

# Index

- Abernathy, W., 177  
Achilladelis, B., 108  
Agency costs, 6, 46–50  
Aghion, P., 48  
Allen, R., 10, 78, 83, 86  
Allen, T., 63  
Amabile, T., 61  
Antelman, K., 89  
Antorini, Y., 174  
Apache web server software, 5, 6, 19, 23, 38–42, 82, 83, 101, 102  
Arora, A., 70, 84  
Arrow, K., 89  
Arundel, A., 84  
Awad, N., 167
- Balachandra, R., 108  
Baldwin, C., 56–60, 94  
Bakke, G., 144  
Barclay, I., 108  
Barnes, B., 50  
Baron, J., 63  
Behlendorf, B., 126  
Benkler, Y., 12, 115  
Berners-Lee, T., 145  
Bessen, J., 48, 114  
Bijker, W., 17, 135, 172, 173  
Boldrin, M., 115  
Brand communities, 174  
Bresnahan, T., 118, 119, 182  
Brooks, F., 94
- Brown, J., 174  
Buenstorf, G., 73
- Campbell, D., 137  
Carson, R., 40  
Chamberlin, E., 110  
Christensen, C., 144  
Churchill, J., 135  
Clark, K., 59, 94  
Coase, R., 57, 58  
Cohen, W., 68, 84  
Connell, J., 150  
Conner, K., 99  
Consumers, 19  
Contracting, 48  
Conway, C., 152  
Cook, T., 137  
Copyrights. *See* Intellectual property rights  
Csikszentmihalyi, M., 61  
Custom products  
agency costs and, 6  
Apache web server software and, 38–41  
heterogeneity of user needs and, 5, 6, 33–43, 74, 93, 126, 162  
innovation and, 127, 128  
manufacturers and, 6, 14, 15, 51, 52, 117, 18, 127, 128, 145–164  
market segmentation and, 37  
product platforms and, 14, 15, 128–130, 172

- Custom products (cont.)  
 suppliers and, 127, 128  
 toolkits and, 14, 15, 147–164  
 users and, 6, 7, 14, 15, 33–45, 121, 127, 128, 145, 172
- Dam, K., 89
- Danneels, E., 145
- Dasgupta, P., 168
- David, P., 168
- de Fraja, G., 87
- Dellarocas, C., 167
- Digital Millennium Copyright Act, 12, 117, 118
- Duguid, P., 174
- Duke, R., 56
- Economic benefit, expectations of  
 by lead users, 4, 5, 22, 23, 31  
 by manufacturers, 2–4, 6–10, 51, 52, 56, 128  
 by users, 1–11, 51, 52, 56, 128
- Ehrenkrantz Group, 56
- Eisenberg, R., 113, 114
- Elrod, T., 108
- Enos, J., 22
- Ettrich, M., 116
- Fetchmail, 102, 103
- Finkelstein, S., 10, 79, 136
- Fleming, L., 94
- Foray, D., 17, 76, 113, 168, 169
- Fosfuri, A., 84
- Franke, N., 4–6, 10, 11, 20, 23, 27–30, 37–42, 66, 79, 80, 103, 105, 135, 161, 162, 180
- Freeman, C., 22, 108
- Free revealing of innovation information, 78  
 case for, 9, 10, 80, 81  
 collective action model for, 11, 13, 89–91  
 collective invention and, 78, 79, 83  
 copyright protection and, 85, 89  
 evidence of, 9, 10, 77–80, 83  
 government policy and, 119  
 in information communities, 9, 10, 13, 106, 166, 168  
 innovation and, 124–126, 129  
 incentives for, 85–88  
 and information diffusion, 81–83  
 intellectual property rights and, 9, 10, 13, 110–113, 129  
 lead users and, 109–121  
 and library information search system, 79  
 manufacturers and, 9, 11, 80  
 and open source software, 9–11, 80, 86, 87, 90  
 and patent protection, 83–86, 89  
 private-collective model for, 11, 90, 91, 106  
 reuse and, 88, 89  
 and sports equipment, 79, 80  
 social welfare and, 110, 111, 119  
 trade secrecy and, 89  
 users and, 9, 10, 13, 17, 77–91, 109, 124
- Free software, 8, 11, 93, 96–99. *See also*  
 Open source software
- Friar, J., 108
- Friedman, D., 90
- Gallini, N., 113
- Gambardella, A., 70, 84
- Gemunden, H., 127, 176
- General Electric, 130
- Goto, A., 84
- Government policy, 2, 107–119. *See also*  
 Digital Millennium Copyright Act  
 copyrights and, 12, 114, 115  
 distribution channels and, 118  
 free revealing and, 110–113, 129  
 intellectual commons and, 113–117  
 intellectual property rights and, 111–117, 129, 131  
 licensing and, 12

