
Forschungs-/Entwicklungs-/ Innovations-Management

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Die Reihe stellt aus integrierter Sicht von Betriebswirtschaft und Technik Arbeitsergebnisse auf den Gebieten Forschung, Entwicklung und Innovation vor. Die einzelnen Beiträge sollen dem wissenschaftlichen Fortschritt dienen und die Forderungen der Praxis auf Umsetzbarkeit erfüllen.

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Joining Decisions in Open Collaborative Innovation Communities

A Discrete Choice Study

 Springer Gabler

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Technische Universität Hamburg-Harburg
Hamburg, Germany

Dissertation Technische Universität Hamburg-Harburg 2013

ISBN 978-3-658-04063-5

ISBN 978-3-658-04064-2 (eBook)

DOI 10.1007/978-3-658-04064-2

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

Library of Congress Control Number: 2013952747

Springer Gabler

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Foreword

This study comes to the right time: More and more firms today widely realize the importance of exploiting different avenues to benefitting from technology and innovation. One of these avenues is Open Source Innovation, which allows firms to openly innovate, sourcing and exploiting ideas and technologies outside the boundaries of their own firm. For this purpose they need and are eager to learn how to successfully source relevant ideas for their innovations in `markets´ like open communities, and networks.

Still many questions remain unanswered: Why do users choose one innovation context over another? What are attractive conditions for user and distributed innovations? To give answer to these questions Daniel Ehls examines with a Discrete Choice approach: How do contextual factors influence self-selection of participants into an open organization? His approach does pioneer work in extending the methodological spectrum in open and user innovation research. His innovative and in-depth study reveals new insights and delivers important contributions. His data evaluation are exemplary, enriching, and very well comprehensible.

Daniel Ehls main analyses targets the favors of contextual factors. He discovers up to date unknown user preferences of openness and firm affiliation in joining communities. Also, he finds a relationship of individual user traits and joining decisions. He proofs empirically a contingency of individual's joining behavior and organizational preferences - a link so far challenging researchers and a key contribution. In addition, Daniel Ehls exposes significant user diversity and can for the first time compare member characteristics in open source types beyond software and content, namely fun and business communities. His delivered results are very sophisticated and are neither acknowledged nor empirically analyzed so far.

The results of his study are relevant to and support firms by a much better understanding of users´ preferences of joining in open collaborative communities. The results enable firms to optimize the design of their open innovation community-related activities. This study's contribution to the current debate must not the least be considered highly relevant because Daniel Ehls has integrated the micro level perspective of innovating firms with the market perspective. Concluding, this dissertation is highly relevant to both – academia and praxis: Comprehensive, interdisciplinary, and as such very well carried out, structured and readable.

Hamburg, September 2013

Univ. Prof. Dr. Cornelius Herstatt

Preface

This work is based on the studies I conducted at the Institute for Technology and Innovation Management (TIM) at the Hamburg University of Technology (TUHH) which finally led to my dissertation. My dissertation concentrates on research in the field of open and user innovation and provides fundamental insights into volunteering behavior contingent on institutional governance practices and distributed innovations. Specifically, in analyzing open collaborative innovation communities, I identify optimal settings to attract joiners and highlight their preferences in terms of openness and firm involvement. I make claims on openness preferences, trade-off decisions, user diversity, participation behavior, joiner decision involvement, participation lifecycle consideration, contingency models, and the heterogeneity of the project type landscape. I develop a novel community participation model that orders research, introduces a pre-participation phase and can guide future research. Also, I show that context and personality determine community joining decisions and how different governance structures affect user behavior. These contributions help to clarify the discussion of contextual preferences and favored working conditions. I resolve the dispute of seemingly divergent perspectives in research by proposing a new model that describes preferences on the individual specific level and accounts for joiner heterogeneity as well as applying a method considering confounded settings. Based on a linkage of individual joiner traits and social practices, I explain why specific users choose a work context over another but other users refrain from the same. Thus, I detail the role of individual behavior in joining decisions, bring coherence in the understanding of openness preferences, and move the conversation forward. Moreover, these findings help managers to design prolific work environments and stimulate innovations.

