

Index

- 1 G. *See* first-generation cellular telephone network
 2 G. *See* second-generation network
 3 G. *See* third-generation mobile network
 110 Volt, 148
 220 Volt, 148
- Abernathy, William J. and Utterback, James M., 217
- aboriginal weapons, 51
- ABS. *See* anti-lock braking system
- A-bulb, 153
- accessories, 80, 100, 107, 124, 127, 198
- accident, 10, 118, 172, 178
- accumulated change, 37
- accumulation of innovations, 44
- accumulation of knowledge, 61, 239
- action research, 91
- adaptation by natural selection, 54
- Adidas, 205
- administrative innovation, 16
- adolescent, 240
- advancing products, 62
- advertising, 100, 146, 182
- aesthetic appreciation, 228, 231
- aesthetic impression, 234
- aesthetic judgment, 231, 248
- affect, 236
- age category, 240
- air tire, 119
- airbag, 174
- Aldman, Bertil, 174, 192
- all-terrain bike(ATB), 127
- all-inclusive holiday, 137
- Altshuller, Genrich, 220
- American Telephone and Telegraph (AT&T), 102
- Ames, Jean Helen and Frederick John, 174, 192
- Amsterdam School, 131
- Anderson, Philip and Tushman, Michael L., 221
- ANEC. *See* Association for the Co-ordination of Consumer Representation in Standardisation
- animal well-being, 85
- annual report, 85
- anomaly, 75
- antecedent, 3, 36, 61, 227, 268
- anti-lock braking system (ABS), 174
- app, 111
- Apple, 7, 108
- appreciative theory, 64
- Archaea, 55
- archaeobacteria, 55
- archetype, 40, 248–249
- architectural innovation, 16
- architecture, 22, 224
- Ariel, 113, 117
- ARIZ, 24, 220
- Arke, Travel and Passage Agency, 139
- artefact, 4, 27, 30, 36, 48, 51, 56, 59, 120, 227, 251
- Artful Judgements*, 248
- asexual reproduction, 21
- assembly, 71, 78

Index

293

- Association for the Co-ordination of
 Consumer Representation in
 Standardisation, 187
 AT&T. *See* American Telephone and
 Telegraph
 ATB. *See* all-terrain bike
 atmosphere type, 149
 automatic assembly, 80
 automation, 80
 awareness phase, 23, 77, 84, 106, 110, 127,
 135, 144, 208
 AZERTY, 6
- Babymex Italiana, 180
 bacteria, 21–22, 225
 Bakelite, 94–95
 ballast, 154, 159, 161, 164, 224
 ban on incandescent light bulbs, 85
 bandwidth, 108
 barriers to adoption, 166
 Basalla, George, 36, 51, 226
 base, 62, 166, 268
 basic function, 30, 31, 33, 43–44, 49, 59, 78,
 79, 83–84, 88, 86, 111, 147, 160, 161, 168,
 174, 178, 183–184, 196, 224
 basketball shoe, 92, 203
 battery, 45
 battery electric vehicle (BEV), 68
 battle of standards, 148
 bayonet socket, 152
 Beautiphil, 98
 Bébé-Comfort, 189
 Beginning-Of-Life (BOL), 72
 behavior, 236
 Bell Laboratories, 102
 Bell, Alexander Graham, 102
 belt harness, 178, 182
 belt, safety, 174
 belt, self-applying, 174
 belt, three-point, 174, 182, 184, 192
 belts, safety, 184
 Bense, Max, 227
 Berlage, 131
 Berlyne, Daniel Ellis, 228
 best-adapted (species), 19
 best-adapted idea, 20
 best-adapted product, 44
 Betamax, 6, 62
 BEV. *See* battery electric vehicle
 bicycle, 45, 91, 113, 230
 Bicycle Motor Cross (BMX), 127
 bicycle, city, 125
 bicycle, folding, 125
 bicycle, hybrid, 125
 bicycle, racing, 125
 bicycle, sports, 124
 bicycle, tour, 125
 Bijker, Wiebe E., 169, 230
 biological evolution, 18, 19, 21–23, 76, 122,
 216, 225
 biomimetics, 22
 biomimicry, 23
 birth, 69
 BlackBerry, 109
 Bluetooth, 108
 BMX. *See* Bicycle Motor Cross
 body of knowledge, 230
 Bohlin, Nils, 174
 BOL. *See* Beginning-Of-Life
 booster cushion, 182
 Boselie, F.A.J.M., 231
 Bottom of the Pyramid, 11
 brainstorming, 64
 branch, 13, 33, 56, 57, 60, 62, 65, 191, 268
 brand preference, 261
 Braun, 98
 Braun, Ferdinand, 157
 breakthrough, 239
 breakthrough innovation, 169, 247
 Britax Römer, 189
 Brompton, 127
 Bronze Age, 35
 Bryant, Kobe, 207
 Bunny Bear Company, 173
 business-to-business, 80, 107, 217
- camera phone, 109
 candy bar, 104, 108
 capital intensive, 218
 Captain Gérard, 127
 car, 171
 car ownership, 172, 173, 183, 190, 195
 car safety, 194
 car safety features, 184
 car safety technology, 196
 carbon arc lamp, 151
 carbon filament, 151
 carbon filament incandescent lamp, 149