- manufacturer innovation and, 2, 107, 108, 117–119  
 and national competitive advantage, 170–172  
 patents and, 12, 111–114  
 patent thickets and, 12, 114  
 provisioning biases and, 110, 111  
 R&D subsidies and, 118, 119  
 and social welfare, 2, 11–13, 107–113, 117–119  
 trade secrets and, 10, 111, 117, 129  
 user innovation and, 2, 11–13, 107–111, 114–119  
 Green, P., 37  
 Greenstein, S., 118, 119, 182  
 Griffith, S., 103, 104, 125  
 Grimm, C., 99  
 Gum, E., 159–161
- Hackers, 8, 98, 99, 181  
 Hall, B., 84, 114  
 Hanson, C., 116, 124  
 Harhoff, D., 77, 80, 81, 84, 87, 88  
 Harsh, M., 130  
 Hecker, F., 126  
 Heller, M., 113, 114  
 Henkel, J., 10, 11, 77, 80, 81, 84, 87, 88, 94, 107, 110, 111, 129  
 Herrmann, S., 8, 60  
 Herstatt, C., 20, 35–37, 72–75, 127, 143, 144, 176  
 Hertel, G., 8, 60  
 Hienerth, C., 127, 176  
 Hirschleifer, J., 86  
 Hollander, S., 21  
 Honscheid, J., 1  
 Horgan, M., 1  
 Horwich, M., 173  
 Hunt, R., 114
- IBM, 79, 130  
 Information asymmetries, 8, 9, 48, 66–74, 109, 148–151  
 Information commons, 1, 13, 17, 77–81, 85–88, 95, 96, 165–168, 172–174. *See also* Information communities; Innovation communities  
 Information communities, 17, 165–168. *See also* Innovation communities  
 Innovation. *See also* Innovation communities  
 attractiveness of, 4, 5  
 distributed process of, 9, 10, 93–95, 145, 146  
 economic benefit of. *See* Economic benefit  
 functional sources of, 3, 8, 94, 95, 145, 146  
 and government policy, 107–119  
 lead users and. *See* Lead users  
 manufacturers and. *See* Manufacturers suppliers and. *See* Suppliers  
 users and. *See* Users  
 Innovation communities, 7, 10, 11, 14, 17, 93–106, 116, 126, 129, 131, 166. *See also* Information communities  
 Apache web server software and, 101  
 brand and, 174  
 fetchmail and, 101, 102  
 innovation and, 93–106  
 kitesurfing and, 14, 103, 104  
 open source software and, 11, 14, 96–102, 113, 124, 126, 129, 131, 172, 181  
 physical products and, 11, 14, 103–105  
 and social welfare, 7  
 sociology of, 172–174  
 and sources of innovation, 11, 17, 94, 95, 129, 131  
 and sporting equipment, 11, 27–30, 103, 104  
 user-to-user assistance and, 105, 106  
 Innovation process, 7, 8, 31, 45, 60, 61, 123, 124  
 Intellectual commons, 115–117

