

Markus Gerold

---

# **The Automation of Consumption Decisions**

A predictive analysis of the influence of the  
automation of consumption-relevant  
decisions on consumer sovereignty

*Markus Gerold*  
The Automation of Consumption Decisions

Markus Gerold

---

# **The Automation of Consumption Decisions**

A predictive analysis of the influence of the automation of consumption-relevant decisions on consumer sovereignty

## **Imprint**

© 2024 Steinbeis-Edition

All rights reserved. No part of this book may be reprinted, reproduced, or utilised in any form by any electronic, mechanical, or other means now known or hereafter invented, including photocopying, microfilming, and recording or in any information storage or retrieval system without written permission from the publisher.

Markus Gerold

The Autonomation of Consumption Decisions. A predictive analysis of the influence of the autonomation of consumption-relevant decisions on consumer sovereignty

1st edition, 2024 | Steinbeis-Edition, Stuttgart

ISBN 978-3-95663-302-7

Likewise Steinbeis University, dissertation 2022

Layout: Markus Gerold | Technical Editing: Steinbeis-Edition

Publishing house: Steinbeis-Edition | Steinbeis-Stiftung, Adornostraße 8, 70599 Stuttgart

Production: e.kurz+co druck und medientechnik gmbh, Kernerstraße 5, 70182 Stuttgart

The platform provided by Steinbeis makes us a reliable partner for company startups and projects. We provide support to people and organizations, not only in science and academia, but also in business. Our aim is to leverage the know-how derived from research, development, consulting, and training projects and to transfer this knowledge into application – with a clear focus on entrepreneurial practice. Over 2,000 business enterprises have already been founded on the back of the Steinbeis platform. The outcome? A network spanning 5,200 experts in approximately 1,100 business enterprises – working on projects with more than 10,000 clients every year. Our network provides professional support to enterprises and employees in acquiring competence, thus securing success in the face of competition. Steinbeis-Edition publishes selected works mirroring the scope of the Steinbeis Network expertise.

227309-2024-04 | [www.steinbeis-edition.de](http://www.steinbeis-edition.de) | [edition@steinbeis.de](mailto:edition@steinbeis.de)

## Preface

This thesis was created during my time as a research associate for the chair of marketing and dialogue marketing at the Steinbeis Hochschule. Mapping out and writing a doctoral thesis is no easy endeavor. It requires not only the right concept, academic knowledge and endurance, but also a supporting network of colleagues, family and friends. Therefore, I want to wholeheartedly thank everyone who supported me during this journey in one way or the other and lent me a helping hand when I needed it.

My greatest gratitude goes out to my academic teacher and supervisor Prof. Dr. Dr. Schneider. He not only most substantially inspired the topic of this thesis, but he also encouraged me in every step of the process. Without his valuable, critical input, the completion of this thesis would not have been possible. I fondly remember many long discussions in which he gave the decisive clue to find the most optimal solution. His unconventional, goal-oriented way of thinking will accompany me even beyond my academic work and professional career. I also want to thank Prof. Dr. Andreas Mann for taking over the role of the second reviewer and all the advice he gave me during the process. Thank you also to my former colleagues at the chair of marketing who made my time there not only educational but also very pleasant: Dr. Frederik Ferié, Dr. Anja Quednau, Dr. Viktoria Ritter, Claudia Seiler and Dr. Ann-Kathrin van Hülsen.

I am also very grateful to my family. They have given me the necessary backing so I could move, study and explore new possibilities. My parents, Monika and Roland Gerold, raised and nurtured me in more than one way and their home has always been my safe haven. Together with my grandparents, they cared for me, broadened my horizon and provided me with financial support. Thank you for always being there for me in all those years. Thank you also to everyone who helped me review the thesis: Eva Schnizel, Dr. Viktoria Ritter, Felicitas Fleck, James Cocker and Jamie Green, as well as all my interview partners and everyone who gave me advice or recommendations.