During my TIM time I enjoyed several privileges for which I owe deep gratitude; my work – and I – would not be the same without these.

Firstly, I would like to thank Prof. Cornelius Herstatt for being my Ph.D. advisor and for the confidence you have placed in me. You gave me freedom to work but also encouraged me with your open-minded and visionary thinking. I benefited from the inspiring discussions, teaching opportunities, and the chances to transfer my knowledge into both, academic conferences and managerial practice. I am furthermore impressed with the wonderful atmosphere you have created at the institute that made it a pleasure to work.

I also would like to particularly thank Prof. Christina Raasch for being a mentor during my research and go-to person. You guided my work in view of theory insights and scholarly working. I benefited tremendously from your helpful comments and how you pointed me to further fields of interest. Whenever I had a question, you had time and your answer stimulated further productive thinking.

Additionally I thank Prof. Wolfgang Kersten for chairing my doctoral defense and supporting a smooth organization of my examination. Also, the work would not have been possible without the rich discussions with members of the different open source communities and their willingness to participate in my research. I hope my results will help your communities to achieve prosperity and that you'll find attractive places to join.

I'll never forget the outstanding TIM team and colleagues. Whether for rigorous academic debates and exchanges, as well as for many memorable activities beyond academia, TIM was always there. Finally, I thank my friends for the critical debates and curiosity about the phenomenon, reviewing the manuscript, and especially for being there – even without much contact.

I would like to end this preface with an analogy for my family. This work analyzes decision making and highlights optimal opportunities for development. My beloved family – my mum, dad and sister – you have already created this optimal environment for me. Based on the fruitful field you have prepared, I was able to make my own decisions and go my way. You provided me with the necessary support, but also opened the view beyond my own nose. I cannot express adequately my gratitude for your energy. However, in deep tribute I dedicate this work to you and the optimal ground you have prepared for my development.

Hamburg, September 2013

Daniel Ehls

Contents

Abstract	XIII
Zusammenfassung	XIV
List of Figures	XV
List of Histograms.....	XV
List of Tables	XVI
List of Abbreviations	XVIII
1 Introduction	1
1.1 Research Motivation	1
1.2 Research Approach	2
1.3 Research Contributions.....	4
1.4 Thesis Outline.....	6
2 Open Source Innovation.....	7
2.1 Open Source Taxonomy	8
2.1.1 An Economic Perspective: Openness and Free Revealing.....	9
2.1.2 A Social Perspective: Collaboration and Movements	10
2.1.3 An Artifact Perspective: Terminology and Classification	12
2.1.4 Adopted Perspective in This Thesis: Definitions and Structure	15
2.2 Open Source Participants.....	17
2.2.1 Individual Participants: Traits and Participation Rationales	17
2.2.2 Collective of Participants: Community Context.....	23
2.3 Open Source Joining	31
2.3.1 Initial Participation and the Community Joining Script.....	32
2.3.2 Sustained Participation and Progressing Towards Center.....	33
2.3.3 Terminating Participation and Community Leaving.....	34
2.3.4 Developing a Contribution Framework	36
2.3.5 Pre-Participation and Community Awareness.....	38
2.3.6 Introducing the Participation Lifecycle Model.....	39
2.4 Chapter Conclusion	42
3 Theoretical Foundation.....	43
3.1 An Individual-motivation Perspective	43
3.2 A Network-exchange Perspective	44
3.3 An Innovation-incentive Perspective	47
3.3.1 The Private-Investment Model of Innovation	47
3.3.2 The Collective Action Model of Innovation.....	49

