# Shifting Practices

## Reflections on Technology, Practice, and Innovation

Giovan Francesco Lanzara

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

# Shifting Practices

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

**Acting with Technology**

Bonnie Nardi, Victor Kaptelinin, and Kirsten Foot, editors

*Tracing Genres through Organizations: A Sociocultural Approach to Information Design*, Clay Spinuzzi, 2003

*Activity-Centered Design: An Ecological Approach to Designing Smart Tools and Usable Systems*, Geri Gay and Helene Hembrooke, 2004

*The Semiotic Engineering of Human Computer Interaction*, Clarisse Sieckenius de Souza, 2005

*Group Cognition: Computer Support for Building Collaborative Knowledge*, Gerry Stahl, 2006

*Acting with Technology: Activity Theory and Interaction Design*, Victor Kaptelinin and Bonnie A. Nardi, 2006

*Web Campaigning*, Kirsten A. Foot and Steven M. Schneider, 2006

*Scientific Collaboration on the Internet*, Gary M. Olson, Ann Zimmerman, and Nathan Bos, editors, 2008

*Acting with Technology: Activity Theory and Interaction Design*, Victor Kaptelinin and Bonnie A. Nardi, 2009

*Digitally Enabled Social Change: Online and Offline Activism in the Age of the Internet,* Jennifer Earl and Katrina Kimport, 2011

*Invisible Users: Youth in the Internet Cafés of Urban Ghana*, Jenna Burrell, 2012

*Venture Labor: Work and the Burden of Risk in Innovative Industries*, Gina Neff, 2012

*Car Crashes without Cars: Lessons about Simulation Technology and Organizational Change from Automotive Design*, Paul M. Leonardi, 2012

*Coding Places: Software Practice in a South American City*, Yuri Takhteyev, 2012

*Technology Choices: Why Occupations Differ in Their Embrace of New Technology*, Diane E. Bailey and Paul M. Leonardi, 2015

*Shifting Practices: Reflections on Technology, Practice, and Innovation*, Giovan Francesco Lanzara, 2016

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

# Shifting Practices

## Reflections on Technology, Practice, and Innovation

Giovan Francesco Lanzara

The MIT Press
Cambridge, Massachusetts
London, England

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

© 2016 Massachusetts Institute of Technology

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher.

This book was set in Stone Sans and Stone Serif by Toppan Best-set Premedia Limited. Printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Names: Lanzara, Giovan Francesco, 1946– author.
Title: Shifting practices : reflections on technology, practice, and innovation / Giovan Francesco Lanzara.
Description: Cambridge, MA : The MIT Press, [2016] | Series: Acting with technology | Includes bibliographical references and index.
Identifiers: LCCN 2015039705 | ISBN 9780262034456 (hardcover : alk. paper)
Subjects: LCSH: Technological innovations—Case studies. | Technology—Social aspects—Case studies. | Music—Instruction and study—Data processing. | Computer music. | Video tapes in courtroom proceedings.
Classification: LCC T14.5 .L35 2016 | DDC 338/.064—dc23 LC record available at http://lccn.loc.gov/2015039705

10 9 8 7 6 5 4 3 2 1

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

To the memory of Donald Alan Schön

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

# Contents

Acknowledgments xi

**Prologue: On Negative Capability 1**

**I Studying Innovation as a Phenomenon 13**

1 Innovation in Practice: A Contrasted Dynamics 13
2 Processes of Design: Discontinuities, Bricolage, and Drifting 19
3 Practice and Method: A View from the Swamp 21
4 The Path in the Woods 24
5 Studying a Process of Innovation as It Happens in Practice 28
6 Designing a Reflective Inquiry 34
7 First-Order and Second-Order Inquiries 38
8 Backtalk and Conversations 41
9 On Unremarkability 45
10 Theoretical Narratives 50

**II Making Music in the Digital Medium: A Reflective Inquiry into the Design of a Computer Music System for Music Education 55**

**Introduction 57**

**1 Tracking the Design Process 59**

1 Entering the Stage: The Computer Music Project and Its Antecedents 59
2 The Early Design Problem: Upgrading the System 61
3 Designing the Computer Music Interface 64
4 Aspects of Designing: “Entry Points” and “For Instances” 73
5 Bridging Different Worlds: Two Experiments in Self-Observation 77
6 Knowing in Terms of What One Already Knows 85

