

INNOVATION IN COMPLEX SYSTEMS

An exploration in strategy, leadership and
organization

Christer Vindeløv-Lidzélius

Promotores:

Prof. dr. J.B. Rijsman

Prof. dr.ir. G.M. van Dijk

Promotiecommissie:

Prof. dr. E.J.P. van Loon

Prof. dr. E. Schwella

Prof. dr. A. Drejer

Dr. S. Grieten

Preamble

Dear Reader

In this preamble, I would like to give you an advance narrative summary of my thesis, its topic, its importance and how I went about it. This is because there is a strong emergent character in my work – I finish every chapter with emerging questions – and for some it might be too much to wait until the end to see the line. In fact, I had no closed theory nor a predetermined hypothesis to begin with, only an open question, a need to understand. Being trained in the social sciences, I knew that clarifying the question is as much a part of the research as providing answers. My curiosity, simply stated, is about the discourse and reality of innovation in business: why is something that seems so important to our daily life so poorly understood and so undefined in terms of implementation.

That innovation is a timely topic goes without saying. One can hardly find these days a description of a company, an annual report or a strategy document, without an explicit statement of the need for innovation, let alone one in which the need for innovation would be explicitly denied. We find a total commitment to innovation, a stated aspiration to take it further and further. The typical logic of justification is that companies that do not innovate – that do not offer new products and services to their clients – will sooner or later become obsolete and give the upper hand to their competitors. Although this a logic may not be entirely new in business, it is taken together nowadays under the single umbrella of the need for innovation, not only in business, but also in society as a whole and even in our personal lives.

In my role as a consultant for more than two decades I have witnessed and participated in the growing attention for innovation, not only in real terms, but also and above all in discourse. There seems to have grown an unstoppable desire for something “new”. The ready-made reply to that desire invariably became “innovation”. However, alongside the growing attention on innovation, there also grew a parallel awareness of how little we actually know about it, and even less about what to do to make it work. This stands in sharp contrast, for example, with another discourse that started at about the same time, namely Quality Management, for which there soon appeared a common language, a set of definitions and even concrete measurement tools. This is definitely not the case for innovation and I wanted to know more about this. I therefore formulated a concrete question, “How do organizations go about developing capacity for bringing about innovation in complex systems”, and decided to approach it through a variety of methods, namely: 1) Literature research, 2) A quantitative survey of a relatively large group of stakeholders, 3) An action research process, 4) Two sets of in-depth interviews, and 5) A focus group study.

The first approach, literature research, explores the concept of innovation quite broadly, whereas the field work is narrower, situated around a specific company and a specific department in that company. The survey is less narrow and serves as basis of comparison for that company.

Given the multifaceted character of innovation, as well as the apparent multitude of understandings, it seemed reasonable to choose “complexity” and “social constructionism” as “world-views” on the subject. “Complexity” because it is obvious that the business world, including innovation, does not behave in a simple predictable way, both backward and forward, like in classical mechanics, but more in a non-linear or less predictable way, like in complex systems. But since it is probably a bit haphazard to simply transfer a concept from the natural sciences

to the social sciences, I decided also to search for a more or less parallel notion in the social sciences; this was “social constructionism”. By looking at innovation through the lens of these two notions, it became clear that it could be conceived as a complex adaptive system in itself, nested within a larger complex adaptive system, and that we could actually propose a new definition of innovation that reflects the similarities between the two world-views.

The literature research is given in chapter 2. In chapter 3 I explain the methodology, arguing mainly for authenticity and transparency, or the social constructionist equivalents of validity and reliability. In chapter 4, I present and analyse the empirical findings, in simple descriptive terms and avoiding inferential statistics, because this was not our intention. In chapter 5, we bring the quantitative and qualitative data together and discuss them through parameters of more nuanced questions that had emerged along the way. In chapter 6, we come to conclusions, discuss our main findings (i.e., around a new form of R&D, around capacity building for innovation, around the current state of innovation, and around the conceptual integration of social constructionism, complexity and innovation), and try to bring them back to our original research question.