- carbon-neutral, 110
- career oriented, 241
- case study, 91, 171
- cathode, 154
- cell phone, 103
- CFL. *See* compact fluorescent lamp
- CFL-G1. *See* first-generation CFL
- CFL-G2. *See* second-generation CFL
- CFL-G3. *See* third-generation CFL
- CFL-halogen lamp, 164
- CFLi, 163
- CFL-LED lamp, 164
- changes in perception, 10
- charity, 110, 131, 242
- child car seat, 171
- child labor, 85
- child restraint system (CRS), 62, 92, 171, 224
- child safety, 171
- child-passenger safety advocacy group, 184
- children, 240
- Christensen, Clayton M., 232
- citizen-consumer paradox, 84
- clamshell, 108
- Claude, George, 154
- climate change, 160, 170
- cloning, 21
- clothes, 241
- Club of Rome, 155
- CNC. *See* computer numerical controlled
- coal-gas, 148
- cocreation, 83, 89, 207–208, 256
- cocreation workshop, 257
- cognition, 234
- coiled coil filament, 154
- collision, 178
- combinational evolution, 225
- convenience oriented, 254
- commercialization, 70
- commodity, 255
- compact fluorescent lamp (CFL), 92, 147, 224, 247
- compass, 107
- competence-destroying, 222
- competence-enhancing, 222
- competitive strategy (what), 11
- complex multicellular life, 55
- complexity, 78, 229
- components, 13, 25, 38–39, 42–43, 48, 59, 63, 100, 123, 154, 159, 162, 203
- computer, 260
- computer numerical controlled (CNC), 223
- computer technology, 42
- Consumentenbond, 166, 188
- Consumentengids*, 109, 166, 176, 182
- consumer association(s), 178, 188
- consumer electronics manufacturing, 159
- consumer guide, 178
- consumer preference, 73, 147, 170, 248, 250
- Consumer Reports*, 175, 178
- consumers, 41
- Consumers International, 188
- Consumers Union, 178
- context, 3, 23, 27, 29, 34, 41–45, 48–49, 52–53, 59, 62–66, 68, 119, 196, 245, 268, 269
- contextual influence, 63
- continuity, 227
- continuous technological change, 239
- convenience, 80
- conventional light, 158
- Converse, 205
- Cook, Thomas, 137
- Cool Skin, 98
- Coolidge, William David, 152
- Cooper, Martin, 102
- corporate responsibility, 85
- cosmopolitans, 255
- cost, 12
- cost (locus of innovation), 219
- cost reduction, 12, 223
- Coventry Machinists, 117
- Coventry Sewing Machine, 116
- cradle, 182, 192
- crane, 37
- crash test, 174, 178, 188
- creative destruction, 4
- creative processes, 64
- crisis, energy, 135
- crisis, midlife, 242
- crisis, oil, 155, 161, 247
- CRS. *See* child restraint system
- CRS legislation, 179
- cultural evolution, 18
- cultural heredity, 58

Index

295

- Da Vinci, Leonardo, 113
 DANA. *See* Drivers Appeal for National Awareness
 Danger Hiptop, 109
 Darwin, Charles, 53
 David, Paul A., 236
 Davis, Anthony, 211
 Davy, Humphry, 148
 dead end, 62
 decline, 69
 Democratizing Innovation, 257
 demographic criteria, 259
 demographic models, 74
 demographic shift, 10, 240, 247
 denotation, 248
 deoxyribonucleic acid (DNA), 18, 55
 descent, 52, 56, 61, 268
 design, 32
 design education, 265
 design history, 217
 design manager, 92
 design methodology, 3, 48, 217, 266
 design school, 244
 design strategy, 114, 212, 265
 design team, 250
 design variation, 14
 designer, 244
 development history of products, 64
 developmental configuration, 230
 diamond frame, 124
 diesel, 81
 diffusion of innovation, 7, 17, 239, 257
 digital camera, 109
 discontinuity, product, 222
 discontinuous leap, 2
 discontinuous technological change, 239
 disposable razor blade, 93
 disposal, 71
 disruptive innovation, 15, 74, 233
 dissatisfier, 10, 249
 diversity, 36, 41, 48–49, 53, 120, 190, 227
 divine intervention, 37
 division of labor, 218
 DIY product, 256
 DNA. *See* deoxyribonucleic acid
 dominant branch, 62
 dominant design, 2, 5, 12, 14, 18, 30, 32, 34, 41, 43, 45–46, 49, 61–62, 65, 73, 75, 80, 82, 83, 87, 104, 107, 110, 114, 119, 124–125, 132, 147, 153, 160, 181–182, 184, 191–192, 198, 218, 221, 230, 245, 265
 dominant producer, 223
 Dorel, 189
 Dosi, Giovanni, 239
 double-helix, 55
 Dow Jones Sustainability Index, 101
 Draissienne, 113, 122
 drawn ductile tungsten filament, 152
 Drivers Appeal for National Awareness (DANA), 184
 DSK. *See* Dvorak Simplified Keyboard
 DTMF. *See* dual-tone multi-frequency
 dual-tone multi-frequency (DTMF), 40
 DULED, 164
 Dunlop, John Boyd, 119, 124
 durable consumer product, 91
 Durant, Kevin, 207
 DVD, 62
 Dvorak Simplified Keyboard (DSK), 5, 237
 dwarfs standing on the shoulders of giants, 37
 Dynamic Adaptive Total Area Coverage. *See* DynaTAC
 DynaTAC, 103
 Dyn-O-Mite, 180
 early adopter(s), 7, 82, 157, 257, 258
 early majority, 7, 257, 258
 e-bike, 125
 economic benefits, 168
 economic change, 4
 economic development, 247
 economics, 4, 217
 economies of scale, 239
 ecosystem, 28, 34, 62, 119, 123, 168, 171, 178, 189, 194, 195, 202
 edge of competition, 80
 Edison screw base, 154
 Edison, Thomas Alva, 149
 efficacy, 9, 152, 155, 166, 168, 224
 efficacy development, 165, 167
 electric arc lamp, 227
 electric bicycle, 45
 electric lamp, 148
 electric lighting, 147
 electric lighting system, 227