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

7 Learning to Make Music in the Digital Medium 87
8 The Emerging Educational Environment: New Objects, Descriptions, and Activities 91

**2 The Music Faculty's Test of the System 95**
1 The System's Demo 95
2 The Music Faculty's Responses 97
3 Engaging the System as a Teaching Tool and as a Medium for Composition 98
4 Making Music: Composition or Programming? 104
5 Integrating the System into the Music Curriculum 108
6 Music LOGO as a Reflective Tool 112

**3 Revisitations: Shifting Stories 117**
1 The Backtalk and the Generation of Further Stories 117
2 A Further Round of Backtalk: The Demo as Cooptation 125
3 Accounting for the Shift: Toward a Second-Order Inquiry 128
4 Nature and Consequences of the Reflective Move 131
5 Evolving Understandings of the Design Process 133
6 Concluding Remarks: Telling a Story of Shifting Stories 137

**III Encountering Video Technology in Judicial Practice: Experiments and Inquiries in the Courtroom 141**

**Introduction 143**

**4 Entering the Temple of Justice 145**
1 The Courtroom and the Criminal Trial 145
2 The VCR System and the Courtroom: Research Setting and Method 147
3 Intervention: The Observer as Enabler 148

**5 Experimenting with Video Technology in the Courtroom 151**
1 Hosting a Stranger: Displacement and Redesign 151
2 Early Encounters with the New Tool: Virtual Replicas, Courtroom Contingencies, and Microinterventions 152
3 Design Probes: Seeing … Making … Seeing … 158
4 Learning to Use Videos in Judicial Decision Making 160
5 Nonverbal Behavior and the Legal Relevance of Visual Cues 169

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

**6 The VCR and the Back Office: Building "Equipmentality" 175**

1 Turning the Videotape into an Administrative Object 175
2 Redesigning Microprocedures 179
3 The Magistrates' Working Habits and the Private/Public Use of the VCR 183

**7 Reshaping Judicial Practice 185**

1 Engaging with the Medium 186
2 Questioning the Grounds of Practical Knowledge 188
3 Reweaving the Fabric of the Practice 192

**IV Further Inquiries into Shifting Practices 195**

1 Two Worlds of Practice: So Distant, and Yet not Quite so Distant 195
2 Practices and Media 198
3 Making Sense of the Practice in the New Media 207
4 The Medium-Object-Representation Triad: A Digression on Mark Rothko's Color Field Painting 213
5 Transient Knowledge 217
6 Aspects of the Practice of Innovation 234

**Epilogue: Reflections on Work Past 253**

1 "A Very Difficult Game Indeed" 253
2 Between Empathy and Reflexivity 257
3 How Is Self-Observation Empirically Possible? 259
4 Reflective Experiments 262

References 267
Index 279

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

## Acknowledgments

This book is the outcome of multiple waves of research over the course of many years—each subsequent wave bringing up new problems and new ways of looking at those problems, different interpretations of the data, new conceptual developments, and new stages of reflection, only to be changed by the wave that would come next. Hence time has been an important contributor to this book. Materials have been incessantly reworked, over and over again, like pebbles on a shore. In a sense, there has been a great deal of waiting on my part so that this book could come to being and take the present form. Over the years, traces, or footprints, providing hints of the character and direction of my inquiries have been left in several papers delivered at conferences, workshops, and in a limited number of published articles.* In this book the materials have been further elaborated, expanded, and organized in a new and more complete form, producing what is substantially a new piece of work. I may say now that this book offers an expanded account of the entire journey that I have made.

* “Shifting Stories: Learning from a Reflective Experiment in a Design Process,” in *The Reflective Turn: Reflective Studies in Practice and on Practice*, ed. D. A. Schön (Teachers College Press, 1990), 285–320. “Between Transient Constructs and Persistent Structures: Designing Systems in Action,” *Journal of Strategic Information Systems* 8 (1999): 331–334. “Technology and the Courtroom: An Inquiry into Knowledge Making in Organizations,” *Journal of Management Studies* 38, no. 7 (2001): 943–971 (with Gerardo Patriotta). “Reshaping Practice across Media: Material Mediation, Medium Specificity, and Practical Knowledge in Judicial Work,” *Organization Studies* 30, no. 12 (2009): 1369–1390. “Remediation of Practices: How New Media Change the Way We See and Do Things in Practical Domains, *First Monday* 15, nos. 6–7 (2010), http://firstmonday.org/ojs/index.php/fm/article/view/3034/2565. “How Technology Remediates Practice: Objects, Rules, and New Media,” *Materiality, Rules, and Regulation: New Challenges for Management and Organization Studies*, ed. F. de Vaujany, N. Mitev, G. F. Lanzara, and A. Mukerjee (London: Palgrave Macmillan, 2015).