To clarify, I had one in-depth case study, and one could argue that its in-depth side was only focused on one department. In terms of findings and conclusions I cannot therefore speak on behalf of all organizations. However, many of the findings in the case study resonated well with those from the quantitative study and were echoed in the literature review. As such, there is enough around the findings to allow for speaking more generally in the conclusions – hence my frequent use of the plural organizations, as opposed to organization.

The whole thesis has been deliberately written in the same style as the nature of the research itself, namely reflective and participatory, explorative, gradually unfolding, generating new questions along the way, and provoking assumptions and findings. The journey I embarked on was, indeed, not to prove or disprove a definite hypothesis, not to affirm or reject a closed theory, but to learn from doing and reflecting in a world I wanted to understand better, namely the world of innovation, and more particularly how strategies for innovation are developed and implemented, if at all. It has been a journey of reflective practice in which I learnt through simply doing, as hopefully you will too.

Christer Windeløv-Lidzélius

Table of contents

Preamble	v
Summary	vii
Table of contents	x
List of tables	xv
List of figures	xvii
1 Introduction	1
1.1 Background to the study	1
1.2 Innovation	2
1.3 Author’s preconceptions and starting point.....	3
1.4 The empirical material.....	4
1.5 The problem statement.....	4
1.6 The purpose statement	5
1.7 Research questions	5
1.8 Overview of methodology	5
1.9 Limitations of the study and approach.....	6
1.10 Definition of key terminology	6
1.11 Organization of the dissertation	7
2 Literature review	9
2.1 Introduction to chapter 2	9
2.2 Methodology for literature research.....	9
2.3 Innovation	10
2.3.1 What is innovation?	11
2.3.1.1 The history of the idea of innovation.....	11
2.3.1.2 Categorization of innovation	16
2.3.1.3 Innovation models.....	24
2.3.1.4 Measurement of innovation.....	34
2.3.1.5 Definitions of innovation.....	36
2.3.1.6 Summary of section 2.3.1	41
2.3.2 The business of innovation.....	42
2.3.2.1 The purpose of innovation.....	42
2.3.2.2 On the matter of change.....	45
2.3.2.3 Leading innovation and innovation leadership tools.....	48
2.3.2.4 Globalization and innovation	52
2.3.2.5 New business models and approaches for innovation.....	53
2.3.2.6 Summary of section 2.3.2	54
2.3.3 Creating innovative organizations	55
2.3.3.1 Innovation management.....	55
2.3.3.2 Innovation processes.....	56
2.3.3.3 Creativity and ideation	57
2.3.3.4 Organizational culture.....	60
2.3.3.5 Creating space for innovation.....	63
2.3.3.6 Summary of section 2.3.3	65

