

Contents

1	Introduction	10
1.1	The Explorative Journey of this Thesis	10
1.2	The Structure of this Thesis	15
1.3	List of Publications	15
2	State of the Art	17
2.1	Problematic Developments in the Computing Industry	18
2.1.1	Surveillance Capitalism	18
2.1.2	Surveillance Capitalism and Regulation	19
2.1.3	A Technological Alternative to Surveillance Capitalism	20
2.2	The Monetary System, Libra and CSAs	21
2.2.1	Economic, Financial and Monetary System	21
2.2.2	Our Conventional Monetary System	22
2.2.3	Currency Innovation	24
2.2.4	Sustainable Agriculture	26
2.3	Distributed Ledger Technology	28
2.3.1	Blockchain	28
2.3.2	The Energy Problem	34
2.3.3	The Scaling Problem	37
2.3.4	Post-Blockchain DLT	41
2.3.5	Distributed Ledger Money	41
2.3.6	DLT for Agriculture	43
2.3.7	DLT in HCI and CSCW	44
3	Methodology	46
3.1	IT Infrastructure and the First Case Study	46
3.2	The Second Case Study	47
4	The High Cost of Free Services	48
4.1	Surveillance Capitalism	48
4.2	Problems	50
4.2.1	Consumerism and Excessive Consumption	51
4.2.2	Threats to Government and Democratic Processes	51
4.2.3	Privacy Concerns	52
4.2.4	Concentrations of Wealth and Power	53
4.2.5	Economic Growth and Sustainability	53

Contents

4.3	Steps Toward Solutions	53
4.3.1	Education	54
4.3.2	Regulation	54
4.3.3	Resistance	56
4.4	A Partial Solution	58
4.5	Issues of Funding and Control	59
4.5.1	Public Funding	59
4.5.2	NGOs and Cooperatives	60
4.5.3	No Funding or Minimal Funding	60
4.6	Toward a More Radical Solution	60
4.6.1	Desired Characteristics	61
4.6.2	Returning Control to the Users	62
4.6.3	Revisiting Funding Options	65
4.6.4	Open Problems	65
4.7	Conclusions	66
5	Problems with Surveillance Capitalism and Possible Alternatives for IT Infrastructure	67
5.1	Introduction	67
5.2	Problematic Developments in the Computing Industry	68
5.2.1	The Technological Infrastructure	69
5.2.2	Problems for Democracy and Sustainability	70
5.3	Possible Solutions	71
5.3.1	Regulation and Law	72
5.3.2	Technology	76
5.3.3	Suggestions for Citizens and Civil Society Organizations	78
5.3.4	Funding, Ownership, and Control	79
5.4	Conclusion	82
6	Toward Emancipatory Currencies	83
6.1	Introduction	83
6.2	State of the Art: Digital Money	84
6.2.1	Monetary Theory	84
6.2.2	Our Conventional Monetary System	85
6.2.3	Complementary Currencies	86
6.2.4	Distributed Ledger Money	87
6.2.5	Blockchain Cryptocurrencies	87
6.2.6	Private Ledger Currencies	89
6.2.7	Central Bank Digital Currencies	89
6.2.8	Post Blockchain Technology	90
6.3	Libra - Description and Prospect	90
6.3.1	Libra	90
6.3.2	A Prospect	92
6.3.3	Monetization of the Payment Infrastructure	92

Contents

6.3.4	Sanctioning Power	93
6.3.5	Reduction of the Reserve Ratio	94
6.3.6	Abandoning the Reconvertibility	94
6.4	Discussion	95
6.4.1	Regulation	96
6.4.2	Etatism, Laissez-faire and Nationalism	97
6.4.3	Matching with the Five Monetary Divides	98
6.4.4	Concluding Remarks	99
6.5	Towards Emancipatory Cybercurrencies	100
6.5.1	Scalability at Reseasonable Ecological Impacts	100
6.5.2	Democratic Legitimation	100
6.5.3	Fostering the Sovereignty of Consumers	100
6.5.4	Protection against Extraction	101
6.5.5	Counteracting Monopolies	101
6.5.6	Responsible Energy Consumption	101
6.5.7	Preservation of Value	101
6.5.8	Avoiding the Logic of Consumerism	102
6.5.9	Respecting Ecological Carrying Capacities	102
6.6	Conclusions	103
7	Community Supported Agriculture	104
7.1	Introduction	104
7.2	State of the Art	106
7.2.1	Sustainable HCI	106
7.2.2	The Connection to Money	107
7.3	Research Context	108
7.3.1	The Research Site	108
7.3.2	Methodology	109
7.4	Money, Solidarity and Commitment	110
7.4.1	Distribution	111
7.4.2	"Luzerne" as a Monetary Unit	113
7.4.3	The Topology of Trust	114
7.4.4	CSA Properties	115
7.4.5	A Holistic Understanding of CSA	116
7.5	Discussion	117
7.5.1	Values at stake at the Luzernenhof	118
7.5.2	The Luzernenhof solution to demand orientation	119
7.5.3	At the Frontier of CSAs	121
7.5.4	A Potential for IT?	122
7.5.5	Surveying the Innovation Gap	123
7.5.6	Distributed Ledger Technology	125
7.6	Conclusions	126

Contents

8	Bringing the Different Strands Together	128
8.1	A Surveillance Capitalism perspective on the Case of Libra	128
8.2	Contrasting the Currency Case Studies	129
8.3	Lessons for the Monetary System	131
8.4	The Issue of Technological Sovereignty	133
8.5	A New Old Paradigm in IT	134
8.6	Complementary Methodologies	135
9	Conclusion	139