Berlin, August 2022

*Markus Gerold*

## Table of Contents

<b>List of figures .....</b>	<b>10</b>
<b>List of tables .....</b>	<b>10</b>
<b>Summary .....</b>	<b>12</b>
<b>Zusammenfassung .....</b>	<b>16</b>
<b>A    <b>Changing Consumer Worlds – The autonomation of consumer decisions.....</b></b>	<b>20</b>
1    A new technological era of making decisions.....	23
2    Digital transformation and the 4th industrial revolution.....	27
2.1 Economy.....	28
2.2 Politics.....	29
2.3 Privacy.....	30
2.4 Autonomy.....	31
2.5 Power distribution .....	32
3    Consumer protection and consumer sovereignty .....	35
3.1 Consumer protection as a public task.....	36
3.2 Consumer sovereignty and the law .....	37
4    Research objectives and contextualization.....	40
4.1 Research question.....	40
4.2 Research agenda and design.....	40
4.3 Definition of central concepts .....	47
4.3.1 Automation .....	47
4.3.2 Autonomation .....	47
4.3.3 Consumer Sovereignty .....	48
4.4 Addressors of practical implications.....	48
<b>B    <b>Conceptualization: Theoretical foundations – Decision autonomation and consumer power .....</b></b>	<b>51</b>
1    From automation to autonomation – changes in decision-making processes through technology .....	51
1.1 General concept of automation .....	51
1.2 Original concepts of decision automation.....	53
1.3 Decision automation in the digital age.....	59

1.3.1	Algorithms, big data and artificial intelligence .....	59
1.3.2	Algorithmic decision-making .....	65
1.4	Autonomous decision-making systems .....	68
1.5	Consequences of decision automation and automated decision-making .....	74
2	Ethical discussions of autonomous systems .....	79
2.1	Machine ethics .....	79
2.2	Autonomous driving .....	81
2.3	Autonomous weapon systems .....	84
2.4	Autonomous medical decision-making systems .....	87
2.5	Summarizing the ethical debate .....	88
3	Decision automation in consumption .....	91
3.1	Trends and technologies .....	93
3.2	Advertisement .....	93
3.3	Wearables .....	94
3.4	Digital Nudging .....	95
3.5	Algorithmic Marketing .....	96
3.6	Digital Voice Assistants .....	97
3.7	Consequences of decision automation in consumption .....	99
3.7.1	Diminishing actual and perceived consumer autonomy .....	99
3.7.2	Discrimination .....	101
3.7.3	Data protection, surveillance and manipulation .....	103
3.7.4	A shift in power dynamics in the economic field .....	105
4	Consumer policy .....	107
4.1	Conceptual models of consumers .....	107
4.1.1	The Empowered Consumer .....	109
4.1.2	Other Consumer Models .....	111
4.2	Consumer protection policy .....	113
5	Consumer Sovereignty and Consumer Power .....	116
5.1	The normative principle: consumer sovereignty .....	116
5.1.1	Theoretical origins of consumer sovereignty .....	116
5.1.2	The principle of consumer sovereignty .....	119
5.1.3	Consequences and critique .....	121
5.2	The descriptive model: consumer power .....	124
5.2.1	Concepts of power .....	125
5.2.2	From power to consumer power .....	126
6	Conclusions of the theoretical chapter .....	132

<b>C</b>	<b>Empirical analysis of consumption decision automation and consumer power.....</b>	<b>135</b>
1	General research design .....	135
2	Understanding automation in consumption contexts .....	139
2.1	Empirical research objectives.....	139
2.2	Research method .....	140
2.3	Research process .....	142
2.3.1	Design of the interview guideline.....	143
2.3.2	Selection of interviewees.....	147
2.3.3	Conduction of interviews .....	149
2.3.4	Transcription of data material .....	152
2.3.5	Data analysis.....	152
2.3.6	Final results .....	154
2.4	Measurements.....	155
2.5	Interview Results.....	157
2.5.1	Meaning and significance of autonomous decision-making .....	157
2.5.2	Status quo in the consumption sector .....	162
2.5.3	Development forecast.....	169
2.5.4	Anticipated effects.....	172
2.6	Conclusions from the expert interviews.....	174
3	Anticipating the effects of decision automation for consumer sovereignty.....	177
3.1	Empirical research objectives.....	177
3.2	Research method .....	178
3.3	Research Process .....	182
3.3.1	Questionnaire design .....	183
3.3.2	Selection of respondents.....	185
3.3.3	Survey round I.....	186
3.3.4	Evaluation of results of round I.....	186
3.3.5	Survey round II.....	187
3.3.6	Evaluation of results of round II.....	189
3.3.7	Selection of final results .....	189
3.4	Measurements.....	190
3.4.1	Construction of the independent variable.....	190
3.4.2	Construction of the dependent variable .....	191
3.4.3	Final Interpretation of dimensions and items .....	208
3.5	Survey results .....	213



