## INDEX

Absolutdata, 4, 170 AGI. See Artificial General	understanding the core of, 74–76
Intelligence (AGI)	unsupervised learning, 77
Ahmed, Nafeez Masada, 136,	Asaro, Peter, 82
163	Asimov, Isaac, 63
AHP. See Analytic hierarchy	
process (AHP)	Bateson, Gregory, 65, 79, 89
AI. See Artificial Intelligence (AI)	Bateson, Nora, 43, 70, 71, 72,
AIG, 4	170
Alibaba, 4	Berry, Benjamin, 139
Amazon, 75	Big Data, 2, 67–70, 91
Analytic hierarchy process (AHP),	Blackman, Reid, 160-161
101–102	Bloomberg, 44
Artificial General Intelligence	BPM. See Business process
(AGI), 3, 175	management (BPM)
robots, 2	Brant, Steve, 91, 183–184
Artificial Intelligence (AI), 2, 68,	Brewer, Joe, 88, 109
72-79	Brown, John Seely, 110
in context, 78–79	Brynjolfsson, Erik, 120
decision intelligence bridges	Busigence, 4, 170
from, 60–63	Business process management
DI as software engineering	(BPM), 112, 167
discipline for, 161	Business tracking discipline, DI as,
ethics and responsibility,	164
160-161	
expert systems, 77	Cable company sustainable
history: winters and summers,	energy generation,
73-74	142–143
market, 73	CAD. See Computer-assisted
natural language processing	design (CAD)
(NLP), 76	Call detail records (CDRs), 150
reinforcement learning (RL)	Carter Center, 143
systems, 77	Casart, Jim, 19, 83, 164,
supervised learning, 76–78	183, 184

Causal decision diagram (CDD),	responsibility without
10, 26–27, 33, 66, 70,	corresponding authority
72, 80, 83, 109–110,	and vice versa, 152–153
130, 135, 155, 156,	Cognitive capacity, $1-2$
157, 159, 161, 162	Cognitive science, 82
"A ha" moment, 49-50	Colorado Bureau of Investigation,
examples, 44, 50–51	76
as framework for integrating	Colossus: the Forbin Project, 175
other technologies,	Colucci, Michele, 177
44–49	Community Justice Advisors
invented, 42–43	(CJAs), 143
origins of, 41–42	Companies, organizational
telecom customer care, 50–51	influence mapping in,
Causal reasoning, 79–81	1.57
CDD. See Causal decision	Complexity ceiling, 52–57
diagram (CDD)	breaking through, 54–55
CDRs. See Call detail records	dimensions of complexity, 56
(CDRs)	handle complexity, 56
Chatbots, DI as generative model	leads to unintended
for, 162	consequences, 56–57
Churchill, Winston, 167	solutions to complexity,
Civilization, 1–2, 65–67	57–60
CJAs. See Community Justice	Complexity science, 83
Advisors (CJAs)	Complex systems, 82–83
Classic mistakes/best practices,	Computer-assisted design (CAD)
146–154	computer simulation,
allowing perfection, 151	103
confusing levers with externals,	Context, right decision in
149	changing, 63–64
confusing predictions with	Copernican revolution, 9
decisions, 154	The Crisis of Civilization, 163
confusing proxies with	Customer care, telecom, 50–51
outcomes, 149	Customer's likelihood to
decision modeling requires	recommend (L2R), 34,
sophisticated technical	36–37
background, 153–154	Cybernetics, 81–82
expecting consensus, 152	Cyber resurrectionist, 91
failing	•
to brainstorm outcomes, 148	DA. See Decision analysis (DA)
to communicate outcomes,	Data
146-147	Big Data, 2, 67–70, 91
miscommunications regarding	decision intelligence and,
delegated authority,	114–115
147–148	decisions before data, 51-52
over-reliance on data 149-151	Element Data, 5

