

# Index

## A

Adaptive systems, 91  
Agent, 177, 202  
Agent-based analytic framework, 75  
Agile software development, 4, 8, 22  
Alternating Variable Method, 120, 121  
Amazons mechanical turk, 194, 198, 205  
Android, 187, 219, 221, 225, 226, 252, 253, 260–262  
APISENSE, 250  
APISENSE crowd-sensing library, 250  
APISENSE mobile application, 253  
Apple App Store, 3  
AppStori, 181  
Artifact-centric incentives, 94–96  
Artifact lifecycle model, 95, 100–102, 109  
Autonomous service, 86  
AutoService, 73, 75, 85–88  
AutoService platform, 73, 85, 87  
Awarding mechanism, 159, 160

## B

Bipartite graph, 157, 160  
Bitbucket, 53  
Bug finding, 165

## C

Case study, 260  
Cellphones, 244  
Cloud computing, 207, 214, 244, 263  
Co-innovation, 5, 10, 11, 22  
Collaboration mechanism, 131, 134, 186  
Collaborative filtering, 220, 221, 233, 239  
Collaborative Majority Vote, 133, 135

Collective intelligence, 5, 6, 47, 54, 61, 143, 156, 159, 213  
Competition, 187, 206  
Competitive Software Development, 10, 11, 22  
Computational coordination, 54  
Computational infrastructure, 206  
Computer science, 108, 130  
Computing resources, 244  
Contest theory, 20, 145, 150–152, 158  
Contributor  
    help contributor, 36, *see also* Peripheral contributors  
    regular contributor, 30, 34  
Coordination, 167  
Cost-effective creation, 40  
Crowd collaboration, 165, 172, 173, 181, 188  
Crowd-sensing, 244, 249–253, 255, 260, 261, 263  
Crowd testing, 222  
Crowd wisdom, 166–169, 178, 180, 186  
Crowd worker, 194  
Crowd workforce, 7, *see also* Global workforce  
    on-demand scalable workforce, 5  
Crowdsourced labour, 40, *see also* Crowd labour  
Crowdsourcing organization, 20, 85, 88

## D

Deployment, 171, 191, 247, 248, 251, 263  
Desire lines, 53, 68  
Development creativity and talents, 166  
Development lifecycle, 191, 192  
Development paradigm, 22, 168

Distributed software crowd sourcing, 9, 13, 144

## E

Empirical studies, 185  
 Engineering processes, 165  
 Evidence sharing, 172, 175  
 Evolutionary algorithm, 120

## F

Fitness function, 113, 116, 120, 123, 125, 128  
 Five-stage volunteering process, 29  
 Fundamental principle, 4, 10, 22, 144

## G

Game theoretical model, 143  
 Game theory, 19  
 Genetic algorithms, 113, 120, 121  
 GitHub, 166, 168, 185, 187  
 Global labor force, 9  
 Governance of software crowdsourcing, 149  
 Guiding principle, 26, 28, 37

## H

Human-based service, 105, 109  
 Human participation, 95  
 Hybrid development ecosystem, 165

## I

Incentive, 46, 54, 65, 92, 93, 95, 97, 99, 100, 102, 104, 109, 201, 207, 213, 214, 221, 239, 240  
 Incentive mechanism  
   artifact-interdependent incentive mechanisms, 98, 101  
   personal incentive mechanisms, 95, 102  
   state-dependent incentive mechanisms, 98  
   temporal incentive mechanisms, 98, 100  
 Incentive mechanism model, 94, 99  
 Incentive packages, 103  
 Integration environment, 11  
 Interaction and collaboration mechanisms, 134, 186  
 iTest, 221, 225, 239, 240  
 iTestClient  
   iTestServer, 226

## L

Labor market, 8, 9, 17, *see also* Online labor market  
   crowdsourcing labor market, 8, 9, 17  
 Large-scale software, 4, 5, 9, 17, 22, 122  
 Learning development practices, 67  
 Life cycle model, 168  
 Linear temporal logic, 100

## M

Majority vote, 44  
 Manual labor, 17  
 Manufacturing activities, 166  
 Micro-tasks, 132, 133, 141  
 Min-Max Quality Assurance, 149  
 Mobile crowdsourcing, 225, 240  
 Multi-agent system, 45, 75, 79, 88  
 Multi-cloud infrastructure, 245

## N

NASA, 7, 145  
 NASA Zero Robotics, 159  
 Nash equilibrium, 19  
 Non-negative CP decomposition, 230, 232  
 Non-negative tensor factorization, 219, 228