3.4	An Open Collaborative-innovation Perspective.....	50
3.5	Synthesis and Conclusion.....	52
4	Research Model and Hypotheses.....	54
4.1	Research Rationales	54
4.1.1	Communities as Strategic Assets for Firms	54
4.1.2	Increasing Competition Challenges Communities	55
4.1.3	Participants' Decision to Join Communities	57
4.1.4	Joining Decisions Depend on Contextual Factors.....	58
4.2	Research Objective and Subsequent Research Questions.....	59
4.3	Research Framework: Firm-User-Openness Tensions.....	61
4.3.1	Usage Regulations	62
4.3.2	Access Regulations	63
4.3.3	Openness as Multidimensional Concept.....	64
4.4	Research Model.....	64
4.5	Development of Hypotheses	66
4.5.1	Sponsorship Hypotheses	66
4.5.2	Access Hypotheses	72
4.5.3	Usage Hypotheses.....	75
4.6	Extending the Research Model with Causes of Preference Heterogeneity	78
4.6.1	Interrelationship Individual User Traits and Contextual Factors.....	78
4.6.2	Synthesis and Extending the Research Model	80
4.6.3	Considering Open Source Type Heterogeneity	81
4.7	Chapter Conclusion	86
5	Methodological Design and Empirical Approach.....	87
5.1	Discrete Choice Experiment Approach.....	88
5.1.1	Econometric-theoretical Foundation	88
5.1.2	Discrete Choice Experiment Application.....	89
5.2	Discrete Choice Experiment Design	91
5.2.1	Stimuli Refinement and Operationalization of Hypotheses	92
5.2.2	Determination of Stimulus Set Profile.....	95
5.2.3	Measurement of Preferences.....	100
5.3	Data Collection.....	103
5.3.1	Survey Development.....	103
5.3.2	Unit of Analysis and Targeted Communities for Data Sourcing.....	106
5.3.3	Data Sourcing and Resulted Sample	109

5.3.4	Data Preparation	113
5.3.5	Psychometric Data Evaluation.....	116
5.4	Data Analysis	118
5.4.1	Selection of Estimation Model.....	118
5.4.2	Econometric Choice Model Specification	120
5.5	Chapter Conclusion	124
6	Empirical Evidence and Measurement Results	125
6.1	Descriptive Statistics.....	125
6.2	Inferential Statistics.....	127
6.2.1	Group Differences of Descriptive Parameters.....	127
6.2.2	Choice Based Results.....	130
6.3	Explorative Statistics	136
6.4	Chapter Conclusion	140
7	Interpretation and Discussion of Empirical Measures	141
7.1	RQ1: Why Is One Community Preferred Over Another?	142
7.1.1	Hypotheses Testing	142
7.1.2	Parameter Importance and Choice Share Predictions	144
7.1.3	Sensitivity Analysis of Choice Probabilities	147
7.1.4	Status Quo Elucidation.....	149
7.1.5	Closing and Answering the Research Question	150
7.2	RQ2: What Are the Causes of Preference Heterogeneity?	151
7.2.1	Proposition Evaluation	151
7.2.2	Exposition of Heterogeneity and Explaining Relationships.....	154
7.2.3	Closing and Answering the Research Question	157
7.3	RQ3: What Are the Differences Between Open Source Project Types?	158
7.3.1	Proposition Evaluation	158
7.3.2	Exposing Heterogeneity of Participants	160
7.3.3	Combining Community Heterogeneity with Choice Results	166
7.3.4	Closing and Answering the Research Question	167
7.4	RQ4: What Additional Factors Drive Actual Community Joining Decisions?	168
7.4.1	Reflecting the Discrete Choice Experiment and Testing Technical Adequacy .	168
7.4.2	Testing Experiment versus Real World Choices.....	169
7.4.3	Exposing Choice Differences with Effectiveness Factors	170
7.4.4	Exposing Choice Differences with an Explorative Analysis.....	172
7.4.5	Combining Explorative Analysis, Effectiveness Factors and Preferences.....	173

7.4.6	Closing and Answering the Research Question	174
7.5	RQ5: How Intensively Do Members Reflect On Their Joining Decision?	175
7.5.1	Exposing Users' Reflection of a Community Choice	175
7.5.2	Closing and Answering the Research Question	177
7.6	Chapter Conclusion	178
8	Contributions and Implications.....	179
8.1	Contributions to Theory	179
8.1.1	Implications for Joining and Individual Behavior	179
8.1.2	Implications for the Organizational Model and Innovation Process	182
8.1.3	Implications for Strategy and Competitive Dynamics	183
8.1.4	Implications for Private-Collective Innovation	186
8.2	Methodological Contributions and Measurement Implications	187
8.3	Recommendations for Management Practice	189
8.4	Limitations.....	193
8.5	Directions for Future Research	195
8.6	Chapter Conclusion	198
9	Conclusion.....	199
	References.....	200
	Appendix	225
A.	Questionnaire.....	225
B.	Statistical Analysis	234