3.5.1	Results of the first Delphi round .....	213
3.5.2	Results of the second Delphi round.....	223
3.5.3	Selection of final results .....	232
3.5.4	Conclusion of the Delphi Study .....	234
<b>D</b>	<b>Discussion: Conclusion, critical reflections and implications of results .....</b>	<b>236</b>
1	Evaluating the need for action.....	236
1.1	Empirical research objectives.....	236
1.2	Research design.....	237
1.2.1	Methodology of intervention.....	237
1.2.2	Construction of questionnaire.....	239
1.3	Survey results .....	242
1.3.1	Quantifiable results.....	242
1.3.2	Results for the single dimensions of consumer sovereignty .....	248
1.3.3	Concluding results .....	263
2	Summary of central results.....	271
2.1	Study I: Estimating the relevance and development of the phenomenon .....	271
2.2	Study II: Anticipating the consequences of decision automation in consumption for consumer sovereignty.....	274
2.3	Study III: Mapping the need for intervention and illustrating possible action alternatives.....	276
3	Critical reflections of results .....	279
3.1	Theoretical limitations.....	279
3.2	Methodological limitations .....	281
4	Implications.....	284
4.1	Implications for society and governments .....	284
4.1.1	Regulation.....	285
4.1.2	Education.....	290
4.1.3	Involvement.....	292
4.2	Implications for managerial practice.....	294
4.3	Implications for science .....	306
5	Further Research .....	309
	<b>Appendix .....</b>	<b>310</b>
	<b>Bibliography.....</b>	<b>368</b>

## List of figures

Figure 1: Development trends in automation .....	24
Figure 2: Conceptual framework.....	42
Figure 3: Automation design considerations .....	54
Figure 4: The evolution of artificial intelligence.....	64
Figure 5: Different systems of algorithmic decision-making.....	66
Figure 6: Multilevel-schema of autonomy and control .....	69
Figure 7: Consumer Exit, Voice and power on the internet .....	128
Figure 8: Conceptual framework of consumer empowerment process .....	130
Figure 9: Overview of the general research design .....	135
Figure 10: Process of conducting Study I.....	143
Figure 11: Five stage model of consumer buying process .....	146
Figure 12: Picture of the filled in taxonomy from interview 4.....	151
Figure 13: Derived taxonomy of decision automation in consumption from expert interviews .....	166
Figure 14: Process of the Delphi method .....	179
Figure 15: A classification of consensus seeking methods .....	181
Figure 16: Process of conducting Study II .....	182
Figure 17: Presentation of the results of round I in round II .....	188
Figure 18: Construction of Consumer Sovereignty scale.....	208
Figure 19: Conclusion of findings from Study III.....	266
Figure 20: Dashboard to support consumer sovereignty in consumption .....	302

## List of tables

Table 1: Taxonomies of automation.....	56
Table 2: Taxonomy of automation .....	57
Table 3: Characteristics of autonomous decision-making systems.....	72
Table 4: Development of decision automation technologies .....	163
Table 5: Framework and weights of the Consumer Empowerment Index.....	194
Table 6: Preliminary item pool for Consumer Skills, Awareness of.....	198
Table 7: Consumer Empowerment .....	199
Table 8: Preliminary item pool for Personal Power and Social Power .....	200
Table 9: Preliminary item pool for Voice Power and Exit Power.....	202
Table 10: Criteria for Digital Sovereignty in reference to platforms .....	204
Table 11: Preliminary item pool for Data Sovereignty .....	205