## O

Odesk, 40, 41, 53, 59  
 Offense-defense, 5, 15, 22  
 On-demand scalable workforce, 5, 22  
 Open collaboration, 28, 36  
 Open communication, 27, 28, 36, 37  
 Open source community, 144, 148  
 Open source community management, 26  
 Open source project, 10, 25–28, 37, 184, 185  
 Open source software development, 25, 29, 45  
 Open source volunteering, 26, 28, 30  
 Optimization problems, 20, 113, 114, 119  
 Outsourcing, 47, 180, 181

## P

Participation, 36, 95, 171, 187, 192, 195, 211, 221, 239  
 Peer-production, 4, 10, 11  
 Project budget, 124  
 Project hosting sites, 185  
 Project leader, 14, 26, 30, 36, 37  
 Protocols, 53, 58, 59, 63, 67, 194, 204, 220, 246  
 Prototype, 73, 86, 108, 172

**Q**

- QoS, 105
- QoS-aware Web service recommendation, 219, 226, 240
  - temporal QoS-aware web service recommendation framework, 220
- Quality and productivity, 114, 115, 122, 129
- Quality control, 132, 136, 139

**R**

- Ranking, reputation and reward system, 129
- Real-time collaborative extension, 136
- Recommendation, 105, 219–221, 226–228, 232, 240
- Reputation metric, 43, 44
- Reputation transfer, 44, 109
- Requirement elicitation, 166, 167, 184
- Resource sharing, 165, 168, 172, 173, 175, 176, 181, 182, 184, 185, 188, 214
- Runtime monitoring, 101, 165, 172, 173, 176, 177

**S**

- SaaS (Software-as-a-Service), 20, 245–247
- Scalable process, 40
- Search algorithms, 113, 120, 125, 126
- Search-based software engineering, 20, 114, 123
- Self-organization, 45, 85
- Self-organizing, 28
- Sensing experiments, 251, 263
- Service-oriented computing, 3
- Simulated users, 219
- Smartphone, 4, 250, 252–254, 262
- Social Cloud, 192, 207, 215
- Social Compute Cloud, 193, 202, 203, 214
- Social Compute Unit, 91
- Social Content Delivery Network, 193, 199
- Social machine, 53–57, 59, 66, 69
- Social marketplace, 194, 209
- Social network analysis, 201, 204, 215
- Social networking, 54, 214
- Social software, 53, 55, 56, 58, 65, 68
- Social Storage Cloud, 193, 196, 198–200
- Socio-technical ecosystem, 145
- SoCloud, 243–248, 254, 263
- Software creation, 167, 173, 178, 182
- Software crowdsourcing, 40, 45, 55, 74–79, 84, 86–88, 165, 180, 181, 187, 193
- Software crowdsourcing process, 5, 9, 20, 22, 75, 78, 88
- Software developer, 10, 41, 105, 174

- Software development, 4, 5, 7–10, 16, 19, 20, 22, 28, 165, 166, 168, 172, 173, 178–180, 184–187, 192, 194, 209, 213, 215, 220
- Software ecosystems, 21, 144
- Software engineering, 4, 9, 73, 76, 114, 167, 185, 187
- Software infrastructure, 53
- Software marketplace, 11
- Software quality, 15, 185
- Software requirement, 4
- Software trustworthiness rating model, 179
- Solution bidding, 13
- Sustainable ecosystems, vi
- Synchronous collaboration, 131, 133, 134, 139

**T**

- Task allocation problem, 46
- Task matching, 18, 46
- Task orchestration, 92
- Task solicitation, 13
- Team building, 40, *see also* Team formation
- Team selection, 39, 45
- Team work, 39, 45
- Temporal incentive mechanisms, 100
- Tensor
  - temporal tensor, 229
- Testing, 21, 61, 67, 78, 114, 120, 170, 181, 221–226, 232, 237, 239, 258
- Theoretical framework, 181
- TopCoder, 7, 12, 13, 16, 54, 119, 192, 213
- Traditional employment, 39
- Traditional software development, 64, 75, 114, 166, 192
- Trust and reputation, 39, 43–45
- TRUSTIE, 165, 168, 179–184, 188
- Trustworthiness analysis, 165, 168, 172, 173, 178, 188
- Trustworthy Software Development and Evolution, 172
- Trustworthy Software Model, 168

**U**

- User-contributed cloud fabric, 191
- Ushahidi, 54
- UTest, 88, 124, 213

**V**

- Virtual machine, 192, 202, 214
- Virtual organization, 75, 84, 194

Virtual team, [20](#), [114–116](#), [118](#), [119](#), [129](#)  
Volunteer computing, [206](#), [213](#)  
Volunteering, [28](#), [37](#), [239](#)

**W**

Web services, [219–222](#), [225](#), [227](#), [232](#), [239](#),  
[240](#)

Wikipedia, [20](#), [54](#), [56](#), [166](#), [221](#)  
Workforce motivation, [3](#)  
WS-TaaS, [222–224](#), [232](#)

**Z**

Zooniverse project, [64](#)