- electric motor, 46
 electric network, 148
 electric network standard, 148
 electric shaver. *See* shaver
 electrification, 148
 electronic ballast, 164
 electronic component, 156, 164, 166
 electronic stability control (ESC), 174
 embeddedness, 75
 emerging firm, 239
 emigration, 247
 emotional benefit, 8, 33, 73, 82, 86, 89, 91, 198, 200, 248
 emotional meaning, 248
 emotional response, 236
 e-motor, 46
 enabling technology, 42, 45, 49, 63, 154, 164, 174, 226
 End-Of-Life (product-life-cycle) (EOL), 72
 End-Of-Life Vehicle, 63
 energy absorption system, 178
 energy crisis, 135
 energy efficient society, 149, 247
 energy infrastructure, 82
 energy label, 85
 energy saving, 85, 248
 energy use, 86, 169
 energy-efficient lighting technology, 168
 energy-efficient technology, 155
 engineering design, 250
 Engineering Product Life Cycle (E-PLC), 71
 enhancement sacrificial purchase syndrome, 262
 entrepreneur, 244
 entry barrier, 17, 239
 environmental friendly, 86, 250
 environmental problem, 81, 247
 EOL. *See* End-Of-Life
 EPD. *See* Evolutionary Product Development
 E-PLC. *See* Engineering Product Life Cycle
 equilibrium, 4, 14, 75
 era of ferment, 13, 14, 74, 148, 221
 era of incremental change, 13, 74, 221
 ergonomics, 78
 Ericsson, 102, 104
 ESC. *See* Electronic Stability Control
 esteem, 251
 ethics, 78, 84
 ethnography, 91
 EU regulation, 187
 Eukaryota, 55
 Euro NCAP. *See* European New Car Assessment Programme
 European New Car Assessment Programme (Euro NCAP), 174, 186
 evolution, 31
 evolution of products, 4, 21, 25–28, 49, 61, 62, 63, 68, 74, 263, 268, 269
 evolution of technology, 36, 51, 63, 226, 263
 evolutionary economics, 4, 226, 245, 263
 evolutionary metaphor, 3, 48
 Evolutionary Product Development, 23, 26, 59, 65, 69, 74, 75, 197, 203, 216, 217, 233, 263, 271
 evolutionary synthesis, 54
 exaptation, 23
 exclusion effect, 239
 experience economy, 9, 255
 experiment, 91
 explaneme, 20
 extinct, 54, 69, 190
 extraordinary innovative effort, 17, 239
 Facile, 114
 failed innovation, 245
 family tree diagram, 56
 FamilyFix, 185
 Faraday, Michael, 157
 fashion, 81, 109, 125, 241
 fashion brand, 81
 FAST. *See* Function Analysis System Technique
 fast-moving consumer goods (FMCG), 261
 FCC. *See* Federal Communications Committee
 FCV. *See* fuel cell vehicle
 feature(s), 10, 23–24, 33, 45, 64, 80–82, 86–89, 97–98, 106, 111, 174, 194, 198, 210, 212, 215, 216, 223, 237, 248–249, 261, 265
 Federal Communications Committee (FCC), 102
 ferment phase, 46
 fermentation, 13, 221
 filament type, 149, 153

Index

297

- filament, carbon, 151
- filament, coiled coil, 154
- finches, 54
- FireWire, 7
- first-generation cellular telephone network, 103
- first-generation CFL, 164, 224
- first-order subsystem, 14, 39
- fitness, 4, 6, 120, 122–123, 187
- flip phone, 105, *See*
- fluorescent lamp, 9, 154
- fluorescent tube lamp (TL), 155
- FMCG. *See* fast-moving consumer goods
- Foot, David, 240
- Ford Model T, 172, 190, 195
- Ford Motor Company, 175
- Ford, Henry, 172
- forecast, 221
- Forty, Adrian, 243
- fossil fuels, 82, 160, 248
- fossils, geographical distribution of, 54
- four-wheeler, 116, 122
- fuel cell vehicle (FCV), 68
- function, 31
- Function Analysis System Technique (FAST), 33
- functionality, 33, 77, 249
- future product, 66, 77, 90, 264