2.3.4	Emerging questions following section 2.3	66
2.4	Complex systems	67
2.4.1	Chaos theory	68
2.4.2	Systems.....	69
2.4.3	Complexity theory.....	69
2.4.4	Complex systems.....	71
2.4.5	Complex adaptive systems.....	73
2.4.6	Summary of section 2.4.....	76
2.4.7	Emerging questions following section 2.4	77
2.5	Social constructionism	77
2.5.1	What is social constructionism?.....	77
2.5.2	Criticism.....	79
2.5.3	Relationships and meaning.....	79
2.5.4	Summary of section 2.5.....	81
2.5.6	Emerging questions following section 2.5	82
2.6	Innovation, complex systems and social constructionism	83
2.6.1	Complexity and innovation	83
2.6.1.1	Systems thinking and innovation	83
2.6.1.2	Complex adaptive systems and innovation	85
2.6.1.3	Complex responsive processes and innovation.....	87
2.6.1.4	Cynefin and innovation.....	90
2.6.2	Complexity and social constructionism.....	91
2.6.3	Innovation, complexity and social constructionism	92
2.6.4	Summary of section 2.6.....	93
2.6.5	Emerging questions following section 2.6	94
2.7	Summary of chapter 2	95
2.8	Emerging questions following chapter 2.....	97
3	Methodology.....	99
3.1	Introduction to chapter 3	99
3.2	Note on the starting point of the research and methodology	99
3.3	Note on the relationship between the case and the researcher	100
3.4	Overview of the research design and methodology	101
3.5	Overview of the research process.....	102
3.6	The research process explained.....	103
3.7	Theory of science	104
3.8	Research design and methodology	105
3.8.1	Problem formulation	105
3.8.2	Social constructionism and methodology	106
3.8.3	Grounded theory.....	106
3.8.4	Mixed methods.....	107
3.8.5	Single case design	108
3.8.6	Source selection, validity and methodology.....	109
3.8.7	Triangulation.....	109
3.8.8	Choice of sources	110
3.8.9	Validity, reliability and generalizability.....	110
3.8.10	Transparency and authenticity	111
3.8.11	Strategy and methodology for the analysis.....	112
3.8.12	Condensation, coding and interpretation.....	114
3.8.13	Lenses for the analysis in the convergence phase.....	115
3.9	Data collection	116
3.9.1	Description of the qualitative research – action research.....	116

3.9.1.1	Methodological considerations.....	116
3.9.1.2	Background.....	120
3.9.1.3	Purpose.....	120
3.9.1.4	Design of the process.....	120
3.9.1.5	Participants.....	122
3.9.1.6	Design of workshops.....	122
3.9.1.7	Feedback, de-brief and co-creation.....	123
3.9.2	Description of the quantitative research.....	125
3.9.2.1	Methodological considerations.....	125
3.9.2.2	Aim.....	127
3.9.2.3	Questionnaire design.....	127
3.9.2.4	Platform.....	129
3.9.2.5	Timeframe.....	129
3.9.2.6	Online forums.....	129
3.9.2.7	Number of respondents.....	130
3.9.2.8	Categorization of responses from the quantitative research.....	130
3.9.2.9	Analysis.....	130
3.9.2.10	Development of the case towards the qualitative research.....	131
3.9.3	Description of the qualitative research – interviews.....	131
3.9.3.1	Methodological considerations.....	131
3.9.3.2	Preparation for data collection.....	132
3.9.3.3	Selection of interviewees.....	133
3.9.3.4	Interviews and interview guide.....	133
3.9.4	Description of the qualitative research – focus group.....	136
3.9.4.1	Methodological considerations.....	136
3.9.4.2	Identification and selection of the participants.....	137
3.9.4.3	Preparation for data collection (the workshop).....	137
3.9.4.4	Process – intention, set-up and approach.....	138
3.9.4.5	Considerations concerning outcome.....	139
3.10	Telefónica review.....	139
3.11	Summary of chapter 3.....	139
3.12	Emerging questions following chapter 3.....	140
4	Empirical findings and analysis.....	143
4.1	Introduction to chapter 4.....	143
4.2	Case presentation and analysis.....	143
4.2.1	Facts and figures.....	143
4.2.2	Strategy.....	144
4.2.3	Innovation.....	145
4.2.4	Telefónica I+D.....	146
4.2.5	Open Futures.....	147
4.2.6	Alpha.....	147
4.2.7	Changes 2013–2016.....	148
4.2.8	Innovation thinking and methodology.....	149
4.3	The quantitative survey.....	151
4.3.1	The findings from the fixed responses.....	151
4.3.1.1	Understanding the respondents.....	151
4.3.1.2	The competitive business environment.....	152
4.3.1.3	Innovation as a priority.....	154
4.3.1.4	Innovation models.....	156
4.3.1.5	Sources for innovation strategies.....	158
4.3.1.6	Importance of innovation goals.....	160
4.3.1.7	Assessment of aspects of innovation.....	163
4.3.1.8	Responsibility for innovation.....	165
4.3.1.9	Assessment of innovation strategy development.....	167