- Intellectual property rights. *See also*  
 Private-collective innovation  
 copyrights and, 10, 12, 81, 85, 89, 114, 115  
 free revealing and, 9, 10, 13, 77–91, 110–113, 129  
 information communities and, 13, 17, 168, 170  
 innovation and, 2, 3, 17, 170  
 intellectual commons and, 115–117  
 licensing of, 10, 12, 85, 98, 115, 116, 170  
 open source software and, 9, 10, 170  
 patent thickets and, 12, 114  
 patents and, 10, 12, 83–86, 89, 111–114  
 trade secrets and, 10, 81, 89, 111, 117, 129
- Jensen, M., 6, 46  
 Jeppesen, L., 105, 111, 129, 130, 148  
 Jervis, V., 108  
 Jokisch, M., 129
- Katz, R., 151  
 Kelly, C., 72  
 Kelman, A., 108  
 Kitesurfing, 14, 93, 103, 104, 124–126, 172  
 Kline, R., 173, 174  
 Knight, K., 21  
 Knowledge, production and distribution of, 17, 168–170  
 Kollack, P., 126  
 Kotabe, M., 72  
 Kristensen, P., 149
- Lakhani, K., 8, 60, 61, 82, 83, 87, 106, 166  
 Lead users, 4, 5, 15–31, 133–146  
 Apache web server software and, 20, 23, 38–41  
 characteristics of, 4, 5, 134  
 commercial attractiveness of, 4, 5, 24, 26, 28  
 economic benefit, expectations of, 4, 5, 22, 23, 31  
 idea generation and, 15, 16, 133, 136–146  
 identification of, 4, 5, 15, 16, 133–142  
 innovation and, 4, 5, 15, 16, 19–31, 121, 127, 133–146  
 library information search system and, 4, 20, 23–27, 34, 35, 79  
 manufacturers and, 27, 127, 133–136, 144–146  
 market research methodologies and, 133, 137, 138, 139, 142  
 mountain biking and, 20, 35–37  
 outdoor consumer products and, 20, 21  
 pipe hanger hardware and, 20, 143, 144  
 printed circuit CAD software and, 20, 23, 24, 142, 143, 172  
 pyramiding and, 135, 136  
 sporting equipment and, 19, 27–30, 127  
 StataCorp statistical software and, 136  
 surgical equipment and, 20, 30, 127  
 theory of, 22, 23  
 3M and, 15, 16, 133, 136–143  
 toolkits and, 163
- Lerner, J., 86  
 Lessig, L., 13, 115, 118  
 Lettl, C., 127, 176  
 Levin, R., 84  
 Levine, D., 115  
 Levinthal, D., 68  
 Levy, S., 97, 151  
 Library information search system, 10, 20, 23–27, 34, 35, 79  
 Licensing. *See* Intellectual property rights  
 Lilien, G., 16, 136–143  
 Linux, 116, 124, 131, 181  
 Lim, K., 10, 79

- Local information, 8, 9, 31, 66–76, 94
- Lopez, L., 99
- Lüthje, C., 20, 21, 30, 35–37, 72–75
- Machlup, F., 169
- Mansfield, E., 23, 67, 82–84, 107, 108, 118
- Manufacturers
- agency costs and, 46–50
  - characteristics of, 3
  - custom products and, 6, 14, 15, 33
  - innovation and, 13–15, 121–131, 147–164
  - dimensions-of-merit product improvements and, 146
  - expectations of economic benefit by, 2–9, 33, 51–52, 56
  - free revealing and, 9, 10, 80
  - government policy and, 2, 107, 108, 117–119
  - information asymmetries of, 8, 9, 70–72
  - innovation and, 1–3, 6–9, 14–17, 27, 33, 37, 45, 49–52, 56, 70–76, 107–119, 133, 136, 147–164, 174
  - lead users and, 4, 5, 27, 127, 133–136, 144–146
  - national competitive advantage and, 170–172
  - social welfare and, 7–13
  - transaction costs and, 55–57
  - innovate-or-buy decisions and, 6, 7
- Marketing research, 15, 16, 37, 133, 134, 167
- Marples, D., 63
- Martin, J., 150
- Marwell, G., 90
- Mathews, J., 25
- Maurer, S., 115
- McAdam, D., 90
- McCool, Rob, 101
- Mead, L., 152
- Means, R., 56
- Meckling, W., 6, 46
- Merges, Robert, 113, 114
- Merton, Robert, 168
- Meyer, M., 99
- Microsoft, 13, 128, 151
- Midgely, David, 23, 179
- Mishina, K., 79
- MIT Artificial Intelligence Laboratory, 97, 98
- Mitchell, R., 40
- Molin, M., 129
- Mollick, Ethan, 131
- Morrison, Pamela, 4, 10, 20, 23–27, 34, 35, 79, 136–143, 179
- Mountain biking, 20, 34–37, 72–75, 94
- Muniz, A., 174
- Nagata, A., 84
- Narver, J., 144
- National competitive advantage, 170–172. *See also* Government policy
- Nelson, R., 68, 84, 113, 114, 170
- Niedner, S., 8, 60
- Nuvolari, A., 10, 78, 79
- Ogawa, S., 8, 71, 72, 108
- O’Guinn, T., 174
- Oliver, P., 90
- Olson, E., 144
- Olson, M., 89, 90
- Open source software. *See also* Free software
- communities and, 172, 174
  - innovation and, 97–102, 126, 129–132
  - free revealing and, 9–11, 80, 86, 87
  - innovation communities and, 11, 93, 96–102, 111, 113, 124, 126, 129–132, 172, 181
  - intellectual commons and, 115–117
  - intellectual property rights and, 9, 10, 115–117
  - knowledge and, 169, 170
- Ostrom, E., 90
- Outdoor products, 20, 21