- Galapagos archipelago, 54
- gas lamp, 148
- gas lighting infrastructure, 151
- gasoline, 81
- gasoline stations, 81
- GE, 154, 164
- Geared Facile, 115
- Geels, Frank W., 17, 169, 244
- Geissler, Heinrich, 154
- Gemini space program, 174
- gene, 19, 58, 61, 225
- general lighting service, 153
- general lighting solution (GLS), 147
- general service lamp, 153
- genes of technology, 226
- genetic engineering, 21
- genetic information, 225
- genetic manipulation, 21
- genetics, 19

- genus, 53
- geographical distribution of wildlife and fossils, 54
- glass tubing, 154
- global system of mobile communication (GSM), 104
- global warming, 247
- GLS. *See* general lighting solution
- GLS incandescent lamp, 160
- GLS product class, 158, 167
- going viral. *See* viral
- good, 255
- Goodyear, 205
- government, 160
- graphical narrative, 34, 53, 64, 65
- green building, 135
- greenhouse gas, 160
- growth, 69
- GSM. *See* global system of mobile communication

- Haitz's law, 167
- halogen incandescent lamp, 31, 154, 168
- handset, 40
- Hans Torgersen and Sønn AS (HTS), 189
- headset, 109
- heat sink, 159
- Hekkert, Paul P.M., 248
- heterogeneous oligopolist, 78
- heterogeneous polypoly, 83
- HEV. *See* hybrid electric vehicle
- Hewitt, Cooper, 154
- hierarchical structures, 74
- High Bi, 113
- hip-hop culture, 207
- holiday, 91, 137
- home computer, 66
- Homo sapiens*, 35
- homogeneous polypoly, 83
- horizontal transfer of information, 57
- Horowitz, Alexandre, 94
- horseless carriage syndrome, 171
- housing, 128
- Housing Act, 130
- housing, public, 129
- housing, working-class, 91, 128
- HTS. *See* Hans Torgersen and Sønn AS
- HUE, 158
- human factors, 249

- human health, 85
 human need, 250
 human operator, 39
 Hutchinson, Dana, 183
 hybrid electric vehicle (HEV), 68
 hybridization, 245
- IBM, 223
 IC. *See* integrated circuit
 ICRT. *See* International Consumer
 Research and Testing
 ideation stage, 64
 IEA. *See* International Energy Agency
 IEEE1394 standard, 7
 immigration, 246
 import tax, 205
 Improved Mobile Telephone Service
 (IMTS), 103
 IMTS. *See* Improved Mobile Telephone
 Service
 incandescent bulb, 151
 incandescent lamp, 9, 30, 148, 154, 160,
 224, 227
 inclusion, 230
 incongruity, 10
 incremental change, 13, 221
 incremental development, 2
 individualization phase, 23, 76, 77, 83, 100,
 106, 127, 134–135, 143, 207
 Indo-European languages, 56
 industrial base, 159
 industrial design engineering, 33, 48
 industrial designer, 72, 92, 95
 Industrial Revolution, 1, 128
 industry and market change, 10, 11
 industry standard, 221
 Infanseat 440, 180
 Information Age, 1
 infrastructure, 103, 136
 infrastructure, energy, 82
 infrastructure, gas lighting, 151
 infrastructure, lighting, 148, 155
 inheritance of acquired characteristics, 53
 Inner-Directed, 252
 innovation, 3, 10, 12, 16,
 31, 36, 218
 innovation adoption rate, 52
 innovation policy, 217
 innovation studies, 3, 48, 217
- innovative art, 65
 innovator, 7, 43, 74, 78, 82, 157,
 230, 257, 258
 Innovator's Dilemma, 232
 installed base, 148
 institutional buyer, 168
 Integrated (Combined Outer- and Inner-
 Directed), 252,
 integrated circuit (IC), 166
 intelligent design, 21, 27, 37, 44
 interface, 6, 147
 interface standard, 152
 internal combustion engine, 171
 International Consumer Research and
 Testing (ICRT), 188
 International Energy Agency (IEA), 167
 International Organization for
 Standardization (ISO), 186
 Internet, 256
 introduction, 69
 invention, 2, 36, 39, 44, 57, 61, 65, 93, 124,
 148, 152, 168, 174, 179, 182, 205, 220,
 inventive-leap, 36
 inventor, 3, 22, 39, 43, 45, 149, 173, 190, 220,
 225, 230
 iPhone, 108, 110
 I-size, 187, 196
 ISO. *See* International Organization for
 Standardization
 Isofix, 184, 192
 isolation, 63
 item, 28, 33, 44, 234
 itemetics, 27
 itemization phase, 23, 77, 105, 124, 132, 137,
 192, 205
 iTunes, 111
- James, LeBron, 207
 Joint Photographic Experts Group (JPEG),
 6
 Jordan, Michael, 206
 Jordan, Patrick W., 249
 JPEG. *See* Joint Photographic Experts
 Group
- Keiper Recaro Group, 189
 keyboard layout standard, 236
 know-how, 4, 30, 36, 37, 43–45, 49, 61, 76,
 119, 189, 199, 219, 222, 224, 269