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

But I have not walked alone. Along the way, my thinking has been enormously enriched by meeting and working with many scholars and students—in the end, such experiences have made this book possible. My understanding of design practice and reflective inquiry has been shaped by my long-lasting interaction with the late Donald Schön, first as his student and then as his colleague, and through teamwork with Victor Friedman, Wim Overmeer, and Shahaf Gal at the Theseus Institute of Sophia Antipolis. Over the years, endless conversations and close collaboration with Francesco Pardi and Claudio Ciborra, my dear departed friends, and with Barbara Czarniawska, Jannis Kallinikos, and Gerardo Patriotta have greatly contributed to shaping my thinking. To all of them I wish to express my gratitude for having shared with me the same passion for doing research and, above all, for having made me appreciate the value of intellectual friendship. I owe them more than they can guess.

My participation in the computer music development project was made possible by Jeanne Bamberger and Donald Schön in the context of an MIT study on Project Athena, a project for the adoption of the computer in undergraduate education. A small research grant from MIT and financial support by Formez, Italy's government agency for education and innovation, allowed me to work for several months in the computer music laboratory with Jeanne and the software developer Armando Hernandez: they have been great research partners. I feel particularly grateful to Jeanne for both hosting me in her laboratory and patiently guiding me along the meandering paths of the music and computer worlds. Also, I want to thank the members of the MIT music faculty who spent a lot of their time discussing with me the problems of music education and the role of the computer in it. For the research on video technology in judicial practice, I feel indebted to Giuseppe Di Federico, former director of the Research Institute on Judicial Systems of Italy's National Research Council (IRSIG/CNR), for providing the financial and organizational resources for carrying out extensive fieldwork in six major Italian courtrooms. In this endeavor, the long-standing collaboration of Francesco Contini and Marco Fabri of IRSIG/CNR has been precious. The University of Bologna, the London School of Economics and Political Science, the Stanford Center for Organizations Research, the European University Institute in Florence have all been fertile nurturing grounds for ideas and research that fed into this book. Finally, I owe special thanks to Giampiero Lupo for patiently helping me to compile the index. The views expressed here, not to mention the errors, fall under my full moral responsibility.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

I have said that I have not walked alone. Indeed, three persons have been my dear and irreplaceable companions in the walks of life: my wife Grazia, my son Gianandrea, and my daughter Marina. Without their presence and support I doubt I would have ever been able to see the end of this.

This book is dedicated to the memory of Donald Schön—teacher, colleague, and friend.

GFL
Bologna, June 16, 2015

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

## Prologue: On Negative Capability

In November 1966, I happened to be involved in the relief operations of the great Florence flood in Tuscany, when torrential and persistent rains caused the Arno to overflow and inundate the city. At that time I was a young student at the University of Pisa and, together with other students took part in a university rescue team that, a few days after the flood, traveled to Florence to provide whatever help was needed. When we arrived on the site, we couldn't believe our eyes. The city—cradle of the Renaissance—was hardly recognizable. A three-feet-thick layer of mud covered everything; all around, things had taken on the color of the mud. Half of the city had literally become the river bed, and, in the lower parts, the water went up to the level of five meters, reaching the first floor of the buildings. It was a scene of blight and disruption. People were shocked. Many had lost loved ones who had been drawn into the muddy streams and swept away by the force of the river. Private houses and public buildings were shattered, and people were trapped inside. Cars, bikes, public vehicles, and other things were floating everywhere, unusable. Shops and trades were ruined. Celebrated works of art were encrusted with mud. Unique manuscripts and books of high historical value were soaked in muddy waters and lost in the public libraries and cultural institutions. The life of the city was suddenly interrupted. Basic means and tools for action were unavailable. Ordinary routines could not be executed. Nothing worked, and little seemed to be recoverable. Basic utility infrastructures such as water, gas, light, and telephone service had collapsed. Everything was disconnected. A gloomy silence hung over the scene, and the mud, the somber color of the mud, gave everything a ghostly, unreal appearance.