emerging data scientist	as generative model for
specialist roles,	chatbots, 162
172-174	goal of, 65–66
"monochromatic tonality" of	for government planning,
data, 71	164–165
over-reliance on, 149-151	implementation, 110
terabytes of, 2	integration, 110
trump data, system dynamics,	for intelligence analysis,
91-92	165-166
warm data, $70-72$	as leadership and management
Da Vinci Co-op, 111	discipline, 159
Davis, Charles, 97, 176	LINK, 13–16
Decision analysis (DA), 101	mapping, 110
DecisionCloud, 170	as mechanism for human/
Decision engineering, 4	machine collaboration, 155–156
Decision Intelligence (DI), 4,	as mechanism for intelligence augmentation, 155–156
68-69, 168-169, 170,	as meeting discipline, 162
181, 182 as analysis framework for AI,	multiple levels at, 109–111
160–161	at NASA's Frontier
as basis for new form of	Development
dynamic "Wikipedia,",	Laboratory, 136–137
162–163	and new mythos, 174–175
as breakthrough technology to	optimization, 110
solve "wicked"	as personal decisions, 162
problems, 161–162	in practice, 22–24
bridges from AI/ML theory to	real-time decision model
practice, 60–63	tracking, 111
as business tracking discipline,	as risk management
164	framework, 160
combating wealth inequality	scenario comparison, 110
through, 178–180	sharing, 110
as context layer, 161	from simulation to
continuous improvement, 110	optimization, 84
consensus, 27–29	as software engineering
as core of software, 159	discipline for AI, 161
and data, 114–115	solutions renaissance, 6-10
ecosystem, 170–172	as technology that glues the
for education, 156	tech stack to human
extends machine learning,	stack, 158-159
46-49	as tool to support
as foundation for journalism in	decision making, 157
age of complexity,	understanding, 109–110
163–164	users of, 21–22

Decision intelligence deployments	collecting out-of-context
examples, 136–146	comments respectfully,
cable company sustainable	127–128
energy generation,	decision boundary, 124
142–143	proxy goals, 124–127
decision intelligence	determining the role of machine
in development and conflict,	learning, 131–134
143–146	setup, 116–118
for market decisions, 142	starting the meeting, 118–119
at NASA's FDL, 136-137	determining the project rules
innovation management,	of engagement,
140-141	118–119
multi-link decision, 139-140	using the model, 134–135
utilities and operators,	wiring up the model, 129–130
137–139	Decision modeling
web-based interactive decision	benefits, 112–113
model for training	examples, 113-114
decisions, 141–142	Decisions before data, 51–52
Decision makers, 66, 158–159	Decision tree, 79
Decision making	"Deflector Selector" project,
decision intelligence as tool to	136–137
support, 157	Deming, W. Edwards, 96
DI as generative model for	Democratization, 3
chatbots supporting,	Democratization power of
162	simplicity, 63
simulations, 86–87	Design and design thinking, 103
Decision model, 79	DI. See Decision Intelligence (DI)
benefits from, 111–112	Discipline Discipline
for training decisions,	decision intelligence as
141–142	leadership and
Decision model, building,	management, 159
116–135	DI as business tracking, 164
analyzing levers, 122–124	DI as meeting, 162
brainstorming externals, 128	Divergent-versus-convergent
brainstorming levers,	thinking, 115–116
121–122	DNVGL, 4, 170
brainstorming outcomes,	D1(( GL, 1, 170
119–121	Education, decision intelligence
tangibles and intangible	for, 156
goals and outcomes,	Edvinsson, Håkan, 59, 130, 183,
120-121	184
breadth before depth, 130–131	
convergent phase: analyzing	eHealthAnalytics, 4, 170
outcomes and goals,	Element Data, 4, 5
124-128	ElementData, 176