Index

299

- knowledge, 10
 knowledge accumulation, 25, 36, 43,
 55, 168
 knowledge fundament, 55
 know-what, 4, 30, 36–37, 43–45, 49, 61, 62, 76,
 119, 178, 189, 219, 224, 269
 Kyoto Protocol, 160
- labor conditions, 208
 labor productivity, 218
 Lady Phone, 108
 lady's curve, 124
 laggard, 7, 257, 259
 Lamarck, 53
 lamp, carbon arc, 151
 lamp, CFL-Halogen, 164
 lamp, CFL-LED, 164
 lamp, electric, 148
 lamp, electric arc, 227
 lamp, fluorescent tube, 155
 lamp, gas, 148, 227
 lamp, GLS incandescent, 160
 lamp, halogen incandescent, 31,
 154, 168
 lamp, mercury vapor, 154
 lamp, oil, 148
 landscape, 18, 246
 landscape development, 246
 language, 6, 56
 language tree, 56
 LATCH. *See* Lower Anchors and Tethers
 for Children
 late majority, 7, 257, 259
 lateral genetic exchange, 22
 lateral memetic exchange, 22
 launch, 250
 law, protectionist, 205
 Lawson's Bicyclette, 114
 Lazy User Model (LUM), 8
 LCC. *See* Life Cycle Costing
 lead user, 43–44
 learning cycle, 62
 LED. *See* light emitting diode
 LED bulb, 158
 LED lamp, 158
 legislation, 10, 27, 44, 62–65, 86–87, 131, 147,
 179, 194
 legislation (housing), 129
 legislation (import tax), 205
 legislation (in car child safety), 174, 178–180,
 182, 184–185, 187–188, 190
 legislation (incandescent light bulb phase
 out), 167, 170
 legislation, Dutch, 184
 legislation, ECE, 182, 188
 legislative body, 194
 legislator, 188, 196
 leisure class, 259
 leisure-enhancing product, 71
 LG Electronics, 107
 Life Cycle Assessment, 71
 Life Cycle Costing (LCC), 71
 lifespan, 151, 156
 lifestyle product, 125, 260
 lifetime, 156
 light-emitting diode (LED), 157
 light relay, 157
 lighting infrastructure, 155
 like minds, 22, 54, 169
 Linden, Sjeff van der, 180
 lineage, 51, 56
 lineage in human culture, 58
 lineage of products, 61
 lineage relationship, x, 58, 60–61
 linguistics, 56
 Linnaean classification, 55, 60
 Linnaean taxonomy, 60
 Linnaeus, 53
 lipstick, 98
 liquefied petroleum gas (LPG), 81
 lock-in, 5, 32, 75, 148, 230, 238
 locus of innovation, 12, 52, 219
 Loewy, Raymond, 23, 95, 234
 logo, 212
 long waves, 1,
 Losev, Oleg Vladimirovich, 157
 love and belonging, 251
 Lower Anchors and Tethers for Children
 (LATCH), 187, 192
 low-wage country, 87, 166, 198, 208
 LPG. *See* liquefied petroleum gas
 LUM. *See* Lazy User Model
- macro level, 18
 management studies, 217
 manufacturer, 188
 market development, 69
 market equilibrium, 75

- market growth, 245
- market leadership, 232
- market research, 64–65, 256
- market segment, 192, 244, 253
- marketing, 217, 250
- marketing manager, 91–92
- Marketing Product Life Cycle (M-PLC), 69, 76
- Maslow, Abraham, 250
- mass customization, 83–84, 89, 207, 256
- mass immigration, 246
- mass production, 172
- Matsushita
- maturity, 69
- Maxi-Cosi, 181
- MAYA. *See* Most Advanced Yet Acceptable
- McEnroe, John, 206
- McFarlan Moore, Daniel, 154
- meaning, 248
- meme, 19, 20–21, 56, 58
- meme pool, 20
- memeplexe, 20
- memetics, 19, 58
- “Mentality” model, 252
- mercury vapor, 154
- mercury vapor lamp, 154
- meso level, 18
- microelectronic, 42
- micro level, 18
- microprocessor, 42
- Middle-Of-Life (MOL), 72
- Midland Counties Railway Company, 137
- midlife crisis, 242
- midsole, 203
- miniaturization, 104, 161, 164
- minivan, 241
- Mitchell, Arnold, 252
- MLP. *See* multi-level perspective
- mobile phone, 10, 25, 44, 91, 100, 102–104, 107–109, 110–111, 269, 272, 274, 275
- Mobile Telephone Service (MTA), 102
- Mobile Telephone System (MTS), 102
- modern mainstream, 253
- MOL. *See* Middle-Of-Life
- monopolist, 78
- moped, 124
- Most Advanced Yet Acceptable (MAYA), 7, 23, 234
- mother product, 125
- Motorola, 103, 109
- Moulton bike, 125
- mountain bike, 125,
- mouthpiece, 39
- MP3 player, 107
- M-PLC. *See* Marketing Product Life Cycle
- MTA. *See* Mobile Telephone Service
- MTS. *See* Mobile Telephone System
- multilevel perspective, 17, 244
- mutation, 19, 27, 53, 225
- NASA, 205
- Nastase, Ilie, 206
- natural resource, 155, 169
- need (locus of innovation), 219
- need-driven, 252
- Nela Park laboratories, 154
- neoclassical economic theory, 4, 245
- neoclassical equilibrium model, 75
- neon tube light, 154
- nested hierarchy of subsystems, 13
- nested product, 171
- network effect
- new product development (NPD), 31, 60, 64
- new type of product, 26, 30, 44, 61, 111, 161, 164, 168, 171, 247
- New York World Fair exhibition, 155
- newness, 77
- N-Gage, 109
- niche, 18, 31, 43, 53, 65, 125, 142, 163, 171, 194, 211, 246
- niche accumulation, 245
- Nike Air, 205
- Nike iD, 207
- Nike Sport Research Lab, 207
- Niki, 176
- Nippon Telegraph and Telephone (NTT), 103
- NMT. *See* Nordic Mobile Telephone group
- new conservatives, 254
- Nokia, 104
- non-directional lamp, 163
- nontoxic material, 86
- non-uniform rates of change, 57
- non-user(s), 116, 118