- Patents. *See* Intellectual property rights
- Pavitt, K., 22
- Penning, C., 73
- Perens, B., 98
- Pinch, T., 17, 172–174
- Pine, J., 163
- Pipe hanger hardware, 20, 142, 143
- Polanyi, M., 67, 68
- Poolton, J., 108
- Porter, M., 17, 170–172
- Pottinger, T., 173
- Prahalad, C., 99
- Printed circuit CAD software, 20, 23–34, 142, 143, 172
- Private-collective model, 11, 90, 91, 106
- Product development, 2, 165, 174–177
- Project SAPPHO, 108
- Prügl, R., 135, 161
- Punj, G., 37, 180
- Pyramiding. *See* Lead users
- Raymond, E., 9, 10, 86, 94, 98, 101, 102, 126, 181, 182
- Redmond, W., 108
- Reisinger, H., 5, 37
- Riggs, W., 70, 71, 95
- Roberts, J., 4, 10, 20, 23–27, 34, 35, 79, 179
- Robertson, A., 108
- Rosenberg, N., 21, 22, 68
- Rothwell, R., 108
- SAPPHO study, 108
- Sattler, H., 84
- Schaffer, C., 37
- Schau, H., 174
- Schmidt, G., 173
- Schmookler, J., 23
- Schrage, M., 151
- Schreier, M., 161, 162
- Scientific instruments, 70–72, 94, 95
- Scotchmer, S., 113
- Searls, K., 136–143
- Shafer, L., 150
- Shah, S., 1, 2, 10, 11, 22, 27–30, 79, 80, 85, 95, 103, 105, 127, 176
- Shapiro, C., 12, 114
- Silberston, Z., 84
- Singleton, S., 90
- Slater, S., 144
- Slaughter, S., 52–56, 59, 60, 83–85
- Smith, A., 21
- Smith, G., 99
- Social welfare  
   free revealing and, 89  
   and government policy, 2, 11–13, 107, 108  
   innovation and, 2, 3, 110–112, 121–131  
   manufacturer innovation and, 7–13  
   private-collective model and, 11, 90, 91, 106  
   user innovation and, 2, 3, 7–13
- Sonnack, M., 135–143
- Spaeth, S., 88, 100
- Spence, M., 110
- Sporting equipment  
   free revealing and, 79, 80  
   innovation communities and, 94, 95, 105, 106  
   lead users and, 19, 20, 22, 27–30, 176  
   user-to-user assistance and, 105, 106
- Stallman, R., 97–99
- Stanley, L., 1, 2
- Stewart, D., 37, 180
- Stressed-skin panels, 52–56, 59, 60
- StataCorp statistical software, 128–131, 136
- Sticky information, 8, 67, 68  
   dimensions-of-merit product improvements and, 146  
   innovation and, 8, 9, 16, 57, 66–70, 93, 108, 146  
   and scientific instruments, 70, 71  
   toolkits and, 20, 30, 109, 112, 148–151, 176
- Suppliers, 3, 127, 128