Emerging data scientist specialist	Getahun, Beza, 184
roles, 172–174	Gilling.com, 4
Englebart, Doug, 15, 101,	Global Challenges Collaboration
183–184	(GCC), 168
EPCOT. See Experimental	Golon, Allie, 183
Prototype City of	Gongos, 4, 170
Tomorrow (EPCOT)	=
Ergonomics, 82	Google, 4, 67, 72–73, 90
European telecommunications	Government planning, DI for,
company, 53	164–165
± • •	Governments, organizational
EvenClever, 170	influence mapping in,
Evidence-based decision making,	157
20–21	Groupon, 4
Experimental Prototype City of	Grubhub, 4
Tomorrow (EPCOT),	Gupta, Arnab, 100
175	1 ,
	Hanh, Thich Nhat, 176
Facebook, 75, 77, 81	Harrison, George, 119
Fair Isaac, 4	Hauser, Avi, 183
False proxies, 18–19	Headwind of disruption,
Fast-moving Consumer Goods	168–170
(FMCG) company, 140	
FDL. See Frontier Development	Helmer, Nicole, 171–172
Laboratory (FDL)	Hobbes, Michael Hobbes,
Fenwick, Bill, 184	144–146
Ferose V. R., 179, 180, 183	Hook, Anselm, 86
FICO, 170	Hopp, Faith, 184
Fisher, Ruth, 39–40, 91–92, 184	Horwood, Jennifer, 183
FMCG company. See Fast-moving	Human collaboration, decision
Consumer Goods	intelligence as
(FMCG) company	mechanism for,
Foresight, 84–85	155-156
Forrester, Jay, 91	Human-computer interaction
Frontier Development Laboratory	(HCI), 82
(FDL), NASA, 136–137	Hype feedback loop, 10–11
	11) pe 100 a a a a a a a a a a a a a a a a a a
"Deflector Selector" project,	IA. See Intelligence augmentation
136–137	(IA)
Fruehauf, Jennifer, 183	
Fuller, Buckminster, 88, 109	IDEO, 103
	InfoHarvest, 4, 170
Game theory, 103–104	Inouye, Liesl, 183
Gandhism, 178–180	Intelligence analysis, DI for,
Gates, Bill, 73	165–166
GCC. See Global Challenges	Intelligence augmentation (IA),
Collaboration (GCC)	97-101

Legal and policy decisions, decision intelligence as mechanism for, 176 - 177155 - 156Levine, Jeanne, 184 IntelliPhi, 140 Likelihood to recommend (L2R), Interface, 9 34,36-37Interdependencies and Link whack-a-mole, 87–89 cause-and-effect, 16–20 Invisible Engines, 92 DI, 13–16 LTT project. See Launch To Jaret, Jessica, 184 Tomorrow (LTT) Johnson, Margaret, 183–184 project Jones, Milo, 67 Lumina Decision Systems, 4 Julian, Arlow, 183 Jung, Carl, 43 Machine collaboration, decision intelligence as Källmark, Göran, 183 mechanism for, 155 - 156Kemp, Linda, 104–105, 183–184 Kerbel, Josh, 6, 88–89 Machine learning (ML), 72–79 **Key Performance Indicators** decision intelligence bridges (KPIs), 87-88from, 60-63Klaus Schwab's Fourth Industrial model, 37–38 Maiorana, Charlotte, 184 Revolution, 170 KM. See Knowledge management Malcolm, Nadine, 183, 184 (KM) Management discipline, decision Knowledge Gardens, 178 intelligence as, 159 Knowledge management (KM), Management Science, 85 104 - 105Manney, PJ, 174–175 Market decisions, decision Kort, Barry, 91 Kozyrkov, Cassie, 5, 9, 61, intelligence for, 142 169–170, 183–184 Martin, Roger L., 33 KPIs. See Key Performance Mastercard's DI initiative, 4 Indicators (KPIs) McChrystal, Stanley, 87 McKinsey, 67 L2R. See Likelihood to McMullen, John, 65 Meeting discipline, DI as, 162 recommend (L2R) Ladd, Rick, 104, 105, 183–184 Microsoft, 4, 69 Lamb, Alex, xi-xiii Millennium Project, 65 Landau, Valerie, 100-101, 157, MITRE Corporation, 86 183 - 184ML. See Machine learning (ML) Laszlo, Kathia Castro, 176 Multi-link decision, 139–140 Launch To Tomorrow (LTT) project, 85, 165 NASA, 5 LeCun, Yann, 81 NASA's Frontier Development Leadership discipline, decision Laboratory (FDL),