Yet, in the middle of the disaster, though in despair and in great need, people were not completely prostrated: they were not passive at all. Struck by calamity, the citizens of Florence—known since the time of Dante for their internal divisions and endless daily quarrels occasioned by all kinds of motives, both menial and less so—soon began collectively working toward the recovery of the city, showing an unsuspected level of

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

solidarity and proving themselves highly capable at organizing and carrying out collaborative action. People who, in normal times, often behaved as rivalrous, quarreling individuals within highly divisive groups now took effective community action, providing mutual help to one another and working hard at quickly reestablishing the basic activities of daily life.

At the time, I felt as if I were watching an unplanned social experiment taking place in a natural though stressed setting. The city became a sort of social laboratory, where people rediscovered the experience of what it means to both face a seemingly impossible, or even unthinkable, event and try to get things done with the few resources that were available. The question for each and everybody was: What can I do here and now? In spite of the difficulties, new forms of organizing emerged, and behaviors could be observed that are not much seen in the ordinary, nonproblematic situations of daily life. In the aftermath of the flood, the city turned into a large experimental setting where new ways of doing things were tried out in spite of the disrupted situation—or, perhaps, precisely because of it. Stories were being told, even witty ones, such as the one of the "miraculous" therapeutic properties of district- or street-specific kinds of mud for rheumatic pains and skin diseases.[1] The river brought destruction, but it also opened a space for innovation and opportunities for social discovery and learning. New forms of community action emerged at the street and neighborhood level: special long-term loans with low interest rates were offered by the local banks to help local businesses; new techniques were invented for the recovery and restoration of paintings, sculptures, ancient books, and antique furniture; and a deeper understanding of the flood regimen of the river Arno was developed together with the installation of an early warning system.

The Florence flood of 1966 was both an existential and an epistemic experience for me, and the two were deeply intertwined. By landing there as a sort of parachutist, I was thrown into a situation that I had never experienced before and for which I wasn't at all prepared. I was confronting a situation that demanded an engagement in action before one could even make sense of what was going on. But taking action was difficult. There was no specific "place to be" anymore. Time was reset and had to begin anew. People strove to reestablish a minimal social order at the local level. The flood was indeed a cosmological episode of the sort in which one feels suddenly lost, missing

1. In the *quartiere* of Santa Croce, a poster on the wall advertised the following: "People affected by rheumatic pains are advised to visit the Spa in Via dell'Anguillara." Another ad offered: "For skin diseases the mud baths of Borgo de'Greci are highly recommended."

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

both the meaning of the situation and the cognitive means to restore meaning (Weick 1993a). The sense of displacement was so strong that I didn't quite know what to do there at first, and for a while I let myself be absorbed in the emotional and painful sight of human suffering and material disruption. Though it is perhaps odd to say, I found some relief in such moments of suspension, as they helped me relate to the situation and begin to make sense of it. The emotional exposure to disruption moved me to action. For ten days, my fellow students and I tirelessly rescued and cleaned antique books and manuscripts soaked in mud in the basement of Florence National Library, where our rescue team had been posted.

In the following years, the event returned to my mind in flashes over and over again, often unexpectedly. It surfaced in the most disparate situations. In a way, it became part of the underlying background of my existence, of what I now consider to be my basic human experience. I have always lived with it. However, as I recalled the event in my memory, I kept questioning its significance over and over again.

The Florence flood strongly influenced my subsequent style of both thinking and doing research. It did so in ways that I could not realize at that time, but that I discovered only later in the course of my life, when I went back to those distant times in my remembrances and recurrently reflected on why that distant event was still so vivid in my memory and why it kept coming back to me as an ambivalent, elusive ghost or, perhaps, as a beacon for navigation. Retrospectively, I regard it now as a sort of imprinting, a seminal experience that contributed toward giving me a particular sensitivity and attitude toward what I perceive to be questions worth asking and researching. With all the cautions and precautions that retrospective thinking demands, I believe now that the event has played an important role in shaping my way of becoming alert to emergent contingencies, of paying attention to phenomena, and of choosing the things and problems that I perceive as interesting and worthy of being studied. Basically, the event contributed to form my gaze as an observer, teaching me to see and sense things in a particular way. It selectively shaped my way of approaching reality and my cognitive style. I developed a keen interest in studying situations of practice in which some event, change, or novelty interferes with, shakes up, or disrupts the smooth flow of action and meaning, leading to a destructuring and, eventually, to a reshaping of the situation and the practice. This sensitivity I find hard to express in words, but it will hopefully be made evident in this book.