4.3.1.10	Assessment of innovation methodologies.....	169
4.3.1.11	Findings from the open-ended responses	171
4.3.2	The findings – comparing the case with industry and all responses.....	176
4.3.3	Emerging views following section 4.3	182
4.3.4	Remarks on section 4.3	183
4.4	The action research.....	184
4.4.1	Findings	184
4.4.1.1	Prelude sessions.....	184
4.4.1.2	Workshop I (March 14 th , 2013).....	185
4.4.1.3	Workshop II (April 24 th , 2013).....	186
4.4.1.4	Workshop III (June 26 th , 2013).....	187
4.4.1.5	Workshop IV (September 30 th , 2013).....	189
4.4.1.6	Workshop V (November 25 th , 2013).....	190
4.4.1.7	Workshop VI (February 20 th , 2014 and June 24 th , 2014).....	192
4.4.2	Emerging views following section 4.4	193
4.4.3	Remarks on section 4.4, the action research.....	195
4.5	The interviews part I.....	195
4.5.1	Thematic analyses.....	195
4.5.2	Emerging views following section 4.5	200
4.5.3	Remarks on section 4.5, the interviews part I.....	201
4.6	The interviews, part II.....	202
4.6.1	Thematic analyses.....	202
4.6.2	Emerging views following section 4.6	206
4.6.4	Remarks on section 4.6, the interviews part II.....	207
4.7	Focus group	208
4.7.1	Thematic analyses.....	208
4.7.2	Emerging views following section 4.7	213
4.7.3	Remarks on section 4.7, the focus group	214
4.8	Summary of chapter 4	215
4.9	Emerging questions following chapter 4.....	217
5	Discussion	218
5.1	Introduction to chapter 5	218
5.2	The lenses	219
5.3	Applying the lenses to the findings.....	221
5.3.1	Notion of innovation.....	221
5.3.2	Success	222
5.3.3	Frameworks, methods and tools.....	225
5.3.4	Notions of leadership	227
5.3.5	Notions of organization.....	229
5.3.6	Notions of strategy.....	230
5.3.7	Complexity theory and innovation.....	232
5.3.8	Social constructionism and innovation.....	234
5.4	A discussion of Alpha.....	237
5.4.1	Moonshots – beyond radical innovation.....	237
5.4.2	Alpha	238
5.4.3	The bigger picture	239
5.5	Summary of chapter 5	241
5.6	Emerging questions following chapter 5.....	241
6	Conclusion	243
6.1	Introduction to chapter 6	243
6.2	A recap of the research done	243

6.3	Research design and methodology	244
6.4	Applying the findings to the research question – general	245
6.5	Applying the findings to the research question – the specific main findings	248
6.5.1	Complexity, social constructionism and innovation.....	249
6.5.2	Findings around the state of innovation.....	249
6.5.3	Capacity building for organizations.....	250
6.5.4	A new form of R&D	251
6.6	Recommendations for future research.....	252
6.7	Limitations	253
6.8	Summary and closing words on chapter 6	253
6.9	Emerging questions following chapter 6	254
7	Reflections on my own journey	257
8	References.....	261
9	Appendices	287
9.1	The quantitative survey – the questions	287
9.2	Telefónica business presentation.....	296
9.3	Telefónica consultant (action-research) contract	304
9.4	Example of a report from a workshop during the action-research phase.....	306
9.5	Invitation letter to SMEs for the survey	321
9.6	List of interviewees 2013.....	322
9.7	List of interviewees 2017.....	323
9.8	Interview guide 2013.....	324
9.9	List of participants in the focus group.....	326
9.10	Introduction paper to the focus group.....	327
9.11	I DO ART.....	331
9.12	Respondents’ information and analysis – quantitative survey.....	332