- Surgical equipment, 20, 30, 109, 112, 176
- Suzlanski, G., 67
- Task partitioning, 13–15, 150–153. *See also* Toolkits
- Taylor, C., 84
- Taylor, M., 90
- Technical communities, 165, 172–174
- Technicon Corporation, 79, 136
- Tedd, L., 25
- Teece, D., 67
- Thies, S., 129
- Thomke, S., 63, 66, 128, 135, 138, 148, 151
- 3M Corporation, 15, 16, 133, 136–143
- Tirole, J., 48, 86, 111
- Toolkits, 16, 128–130, 147–164
  - characteristics of, 147, 148, 153, 154
  - GE and, 130, 148
  - innovation and, 147–164
  - International Flavors and Fragrances and, 148
  - lead users and, 163
  - manufacturers and, 13–15, 148–164
  - module libraries for, 159
  - Nestle and, 159–161
  - open source software and, 100, 101
  - platform products and, 14, 15, 128–130, 172
  - semiconductor manufacture and design and, 16
  - sticky information and, 148–151
  - StataCorp and, 128–131
  - solution spaces and, 156, 157
  - task partitioning, 13–15, 152, 153
  - trial-and-error learning in, 148, 149, 154–156
  - user-friendly tools for, 13, 147, 157–161
  - users and, 13–15, 148–164
- Trade secrets. *See* Intellectual property rights
- Transaction costs, 45, 46, 50–60, 114. *See also* Agency costs
- Trevithick, R., 78, 79
- Trial-and-error problem solving, 63–66, 148, 149, 152–156, 161
- Tripsas, M., 127
- Tyre, M., 63, 68–70, 149, 150
- Ulin, D., 50
- Urban, G., 20, 23, 24, 142, 143
- User innovation. *See* Innovation; Innovation communities; Users
- User need, 5, 6, 13, 33–43, 74, 93, 121, 126, 162
- Users. *See also* Lead users
  - agency costs and, 6, 46–50
  - characteristics of, 3
  - co-invention and, 118, 119
  - custom products and, 14, 15, 33–43, 127, 128, 172
  - expectations of economic benefit by, 1–9
  - free revealing by, 9, 10, 13, 17, 77–91, 168
  - government policy and, 2, 107–119
  - innovation and, 13–15, 121, 131
  - information asymmetries of, 8, 9, 48, 66–74, 109
  - information communities and, 11, 168
  - innovate-or-buy decisions by, 5–8, 45–63, 72–75, 94, 123, 124, 176
  - innovation and, 1–9, 14–16, 33–45, 49–51, 63–76, 93, 107–119, 133–164, 174–177
  - innovation communities and, 105, 106, 131
  - innovation process and, 7, 8, 31, 45, 60, 61, 123, 124
  - knowledge and, 168–170
  - low-cost innovation niches of, 8, 9, 31, 63–76, 93, 94, 176
  - national competitive advantage and, 170–172
  - needs of, 5, 6, 33–43, 74

## Users (cont.)

and paying for innovations, 38–41, 45,  
121

process improvements by, 21, 22

social welfare and, 11–13, 107, 110, 111

toolkits and, 147–164

transaction costs and, 46, 50–56

Utterback, J., 177

Van der Plas, R., 72

Varian, H., 12, 117

von Hippel, E., 4–6, 10, 11, 20–27,

34–42, 63, 66, 67–84, 87, 90–91,

95–111, 121–123, 128, 135–144,

148–151, 166, 171, 175, 180

von Krogh, G., 11, 88–91, 100

Wagner, S., 107, 108, 118

Walsh, J., 84

Watt, J., 78

Weber, S., 17, 116, 169, 170

Wellman, B., 96

Wenger, E., 174

Wikipedia, 17, 166

Wind, Y, 37

Windsurfing, 1, 2, 127, 176

Winter, S., 67

Wolf, B., 8, 60, 61, 87

Young, G., 99

Zeroprestige.com, 103, 104, 125

Zhang, X., 167

Ziedonis, R., 114