Since the time of the flood, I have seen specific events—discontinuities, disruptions, and "accidents," even small ones—as opportunities for change and redesign, for exploration and innovation, but also as holes for penetrating into the underlying fabric of a practice. I have come to appreciate ruptures and cracks in the texture of reality as

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

"picklocks" for opening up multiple interpretations and paths of action. I have cultivated an analytical passion for the ephemeral, the inconspicuous, and the disconnected, focusing on phenomena and situations characterized by instability, transiency, and restructuring, in which people coping with ambiguity, change, and loss of meaning must strive to reposition themselves in situations of action. In such situations, actors, things, and meanings must be reconnected from their state of disconnectedness. The texture of social life and material things must be rewoven. But familiar forms of action cannot be easily reinstated, and one must resort to improvisation and bricolage, relying on makeshift arrangements that just "make do." In such situations, the observer is compelled to reposition him- or herself and to reflect on his or her own stance as an observer and actor-in-situation.

Both the research work and the thinking that underlie the studies included in this book are linked to that original event (the Florence flood) and seminal experience through a subtle, often subterranean thread. In the years following the flood, as I engaged in keeping track of processes of change and innovation in a variety of organizational and institutional settings, I became gradually aware that, in my approach to the field work and the research material, I transposed my early experience of the Florence flood (as well as my experience, years later, of the 1981 Southern Italy earthquake) to the study of how practices can shift and change owing to the sudden appearance of discontinuities.[2] In other words, I was *seeing* the phenomena of change and innovation in a domain of practice *as* events and situations that shared many features with the more dramatic events I had been involved with.[3] At first, as I unreflectively carried over my previous experience (and my identity as a researcher) to the new settings, I wasn't aware of the transposition, because the *metaphorein* was embedded in my own sensing of the situation and in the role I framed for myself in it as an observer and reflective interventionist. The connection and the bridging were a gradual discovery that unfolded as I kept reflecting on my own method of inquiry.

The questions that can be asked in the two different settings—the setting of a disaster and the research setting—are quite similar:

2. My study of the organizational response to the aftermath of the 1981 earthquake in Southern Italy is reported in Lanzara 1983.

3. For Wittgenstein (1953), *seeing as* is an act of interpretation. When I *see A as B*, I selectively transpose some features of B to A, thus associating objects or situations that might look quite dissimilar at first. In other words, selected features of B are used to structure A and to carry over forms of action across contexts and situations, eventually leading to innovation (Lanzara 1993; Schön 1979).

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

What happens in an established social setting when a disruptive event, such as a flood or an earthquake, breaks into the normal course of daily life? What happens in an established practice or work setting when a novel artifact or tool for doing work changes the familiar work routines?

As I further developed my ideas, it seemed to me that disasters and "accidents" in general could be taken as metaphors for situations characterized by ambiguity and uncertainty, where, perhaps less conspicuously and dramatically, an incoming event, change, or innovation brings a discontinuity into an ongoing system of activities or established practices, pushing individuals and organizations to redesign their current routines, restructure the meaning of the situation and their practical dealings, and reframe taken-for-granted assumptions and practices, thus repositioning themselves in the new situation. Such situations, I claim, are not at all rare in our daily life and in our current practices across a variety of organizational and institutional settings. We encounter problematic situations all the times, and often they demand that we reposition ourselves and reshape our action. In situations of this kind, we experience a break in the normal flow of events before we can even make sense of it: the smooth flow of nonproblematic action cannot be sustained, and we have to slow down or suspend our familiar routines, step back for a while, and think about them. Ordinariness is disrupted by the discontinuity and must be reestablished through the patient reweaving of the normal fabric of human life.