Abstract

Why do users join one innovation context over another? What are attractive conditions for user and distributed innovations? Interest in user and distributed innovation has increased considerably within the last few years. Users volunteer in open communities outside the boundaries of the firm and collaboratively develop innovative products, challenging incumbent firms and traditional organizational behavior. However, communities collapse without members. Growing competition among communities for users and increasing user diversity (e.g. firm participation) has resulted in a challenge in attracting users. Currently, factors impacting on the attraction of participants into communities are blurred, preferences are unclear, and reasons for choosing one particular setting over another are unidentified.

I target this realm of individual characteristics, competing opportunities, and institutional arrangements and examine the question: 'How do contextual factors influence the joining decisions of participants into open communities?' More specifically, I aim at analyzing users' preferences and trade-offs when joining an open collaborative community.

This research is grounded on private-collective innovation theory and combines aspects of economics and psychology in order to understand complex social interactions. A primary data sample with 1480 observations by 185 users of business, fun, software, and content communities forms the basis for empirical examination with a discrete choice experiment. The analysis of preferences applies a mixed logit model incorporating panel and confounding effects, as well as analyzing individual user characteristics as causes for taste heterogeneity.

I reveal community choice preferences contingent on contextual factors of access, usage, and sponsorship. These contextual factors are favored differently by prospective joiners and the differences are illustrated in what-if scenarios enabling prediction of quantifiable *ceteris paribus* joining probabilities. The causes of taste heterogeneity are explored and individual user traits exposed as antecedents for why choice differences exist. Thus, I find a linkage of personality to contextual factors, can explain decisions for joining one community over another and how governance changes affect user behavior. These insights also resolve the dispute of seemingly divergent perspectives in research by proposing a new model describing preferences not on a general but on an individual level. Going beyond openness and organizational involvement criteria, the strongest impact on community joining decisions exhibits the produced goods and the community member behavior. Conceptually, I develop a user lifecycle framework, providing guidance for community participation and progression. In conclusion, I not only challenge the state of the art in innovation research with a new methodological approach, but also with an extended phenomenological scope and novel abstractions in open collaborative institutional settings. Hitherto isolated research areas of organizational settings, individual behavior, and competitive dynamics are combined and new relationships identified. On this basis, I derive implications for theory and managerial practice. In particular, suggestions for competitive strategy and organizational behavior are formulated in order to reduce management headaches but also support the organization in technology development, fostering collaboration of inventors, and stimulate innovation.

Zusammenfassung

Warum bevorzugen User einen Innovationskontext vor einem anderen? Was sind attraktive Bedingungen für die Teilnahme an offenen und verteilten Innovationsprojekten? Die Anzahl offener und verteilter Innovationsprojekte hat in den letzten Jahren phänomenal zugenommen. Volunteers entwickeln gemeinschaftlich neue Produkte in offenen Gruppen, welche etablierte Firmen und Organisationsverhalten herausfordern, jedoch gleichzeitig verschiedenartige Kundenbedürfnisse befriedigen. Die Sicherung der Beitragsleistung und Nutzung von verteiltem Wissen wird jedoch durch steigenden Wettbewerb um Nutzer zwischen Communities gefährdet. Es bieten sich Alternativen für den Nutzer, der dadurch Auswahlentscheidungen und Abwägungen (Trade-offs) trifft. Zentrale Aspekte sind dabei ein angemessener Grad von Offenheit der Zugangsberechtigung und Produktnutzung, sowie der Firmenbeteiligung. Die Präferenzen und Abwägungen eines Users sind jedoch unklar.