intelligence as, 159

136 - 137

National Oceanic and Quantellia, 4, 87, 111, 139–140, 142–143, 144, 170, Atmospheric 173, 183 Administration (NOAA), 67 Natural language processing Raghavendra, Kamesh, 179 (NLP), 76, 176–177 Reality stack, 158 Nemmers, Janet, 183 RECAP project, 67 Nitz, Elizabeth, 184 Reductionism (analysis), 6 NLP. See Natural language Return on its investment (ROI), processing (NLP) 140 NOAA. See National Oceanic and Rich, Rob, 183-184 Atmospheric Risk management framework, Administration (NOAA) decision intelligence as, Oliver, Ian, 183 Robots, organizational, 175 O'Neil, Ryan, 86, 87 ROI. See Return on its investment Online stochastic combinatorial (ROI) optimization (OSCO), Ronis, Sheila, Dr., 84–85, 96 Rowling, J. K., 91–92 Opera Solutions, 100 Operations research (OR), 85–86 Saaty, Thomas L., 102 OpsPro, 170 Salvatico, Yvette Montero, 1, OR. See Operations research (OR) 52-53, 181, 183-184 Organizational influence mapping in organizations/companies and SAP, 5, 170, 171–172, 180, 183 governments, 157 Satavia, 4, 170 Organizational robots, 175 SDP. See Society of Decision Organizations, organizational Professionals (SDP) influence mapping in, Sherer, James A., 176–177 1.57 Silberzahn, Philippe, 67 OSCO. See Online stochastic Silicon Valley Sim Center, 87 combinatorial Simulation organizations, 86–87 optimization (OSCO) Simulations, decision making, 86 - 87Panjabi, Raj, 144 Smith, Cymbre, 184 Park, Jack, 178, 184 Smith, Dave "Tex,", 111 Pearl, Judea, 115, 149 Smith, Griffin, 184 Pfeffermann, Guy, 184 Smith, Richard, 184 Populating links, 101–102 Snowden, Dave, 83 PowerNoodle, 4, 170 Society of Decision Professionals Pratt, Annis, 184 (SDP), 101 Pratt, Lorien, 178–179, 182 Software engineering discipline, Prospective models, 21, 32 Prowler.io, 4, 5, 77–78, 170 for AI, 161 PureTech, 4, 170 Solutions renaissance, 7-8, 9-10

Spencer, Frank, 1, 52–53, 61, 165, 167, 181, 183–184	TransVoyant, 4 Trusteeship, 178–180
Stavrou, Nick, 183	Uber, 4
Supporting decision making, DI as generative model for	Urbint, 4
chatbots, 162 Sustainable energy generation,	Value network analysis (VNA), 151
cable company,	van Gelder and Monk, 4
142–143	Vilas, Deb, 184
Sympatico, 170	Visual spatial, 25
Synthesis, 6 System dynamics, 90	VNA. See Value network analysis
System dynamics, 90 System dynamics, 91–96	(VNA)
fishing example, 92–96	
trump data, 91–92	Walt Disney, 175
System Dynamics Society, 91	Ward Bank, 34, 39
Systems analysis, 89–96	Warm data, 70–72
importance of, 96	Watts, Alan, 174
in management science, 96	Wealth equity index (WEI), 179
	Web-based interactive decision
Tabarrock, Alex, 91–92	model, for training
Team of Teams (McChrystal), 87	decisions, 141–142
Technology stack, 158	Web of wicked problems, 65–67
Telecom company, 41, 88, 139,	WEI. See Wealth equity index
150	(WEI)
Telecom customer care, 50–51	Whitelock, Karl, 183–184
Terabytes of data, 2	Wicked problems DI as breakthrough technology
Thaker, Anand, 140	to solve, 161–162
Thinking, divergent-versus-	web of, 65–67
convergent, 115–116	Wiener, Norbert, 82
Thomas, Sammy, 183 TM Forum, 68	World Makers, 86
Total quality management	World of Warcraft video game,
(TQM), 167	156
TQM. See Total quality	100
management (TQM)	Zangari, Mark, 41, 96, 139-140,
Transfer learning, 96–97	
	168, 183