25–29
- Risk, 29, 100, 107, 109, 126, 183, 245, 262, 273, 280, 282
- S**
- Scheduling, 52, 97, 98, 102, 236, 245, 259
- Security requirements, 272
- Service-driven, 25
- Service orientation, 5, 13, 16, 129
- Simulation, 5, 6, 11, 14, 16, 17, 20, 47, 48, 107, 111, 117, 192, 235–239, 241, 242, 244–247, 262, 268
- Skill requirements, 123, 127, 129, 134
- Smart agriculture, 177–179
- Smart city, 179
- Smart connected products, 21, 25, 26
- Smart health, 32, 181
- Societal impact, 109, 268
- T**
- Technology strategy, 20, 21, 27, 57, 64, 69, 96, 102, 109, 129, 182, 226, 230
- Traceability, 17, 81, 252, 255, 258, 260, 262, 263
- Tracking, 11, 14, 17, 125, 174, 190, 194, 195, 203, 207, 209, 211, 213, 252–254, 259, 272
- U**
- Ultrasound, 254, 255
- V**
- Value proposition, 25–29, 40, 61, 174
- Virtual factory, 236–241, 243, 244, 247
- Virtualization, 5, 16, 17, 20, 48, 83, 138, 237
- W**
- Waste, 9, 44, 45, 47, 48, 181, 228, 239
- Wearable technologies, 177, 180, 184
- Wireless sensor networks, 13, 254, 255, 268