Diese Arbeit erforscht das Entscheidungsverhalten von Usern zum Beitritt in offene Communities und klärt die Frage: Wie wirken sich kontextuelle Faktoren auf die Selbstselektionsentscheidung in offen Kollaborationen aus? Es werden kausale Beziehungen der Präferenzheterogenität abgeleitet sowie Abwägungsentscheidungen zwischen Alternativen quantifiziert. Die Arbeit basiert dabei auf der "Private-Collective Innovation" Theorie und kombiniert wirtschaftliche und psychologische Aspekte um soziale Interaktionen zu verstehen. Eine Primärdatenstichprobe von 1480 Beobachtungen von 185 Usern aus den Communitybereichen Geschäftlich, Entertainment, Software und Kontent bildet die Basis für die Analyse mittels eines diskreten Auswahl-experiments. Die ökonometrische Auswertung mittels eines Mixed Logit Models berücksichtigt 'Confounding', Diversitäts-, und Panel Effekte. Die Erkenntnisse dieser Arbeit sind vielfältig. Bisher unbekannte Beitrittspräferenzen in Abhängigkeit von Offenheit und Firmenbeteiligung werden gefunden und Szenarien mit dedizierten Auswahlwahrscheinlichkeiten für verschiedene Faktorkombinationen dargelegt. Die heterogenen Beitrittspräferenzen können dabei durch individuelle Usercharakteristika erklärt werden. Es wird somit ein Zusammenhang von individuellem Verhalten und Organisationspräferenz aufgedeckt, der die bestehende Forschungsdiskussion auf ein individuelles Level bringt und vorherige scheinbar konträre Ergebnisse vereint. Konzeptionell wird ein Model des Partizipationslebenszyklus von Usern entwickelt, das Mitgliedschaftsstufen und die Sozialisierung innerhalb der Community darlegt. Die Arbeit vergrößert somit nicht nur das Methodenspektrum, sondern verstärkt den phänomenologischen Bereich durch eine Open Source Typ übergreifende Betrachtung. Implikationen für die Theorie sind das größere Verständnis und die Integration der bisher getrennten Forschungsschwerpunkte individuelles Verhalten, konkurrierende Wahlmöglichkeiten und institutionelle Abhängigkeiten in offenen und verteilten Gruppen. Empfehlungen für die Praxis zielen auf das strategische Organisations-Engineering sowie das Verständnis für die Mitgliederpartizipation in Organisationsformen spezifisch für heterogene Teilnahmeerwartungen. Ebenso werden weitere Forschungsmöglichkeiten vorgeschlagen um das Verständnis von Innovationsorganisation sowie Kooperationsverhalten weiter aufzuklären.

List of Figures

Figure 1: Thesis Outline 6

Figure 2: Truth and Value Category Assessment for Digital Open Source Projects.....13

Figure 3: Open Source Software, Content, and Hardware Differentiation.....16

Figure 4: Contribution Framework of Open Source Projects.....37

Figure 5: Participation Lifecycle Model40

Figure 6: Social Exchange Process45

Figure 7: Basic Research Model Analyzing Joining Contingent on Contextual Factors.....65

Figure 8: Extended Research Model Explaining Sources of Preference Heterogeneity80

Figure 9: Design Guideline of Discrete Choice Experiment Development.....91

Figure 10: Operationalization of Variables95

Figure 11: First Survey Page of the Preference Measurement with Developed Stimuli101

Figure 12: Deviations of Stated versus Revealed Community Choices.....170

List of Histograms

Histogram 1: Software Content Comparison of Participation Rationales.....84

Histogram 2: Ramp-up Curve of Applied Categories in Explorative Analysis139

Histogram 3: Overview Share of Preference Prediction (Reference: Lowest Reference)146

Histogram 4: Overview Share of Preference Prediction (Reference: Highest Reference)147

Histogram 5: Distribution of 'Sex' Heterogeneity.....160

Histogram 6: Distribution of 'Age' Heterogeneity161

Histogram 7: Distribution of 'Work Situation' Heterogeneity161

Histogram 8: Distribution of 'Educational' Heterogeneity162

Histogram 9: Distribution of 'Knowledge Proficiency' Heterogeneity162

Histogram 10: Distribution of 'Participation Hours (Reading)' Heterogeneity163

Histogram 11: Distribution of 'Participation Hours (Writing)' Heterogeneity164

Histogram 12: Distribution of 'Participation Hours (Moderating)' Heterogeneity164