Table 12: Types of algorithmic bias.....	206
Table 13: Preliminary item pool for Machine Bias .....	207
Table 14: Respondents' self-evaluated expertise .....	214
Table 15: Respondents' self-evaluated expertise .....	214
Table 16: Respondents' fields of expertise.....	215
Table 17: Evaluation of the likelihood of the scenario, first Delphi round .....	216
Table 18: Evaluation of consumer sovereignty today, first Delphi round.....	217
Table 19: General results of the first Delphi round .....	219
Table 20: Group comparison between pessimists and optimists, first Delphi round.....	221
Table 21: Areas of expertise of respondents, second Delphi round .....	224
Table 22: Evaluation of the likelihood of the scenario, second Delphi round .....	224
Table 23: Respondents' certainty of individual dimensions' assessments.....	225
Table 24: Evaluation of consumer sovereignty today, second Delphi round.....	226
Table 25: General results of the second Delphi round .....	229
Table 26: Group comparison between pessimists and optimists, second Delphi round .....	231
Table 27: Percental deviation factor between round 1 and 2 of the Delphi survey.....	233
Table 28: Criteria for the implementation of measures .....	239
Table 29: Variables, questions and their scaling in Study III.....	241
Table 30: General results for the necessity of intervention.....	244
Table 31: General results for the intensity of intervention.....	246
Table 32: Descriptive statistics for the scope of action .....	248
Table 33: Overview over types of measures .....	249
Table 34: Measured values for Consumer Skills.....	251
Table 35: Measured values for Awareness of Consumer Rights .....	252
Table 36: Measured values for Consumer Engagement.....	254
Table 37: Measured values for Personal Power .....	255
Table 38: Measured values for Social Power .....	257
Table 39: Measured values for Exit Power .....	258
Table 40: Measured values for Voice Power.....	260
Table 41: Measured values for Data Sovereignty .....	261
Table 42: Measured values for Machine Bias .....	263
Table 43: Proposed types of measure for individual dimensions of consumer sovereignty .....	264

## Summary

The digital transformation of the 21st century constitutes an incisive development which can be described as the fourth technological revolution and allows for radical new possibilities of transferring work to technical systems. This is especially true for the adoption of certain tasks by decision-making systems which are supposed to relieve humans physically but in particular cognitively in decision-making processes. This trend can be observed, for example, in the context of vehicle control. Decision-making systems have so far offered primarily low-level decision support, for instance with the highlighting and evaluating of potential decision alternatives. More recent decision-making systems, however, are able to execute tasks in decision-making processes without human intervention on an unprecedentedly high level. Such decision-making tasks can comprise the independent initiation of decision-making processes or the formulation of abstract decision goals.

This development is made possible by two essential drivers of digital technology: big data and artificial intelligence, for both of which algorithms constitute the basis of their decision-making rules. Big data applications support the inclusion of an enormous number of data points into their algorithmic decision-making processes. Artificial intelligence grants decision-making systems the ability to combine existing rules and data points in such a new way that they are capable of advancing their own structures without human input. Such systems are therefore about to reach a high degree of autonomy from human control and influence. In the near future, the final stage of this evolution could be found in fully autonomous decision-making systems.

The development of decision-making systems to date can thus be designated as automation as it was put into effect under the premise of fixed, human-defined decision-making rules. This new form of designing decision-making systems created by the embedding of big data and artificial intelligence, on the other hand, can be described as autonomation, meaning the development towards autonomous systems. Fully autonomous systems can be distinguished by their independent rule-making, rule adaption and organization, proactive goal setting and the absence of influence from human users.

The digital transformation constitutes an incisive development which allows for radical new possibilities of transferring work to technical systems. This is especially true for the adoption of certain tasks by decision-making systems which are supposed to relieve humans physically but in particular cognitively in decision-making processes. Recent decision-making systems are able to execute tasks in decision-making processes without human intervention on an unprecedentedly high level. This can be observed in a multitude of contexts from navigation, surveillance and warfare to medicine and economy. Especially in economical decision-making, the implementation of decision-making systems in various forms has greatly increased in the last few years. This dissertation examines the phenomenon of decision automation in consumption decisions from the perspective of consumer protection, analyzes the development of the phenomenon and asks the question of how this phenomenon can be critically evaluated with regard to the principle of consumer sovereignty. The dissertation also proposes a model for the measurement of consumer sovereignty and develops solutions for a possible decline in consumer sovereignty with an increasing progression of decision automation of consumption decision.

---

Markus Gerold is a scientific consultant and researcher with a background in sociology, socio-technological change and organizational studies. He studied sociology and political studies at the Ludwig-Maximilians-University Munich and social sciences at the Humboldt University Berlin. During his studies and after graduating from university, Markus Gerold worked as a User Experience researcher in the gaming industry. Later, he was employed as a researcher for the Deutsche Post Endowed Chair of Strategic Marketing at Steinbeis University, where he worked on training programs on digitalization and on research projects in the field of public engagement and education. He finished his dissertation in 2023.

ISBN 978-3-95663-302-7



[www.steinbeis-edition.de](http://www.steinbeis-edition.de)

 **Steinbeis-Edition**