Index

301

- Nordic Mobile Telephone group (NMT), 103
 Norelco, 95
 normal progress, 17, 239
 novelty, 227
 NPD. *See* new product development
 NTT. *See* Nippon Telegraph and Telephone
 number of product parts, 80
 numeric aesthetics, 74, 217
- OAD, 139
 OAPEC. *See* Organisation of Arab Petroleum Exporting Countries
 objective concinnity, 234
 objective information, 234
 obsolete, 62
 oil crisis, 155, 161, 247
 oil lamp, 148
 Olds Motor Vehicle Company, 171
 OLED, 168
 oligopolistic competition, 239
 oligopolistic maturity, 239
 Olympics, 207
 operating system (OS), 109, 111
 operations management, 250
 optics, 159
 optimization phase, 23, 77, 95, 104, 124, 131, 137, 192, 194, 205
 ordinary, 113
 organization, 248
 Organisation of Arab Petroleum Exporting Countries (OAPEC), 155
 organizational studies, 217
 origin of agriculture, 56
 origin of species, 54
 OS. *See* operating system
 OSRAM, 164
 Outer-Directed, 252
 outside the technological frame, 74
 outsole, 203
- palm, 109
 paradigm, 16
 paradigm shift, 56
 patent, 5, 24, 39, 44–45, 65, 93, 102, 125, 149, 157, 174, 195, 220, 222, 237
 path dependence, 4, 32, 75, 148, 230, 236
 patterns and mechanisms of innovation, 3
 patterns in historical development, 61
 PDA. *See* personal digital assistant
 PED. *See* Product Evolution Diagram
 Penny-Farthing, 114, 118
 performance phase, 23, 77, 94, 103, 113, 129, 136, 203
 persona, 65
 personal computer, 66
 personal digital assistant (PDA), 44, 109
 PEST, 66, *See* political, economic, social and technical
 PFT. *See* Product Family Tree
 phase out, 160
 Philips, 94, 154, 161
 Philips SL18, 162
 Philishave, 94
 Phoebus cartel, 153
 phone, budget, 109
 phosphorous coating, 154
 phylogenetic tree, 55, 58, 61
 physiological need, 250
 physiological property, 248
 Pine, Joseph and Gilmore, James H., 255
 pioneering, 69
 pioneering predecessor, 61, 149, 154
 piston engine, 222
 Pitt-Rivers, August, 51
 Plain Ordinary Telephone Service (POTS), 40
 pleasurable product, 249
 pleasure, 249
 PLM. *See* Product Lifecycle Management
 policy, 160
 political, economic, social and technical (PEST), 28, 63, 119, 205
 portable telephone
 POTS. *See* Plain Ordinary Telephone Service
 power struggle, 9, 155
 post-materialists, 254
 postmodern hedonists, 254
 Prahalad, Coimbatore Krishnarao, 256
 pressure group, 85
 previously developed product, 61
 price development, 127, 165
 price-performance ratio, 167, 169, 196, 245
 price-quality ratio, 109
 pricing, 78