Histogram 13: Distribution of 'Tenure' Heterogeneity165

Histogram 14: Distribution of 'Participation Rationales' Heterogeneity166

Histogram 15: Community Choice Influence Factors Beyond Openness (i).....171

Histogram 16: Community Choice Influence Factors Beyond Openness (ii).....172

Histogram 17: Distribution of Community Reflection Indicators176

List of Tables

Table 1: Overview Participation Rationales in Open Source Software Communities	20
Table 2: Overview Participation Rationales in Open Content Communities	21
Table 3: Typology of Online Communities of Practice.....	24
Table 4: Overview of Success Antecedents in Attracting Community Participants.....	30
Table 5: Comparison of Models of Innovation.....	51
Table 6: Research Questions Guiding This Thesis	60
Table 7: Participation Trade-offs for For-profit Sponsors and for Users.....	71
Table 8: Stimuli Sets Resulting of Discrete Choice Experiment Design	99
Table 9: Operationalization of Psychometric Constructs of Participation Rationales	105
Table 10: Sampled Open Source Content Communities and Their Contextual Factors	107
Table 11: Sampled Open Source Software Communities and Their Contextual Factors	108
Table 12: Overview of Survey Return Rates Per Community	110
Table 13: Dissemination of Demographic Factors of Sampled Population.....	112
Table 14: Data Preparation Framework for Consistency, Completeness, and Plausibility	115
Table 15: Scores of Internal Consistency Checks of Psychometric Constructs	116
Table 16: Scores of Construct Structure Checks of Psychometric Constructs.....	117
Table 17: Applied Discrete Choice Model Specifications.....	124
Table 18: Descriptive Statistics of Sampled Variables	126
Table 19: Inferential Statistics of Software versus Content Differentiation Tests	128
Table 20: Inferential Statistics of Fun versus Business Differentiation Tests.....	129
Table 21: Inferential Statistics of Participation Rationales Differentiation Tests.....	130
Table 22: Correlated-panel MXL Model Estimation Output	131
Table 23: Overview of Sources of Preference Heterogeneity (Single Variable - i)	133
Table 24: Overview of Sources of Preference Heterogeneity (Single Variable - ii).....	133
Table 25: Correlated-panel MXL Model Estimation Output with Payment Heterogeneity	134
Table 26: Overview of Sources of Preference Heterogeneity (Multiple Variable - i).....	135
Table 27: Overview of Sources of Preference Heterogeneity (Multiple Variable - ii)	136
Table 28: Applied Tags and Categories for Explorative Analysis	137
Table 29: Distribution of Applied Tags in Explorative Analysis.....	138
Table 30: Preference Structure of Contextual Factors	143
Table 31: Change of Selection Probability Caused by Altering Community Affiliation	148
Table 32: Change of Selection Probability Caused by Altering Community Access	148
Table 33: Change of Selection Probability Caused by Altering Community Usage.....	148
Table 34: Overview of Hypotheses Testing Regarding Overall Community Preference.....	150

Table 35: Superimposed Results of Sources of Preference Heterogeneity (i).....	152
Table 36: Superimposed Results of Sources of Preference Heterogeneity (ii).....	153
Table 37: Overview of Proposition Evaluation Regarding Sources of Preference Variation..	157
Table 38: Differences between Open Source Project Types	159
Table 39: Overview of Proposition Evaluation Regarding Open Source Type Diversity	167

List of Abbreviations

Content-specific Abbreviations

APD	Average decision involvement
BSD	Berkeley Software Distribution
CoP	Communities of practice
Com. Aff.	Commercial affiliation
DCE	Discrete choice experiment
GPL	General Public License
IPR	Intellectual property rights
MNL	Multinomial Logit model
MXL	Mixed Logit Model
NGO Aff.	Non-Governmental Organizational affiliation
No Aff.	No organizational affiliation
OCI	Open collaborative innovation
OS	Open source
OSC	Open source content
OSS	Open source software
RA	Restricted access
RO	Read-only access
RW	Read-write access
RUT	Random Utility Theory
RQ	Research Question
STD	Self-determination theory

Statistical Abbreviations

df	Degrees of freedom
LL	Log-likelihood function
p	p-value
n	Number of observations
R ²	Coefficient of determination

General Abbreviations

e.g.	for example (<i>exempli gratia</i>)
et al.	and others (<i>et alii</i>)