Uncertain and unfamiliar situations, in which ordinary experience and sense are disrupted, require from the actors a great deal of the quality that poet John Keats has called Negative Capability:

> that is, when man is capable of being in uncertainties, Mysteries, doubts, without any irritable reaching after fact and reason. (John Keats, letter to George and Thomas Keats, December 21, 1817 [Keats 1962])

According to Keats, Negative Capability is the distinctive quality that forms "a man of achievement," one who accepts moments of indeterminacy and loss of direction and is able to capture the potentialities of understanding and acting that are revealed by such moments.[4] It involves the ability of being "content with half knowledge," keeping things in a sort of suspended animation (or in active suspension). Yet the state of suspension does not necessarily lead us to inactivity, passive reception, or closure; rather,

4. Keats mentions William Shakespeare as possessing "enormous" Negative Capability and being a paramount example of a man of achievement in the domain of poetry and drama (letter, December 21, 1817, in Keats 1962).

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

it is open to letting events follow their course and letting us be seized by the world as it comes to us, being in a state of watchful alertness, but with no pretension or impatience to fix an event's direction, rhythm, and final ending. The idea of Negative Capability has some kinship with the existential attitude Martin Heidegger has called *Gelassenheit*, the spirit of *disponibilité* before What-is (Heidegger [1927] 1962). People endowed with Negative Capability are capable of being receptive to the world, penetrating into situations, objects, and living beings and, in turn, letting themselves be penetrated by them.[5] They are gifted with a particular sensitivity that enables them to trace the erratic whirls of a leaf in the wind and make sense of them; to watch the recurrent, endless movement of the waves of the sea and appreciate how each of them is similar to and, at the same time, different from the next one, and yet is unique; or, to steal an image used by Keats, that helps them to understand the sparrow "picking about the gravel."[6] We come to grasp these phenomena by sensing rather than knowing; in a way, we resonate with the phenomena before we actually know them.[7] However, this *disponibilité* and existential openness to experiencing the uncertainty of the world also brings with it a cognitive disposition: the indeterminacy enables us to pay attention to things and features that in normal situations would go unnoticed and therefore be considered unimportant. We come to see and appreciate things that cannot be seen when we are involved in the nonproblematic execution of daily routines. We are pulled to explore possibilities for sense-making and acting that would not easily come to mind in ordinary situations. Discontinuities and fluctuations hide a potential

5. In another letter to J. H. Reynolds (Letter 62), Keats (1962) calls this attitude "diligent indolence," stating that he would rather be a flower than a bee: a flower opens the petals to receive, whereas a bee goes buzzing around hunting for nectar, that is, with a purpose.

6. "If a sparrow comes before my window, I take part in its existence and pick about the gravel" (John Keats, letter to Benjamin Bailey, November 22, 1817, in Keats 1962). Such taking part requires being gifted with a capacity to feel rather than to reason.

7. In situations of this kind, sensing comes before understanding. Interestingly, similar ideas are expressed, in a distant domain of human inquiry, by Francisco Varela, the late Chilean neurobiologist and systems theorist, who found evidence that some insects respond to specific variations in their surrounding environment by "resonating" or "buzzing" with appropriate frequencies, which record their sensing of the variation and their coping with it. Based on his studies of the human brain and taking inspiration from Merleau-Ponty's phenomenology of perception, Varela argues that cognitive activity originally manifests itself through such sensing and that more structured forms of knowledge result from successful coping and from ongoing interaction with the medium (Varela 1994; this approach is more fully articulated in Varela, Thompson, and Rosch 1991).

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

for innovation for those who have tolerance for the uncertainty and ambiguity associated with the loss of sense and structure. These possibilities remain precluded to people who do not possess the existential capability to experience a phenomenon free from epistemological bounds.

Actors endowed with Negative Capability are able to maintain an existence, a "being" in troublesome situations where any possibility of being and acting seems to be denied or is hard to sustain. They accept their state of vulnerability and leverage it into a means for acting and sense-making. Even in the midst of radical uncertainty and in spite of the discontinuity that affects their normal course of life, they are able to design and experiment with new routines and forms of action. Negative Capability is the source of a particular mode of action: an action that surges from the void, from the loss of sense and order, but is open to the enactment of possible worlds.