- primitive version, 61
- prior art, 37, 44, 65
- Prus, 68
- process discontinuity, 222
- process innovation, 12
- process need, 10
- producer, 41, 43, 69, 80, 94, 116, 188, 217, 267
- product (definition), 30
- product (phase) characteristic, 33
- product architecture, 34, 65, 176, 189, 192, 225, 270
- product-centric perspective, xv, 48, 49, 263
- product class, 31, 46, 66, 147, 156, 158, 160
- product design, 250
- product development, 31, 71, 78, 217
- product discontinuity, 222
- product evolution, 64
- Product Evolution Diagram (PED), 34, 48, 53, 59–61, 64–65, 150, 162, 171, 191, 196–197, 264, 267, 269
- product family, 33–34, 60–62, 66, 125, 158, 162, 164, 190, 192, 194–195, 202, 216
- Product Family Tree, 34, 60, 196
- product innovation, 11, 264
- Product Life Cycle, 11, 92, 218
- Product Lifecycle Management (PLM), 72
- product manager, 91
- product phase, 23, 30, 33, 77–78, 82, 90–91, 101, 106, 111, 129–130, 135, 146, 153, 192, 193, 198, 209–210, 217, 263–264, 265–266, 269
- product phase characteristic, 77, 90, 92, 146, 198, 209, 264
- product phases, 81, 218
- product phases theory, 264
- product safety, 85
- product variant, 27, 34, 60, 169, 269
- product, durable consumer product, 91
- product-class
- production, 71, 78
- production capacity, 166
- production line, 161
- production mechanization, 159
- production process, 218
- production process characteristic (how), 11
- production ramp-up, 250
- production volume, 161
- profit margin, 233
- programming language, 57
- Prokaryotes, 21
- protolanguage, 56
- Public Health Act, 129
- Public Housing Act, 130
- pulse network technology, 39
- Puma, 205
- Questor Corporation, 180
- QWERTY, 5, 45, 223, 236
- QWERTZ, 6
- radical innovation, 18, 23, 26, 74
- Ramaswamy, Venkatram, 256
- raw material, 71
- Razr, 109
- recipeme, 20
- recombining knowledge, 225
- recyclability, 86
- recycling, 71
- regulations, 85
- reliability, 77
- Remington, 94, 98, 237
- replacement industry, 158
- replacement product, 158
- Research in Motion (RIM), 109
- residential market, 161
- retention, 13, 119, 169, 221
- retrofit, 155, 158, 161, 169
- retrospective case study, 81, 91, 147, 171
- retrospective case survey, 91, 128
- reuse, 71
- RIM. *See* Research in Motion
- ringtone, 105
- road map, 61
- robustness, 157
- Rogers, Everett, 257
- root period, 169
- roots, 61, 148–149, 169, 268
- rotary dial, 39
- routine, 4, 225
- Rover Safety Bicycle, 45, 114–115, 125
- rubber tire, 113
- safety, 77
- safety belt, 70, 173–174, 184
- safety need, 250

Index

303

- safety razor, 93
 safety, in-car, 171
 safety, passive, 174
 Samsung, 107
 Sanyo, 109
 satisfier, 10, 249
 saturated market, 216
 saturation, 69
 scale increase, 132
 Schick, Jacob, 93
 scientific paradigm, 16, 239
 SCOT. *See* Social Construction of Technology
 screw base socket, 147, 152, 155, 158, 161
 second-generation CFL, 164, 224
 second-generation network, 104
 second-order subsystem, 39
 segment, 33, 62, 65, 125, 154, 171, 192, 207, 253, 268
 segmentation, 82, 194
 segmentation phase, 23, 26, 34, 60, 62, 77, 99, 106–107, 125, 133, 142–143, 154, 166, 182, 192, 194, 207, 268
 selecteme, 20
 selection, 13, 119, 169, 221, 227
 selective breeding, 21
 self-actualization, 251
 semantic interpretation, 234
 semiconductor industry, 157
 semiconductor manufacturer, 159
 senior, 242
 service, 78, 255
 service product, 9, 255, 260–261
 service sector, 161
 sewing machine, 116
 sexual reproduction, 21
 shaver, 91, 94, 230
 shaver, dry, 93
 shaver, vibration, 94
 shoe, basketball, 203
 shoe, running, 205
 shoe, signature, 203, 207
 side wing, 185
 side-impact protection, 196
 simplicity, 78
 SIT. *See* Systematic Inventive Thinking
 skyhook, 37, 45
 slowdown, 71
 smartphone, 16, 36–37, 43–44, 108–110, 113, 158, 256, 260, 269
 Social Construction of Technology (SCOT), 9, 114
 social group, 9, 116, 119, 230
 social network, 8, 107, 259
 societal change, 248
 sociology, 7, 217
 socio-technical regime, 18, 246
 socio-technical relevance, 152
 software application, 158, 168
 solid-state lighting (SSL)
 solution space, 66–67, 87, 266
 sources of innovation, 10
 space wagon, 241
 speaker, 39
 special edition, 80, 82, 86, 88
 specialization, 218
 specialization of labor, 35
 specialty product, 260
 speciation, 63, 125
 species, 18, 29, 31, 51, 53, 60, 225, 268
 sports professional, 206
 SSL. *See* Solid State Lighting
 stakeholder, 116, 230
 standard, 6, 31, 40, 47, 62, 86, 131, 147, 152, 174, 178, 186, 188, 236
 standardization, 6, 63, 132, 179, 188, 194, 218, 238
 standardizing, 218
 Star, 114
 starter family, 241
 starters, 240
 status symbol, 78, 107
 steamship, 245, 247
 Steel Beard, 95
 stemmatics, 56
 Stone Age, 35
 stone stools, 61
 Storchenmühle, 176, 189
 street lighting, 148
 Structural Substance-Field Analysis (SuField analysis), 220
 student, 64, 73, 197, 203, 244, 252, 264–265, 269, 271
 student work, 197, 203, 271
 styling, 33, 78

