Contents

	eduction—Have We Opened Pandora's Box?	
1.1	Global Financial, Economic and Public Spending	
	Crisis	
1.2	Need of a "Knowledge Accelerator"	
1.3	We are Experiencing a Digital Revolution	
1.4	Threats to the Average Citizen	
1.5	Threats so Big that One Cannot Even Talk About	
	Them	
1.6	Are we Entering an Age of Discrimination?	
1.7	Threats to Companies	
1.8	Political and Societal Risks	
1.9	Are the Secret Services Democratically well	
	Controlled?	
1.10	What Kind of Society are we Heading to?	
1.11	"Big Governments" Fueled by "Big Data"	
1.12	We Must Move Beyond September 11	
1.13	What Needs to be Done	
1.14	A Better Future, Based on Self-Regulation	
Refere	ences	
Lost	Robustness	
2.1	Understanding Complex Systems	
2.2	Criticality and Lack of Transparency	
2.3	Acceleration and De-Compartmentalization	
	·	

2.4	Systemic Stability and Trust
2.5	Utilizing Control Features of Complex Systems
2.6	Author Information
Но	w and Why Our Conventional Economic
Thi	inking Causes Global Crises
3.1	"More Networking Is Good and Reduces Risks"
3.2	"The Economy Tends Towards an Equilibrium State"
3.3	"Individuals and Companies Decide Rationally"
3.4	"Selfish Behavior Optimizes the Systemic
3.5	Performance and Benefits Everyone" "Financial Markets Are Efficient"
3.6	
-,0	"More Information and Financial Innovations Are Good"
3.7	Good"" "More Liquidity Is Rottor"
3.8	"More Liquidity Is Better"
0	"All Agents can Be Treated as if Acting the Same Way"
3.9	"Regulation can Fix the Imperfections of Economic
	Systems"
3.10	"Moral Behavior Is Good for Others, but Bad for
_	Oneself"
3.11	Summary
Furth	er Reading
"Net	tworked Minds" Require a Fundamentally
New	Kind of Economics
4.1	Evolution of "Friendliness"
4.2	Networked Minds Create a Cooperative Human
	Species
4.3	A Participatory Kind of Economy
A Ne	w Kind of Economy is Born—Social
Deci:	sion-Makers Beat the "Homo Economicus"
٥, ١	Outdated Theory, Outdated Institutions
5.2	New Institutions for a Global Information Society .
	- 2.3500 mornation 30clety.

5.3	Benefits of a Self-Regulating Economy
5.4	Economics 2.0: Emergence of a Participatory
	Market Society
Refer	ences
Furth	er Reading
Glob	al Networks Must be Redesigned
6.1	Living in a Hyperconnected World
6.2	Our Intuition of Systemic Risks is Misleading
6.3	A Global Ticking Time Bomb?
6.4	Global Networks Must be Redesigned
6.5	Coming Era of Social Innovation
6.6	Creating and Protecting Social Capital
Bia	Data—A Powerful New Resource for the
_	nty-first Century
7.1	Data Sets Bigger than the Largest Library
7.2	What Do Applications Look Like?
7.3	The Potentials Are Great
7.4	but also the Implicit Risks
7.5	The Digital Revolution Creates an Urgency to Act .
7.6	Europe can Become a Motor of Innovation for the
Rofo	Digital Era
	ogle as God? Opportunities and Risks of the ormation Age
8.1	Introduction
8.2	Gold Rush for the Twenty-first Century Oil
8.3	Humans Controlled by Computers?
8.4	Is Privacy Still Needed?
8.5	Information Overload
8.6	The Knowledge-Is-Power Society
8.6	A New World Order Based on Information?
	Privacy and Socio-Diversity Need Protection
8.8 8.9	An Alternative Vision of the Information Age
~ ~	ALL ARCHIMITYE VISION OF THE INTOHOROUS ACC

хi

Contents

	8.1 8.1		Democratic, Participatory Market Society	89
	8.12		Paradigm to Manage Complexity	90
	8.13	B Loss o	w Paradigm to Manage Complexity of Control due to a Wrong Way of Thinking .	90
	8.14	1 Decisi	ons Needed to Use Opportunities and Avoid	91
	Furt	Risks	ng	92 92
9	Froi	n Techr	nology-Driven Society to Socially	
	Orie	ented Te	echnology: The Future of Information	
	20Cl	ety—A	Iternatives to Surveillance	95
	Appe	enaix: w/	ny Mass Surveillance Does Not Work	100
	ruitii	ier keadir	ng	102
10	Bia I	Data So	siotu Ana of Donot di	
	Disci	riminati	ciety: Age of Reputation or Age of	
	10.1	Inform	ion?	103
		for Dat	ation Box: How to Define Quality Standards	
	Refere	ences	a Mining	111
1 4				113
! !	Big D	ata, Pri	ivacy, and Trusted Web: What Needs	
	to Be	Done		115
	11.1	Ethical	and Policy Issues Related with	
		Socio-E	conomic Data Mining	115
		11.1.1	A Source-Based Taxonomy of Available	_
		_	Personal Information	116
		11.1.2	Why Would the Honest be Interested to	_
			Hide?	121
		11.1.3	Cyber-Risks and Trust	130
		11.1.4	Current and Future Threats to Privacy	131
		11.1.5	Additional Ethical Concerns	135
		11.1.6	How to Address Ethical Issues in	
	11.2	Town	Large-Scale Social Data Mining	136
	11.4	11 2 4	Privacy-Preserving Data Analyses	137
		11.2.1 11.2.2	Deliberate Participation	138
		11.2.2	Anonymization and Randomization	139

Contents	XIII

		11.2.3	Coarse-Graining, Hierarchical Sampling,	
			and Recommender Systems	141
		11.2.4	Multiplayer Online Games, Pseudonyms,	
			and Virtual Identities	144
		11.2.5	Anonymous Lab Experiments	146
	11.3	Concep	t of a Future, Self-organizing and Trusted	
		,		149
		11.3.1	Data Format	149
		11.3.2	Intellectual Property Rights	152
		11.3.3	Trust Management	153
		11.3.4	Microcredits and Micropayments	156
		11.3.5	Transparent Terms of Service	157
		11.3.6	Privacy-Respecting Social Networks	159
		11.3.7	Summary	160
	11.4	Recomi	mended Legal Regulations	160
	11.5	Recomi	mended Infrastructures and Institutions	165
	11.6	Summa	ary	166
				168
	Furthe	er Readin	g	175
12	Wha	t the Di	igital Revolution Means for Us	177
	12.1	Big Dat	ta: A magic Wand. But do we know How to	
		Use it?		177
	12.2	What Is	s the Next Big Thing After Big Data?	178
	12.3	A New	Kind of Economy is Born	182
	12.4	The Ne	w Algebra of Prosperity and Leadership	184
	12.5	What [Does it Take to Master Our Future?	185
13	Crea	tina ("	Making") a Planetary Nervous	
-			Citizen Web	189
	13.1		are the Benefits of Having an "Internet of	
			"?	190
	13.2	_	lements of the Planetary Nervous System	191
	13.3	Creatir	ng a Public Good, and Business and	
		Non-P	rofit Opportunities for Everyone by Maximum	
		Openr	ness, Transparency, and Participation	192
	13.4	The Ro	ole of Citizen Science	193