- subjective concinnity, 234
- subjective information, 234
- substitute, 31, 70, 161
- substitute product, 70
- subsystem, 13, 16, 32, 39, 43, 45, 49, 59, 124, 152, 159, 162, 164, 189, 270
- subsystem evolution, 45
- suburbanization, 128
- SuField analysis. *See* Structural Substance-Field Analysis
- supermarket, 260
- supply-and-demand, 4
- supply-chain design, 250
- support, 71
- survey, 91
- survival of the fittest, 19, 20, 118, 225
- sustainability policy, 208
- sustainable design, 23
- sustaining innovation, 15, 74, 233
- SUV, 189, 241
- Swan, Joseph Wilson, 149
- switchboard, 39
- symbolic association, 234
- system, 10, 13, 24, 30, 38–40, 42–43, 48–49, 53, 55, 57, 59, 62–63, 94, 96–98, 102–103, 113, 135, 151, 170, 174, 178, 182–183, 186–187, 220, 257, 259, 269, 271–275
- system diagram, 152, 162, 190
- system evolution, 38
- Systematic Inventive Thinking (SIT), 220

- tablet, 158
- take-off, 70
- TAM. *See* Technology Acceptance Model
- target group, xvii, 76, 80, 85, 98, 116, 123, 139, 267
- taxonomic rank, 53
- taxonomy, 53, 60
- TCO. *See* total cost of ownership
- technical discontinuity, 13–14
- technological change, 12
- technological discontinuity, 13, 74, 221, 223
- technological evolution, 227
- technological frame, 74, 230
- technological leadership, 240
- technological paradigm, 16, 239

- technological revolution, 1
- technological trajectory, 24, 239,
- technological transition (TT), 17, 24, 147, 157, 169, 244
- technology (locus of innovation), 219
- Technology Acceptance Model (TAM), 8
- technology add-on, 245
- technology-centric perspective, 9, 264
- technology cycle, 14, 24, 30, 152, 164, 166–167, 169
- technology family, 147, 149
- technology life cycle, 11
- technology push, 78–79, 87–88, 130
- telephone, 30, 38–44, 57, 97, 102, 106, 109, 269, 272
- telephone network, 30, 38,
- Tesla, 68
- testing protocol, 168
- text messaging, 104
- Theory of Product Evolution, 59
- theory of reasoned action (TRA), 8
- third-generation CFL, 166
- third-generation mobile network, 108
- three-wheeler, 116
- Thunderbolt, 7
- timeline, 64
- time-saving product, 71
- TL. *See* fluorescent tube lamp
- TNO, 181
- Tot Guard, 175
- total cost of ownership (TCO), 155, 168
- touch screen, 11, 16, 108, 110
- tour operator, 138
- tourism, 136
- Toyota, 68
- TRA. *See* theory of reasoned action
- Tracer, 100
- transistor, 42
- transition management, 248
- transmutation of species, 53
- travel agency, 137
- travel guidebook, 137
- traveling, 91, 136
- tree diagram, 56, 57
- tree of life, 55, 58
- trial-and-error, 13, 66, 76, 115, 237, 239
- tricycle, 114

Index

305

- TRIZ, 24, 64, 220, 221
 truck, 189
 TT. *See* technological transition
 tube geometries, 161
 tube style, 161
 tubular fluorescent lamp, 160
 Twitter, 22
 two-wheeler, 115
 type-A, 153
 typewriter, 5, 25, 223, 237
- US Air Force, 223
 U-form, 229
 UI. *See* user interface
 unexpected occurrence, 10
 Unified Structured Inventive Thinking (USIT), 220
 Unified Theory of Acceptance and Use of Technology (UTAUT), 8
 Universal Darwinism, 18, 123
 Universal Serial Bus (USB), 7
 University of Twente, 65, 197, 203
 upper, 203
 upper-class, 259
 social climbers, 254
 usability, 249
 usage, 71
 USB, 63, *See* Universal Serial Bus
 USB Type-C, 7
 user (opposite of nonuser), 117
 user interface (UI), 78, 111
 USIT. *See* Unified Structured Inventive Thinking
 UTAUT. *See* Unified Theory of Acceptance and Use of Technology
 utilities, 151, 156, 166, 169
 UV light, 154
 UV radiation, 154
- VALS. *See* Value and Lifestyle typology
 Value and Lifestyle typology (VALS), 252
 value chain, 159
 value engineering, 64
 variation, 13, 119, 169, 221
 Veblen, Thorstein, 259
 velocipede, 117
 Vertu, 109
 VHS, 6, 62, 223
 video call, 108
 video recording, 62
 videocassette recorder, 223
 videotape format, 6, 62
 viral, 20
 visible light, 154
 voice over Internet protocol (VOIP), 42
 VOIP. *See* voice over Internet protocol
 Volta, Alessandro, 148
 Volvo, 174
- Wallace, Russel, 54
 wallpaper, 107, 109
 Wankel engine, 222
 wants and needs, 244, 260
 WAP. *See* wireless application protocol
 Watson, James D. and Crick, Francis, 55
 WiFi, 63
 wildlife, geographical distribution of, 54
 wireless application protocol (WAP), 107
 Woodring, Cooper, 259
 working-class housing, 91, 128
 world of born, 268
 world of life, 51, 60
 world of made, 22, 51, 56, 60, 263
- Xtraordinary, 114
 young senior, 242