In this perspective, Negative Capability supports thinking and acting across contexts. Work is done not just *within*, but *with* or *through* the constraints of a given context in order to reshape it and generate new forms of action. To produce innovation, action needs not be radically new or revolutionary in the common sense of the term. It need not set itself Faustian goals. Even simple, apparently inconspicuous actions that trespass an accepted boundary and question what we take for granted, or actions that establish new linkages and throw bridges across traditionally separate domains, can be highly innovative, leading to seeing and doing familiar things in unprecedented ways. In this connection, Roberto Mangabeira Unger (1987) has transposed the idea of Negative Capability to the domain of social and political reform, arguing that it is a quality very much in demand when social actors set out to deny the "false necessity" of the actual social and political order and strive to reinvent it by going beyond the constraints and entrapments of the actual context. Revising and reframing established institutional arrangements and the underlying cognitive imageries requires being able to work through the discontinuity between the previous and the emerging arrangements, suspended in a sort of nowhere land where the previous order has been relinquished but the future one has not yet begun. In such an ambiguous state, action is not (or cannot be) performative in the sense of reaching out for clear goals, but is rather directed at exploring possibilities and experimenting with patched-up, makeshift arrangements. As is the case of the immediate aftermath of a natural disaster, one is caught in the contrasting pressures and the dilemmas engendered by the discontinuity: some sense and order must be reestablished, but the stable and solid ground on which we used to stand has collapsed, and we are left groping in muddy waters. The rising anxiety collides with patience: anxiety pushes us to search

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

for quick fixes, while patience demands high tolerance for ambiguity and time for learning.

What is a discontinuity, then? And what constitutes a discontinuity empirically? Ambiguously, a discontinuity is a perceived gap that should be "filled" so that the normal flow of action or the fabric of a situation can be restored, and, simultaneously, it is a time and a place where something ends and something else begins. A discontinuity marks both an ending and a new beginning. As an ending, it may produce displacement and loss of meaning; as a beginning, it can be an entry point to a new situation or state of affairs, where familiar objects and relations change and rules other than the usual ones must be created, a place where the world as experienced so far no longer holds up and things once familiar look suddenly unfamiliar. I like to think that a discontinuity can be a sort of gateway, a "stargate" connecting us to different worlds and dimensions of reality.

It is useful to dwell a bit on our ways of conceptualizing a discontinuity. Let us focus on discontinuity in time, which is what mostly interests us here. We tend to conceptualize it as a spot-like event, drawing a clear-cut separation between before and after, or between two sides of a well-defined ridge. But it need not be so. The line of separation is often more blurred and shifting than our concept suggests. In other words, a discontinuity may have a temporal span: it can last for a while, sometimes even for quite a long time, and might not even be perceived as such by the people who live through it. A historical discontinuity, for example, can take the form of a smooth transformation to a different arrangement. One may thus travel through a discontinuity, and perhaps even thrive in it, without even realizing that one is caught in it. A discontinuity, and the sense of it, is often a retrospective reconstruction. But empirically what we call a discontinuity is characterized by entangled processes, where things past never come to a complete annihilation and things future never come to a complete unfolding and fulfillment. In discontinuities, there is always transformation, recombination, and reshuffling of elements.

Making sense of a discontinuity is not a trivial matter. On the one hand, *before* the discontinuity, new features and odd things might emerge that we don't perceive as such or are not even able to see, but which we learn to see only after the discontinuity. On the other hand, *in the aftermath* of the discontinuity, we may find many things and features from before the discontinuity that are carried over across the discontinuity and stay with us, though in a mutated semblance.

Owing to its peculiar features, a discontinuity can be turned into an epistemic tool, becoming an opportunity for reframing knowledge. Pragmatic actors can use it to

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

reshape the practice, and analysts can turn a discontinuity into a methodological picklock. A discontinuity can be intelligently exploited to provide access to situations of action. For example, one can treat dramatic events, such as the Florence flood or a major earthquake, as large-scale social experiments (although that may sound a bit cynical). But that can be done as well with smaller-scale and definitely less disruptive happenings—for example, the introduction of an innovation, such as the appearance of a new work tool or method in the workplace. Thus, events become opportunities to conduct natural experiments in noncontrived settings and to set up laboratories for testing theories and producing change (Lanzara 1983). Alternatively, discontinuities can be deliberately produced by the observer-interventionist in order to carry out a practical experiment in a situation of practice. Deliberately induced discontinuities can be real or simply imaginary figments of the observer's imagination. For the purpose of observation and knowledge-making, the observer may, for example, deliberately stretch out the situation observed by amplifying or distorting selected features in order to bring to the surface phenomena that look inconspicuous or lie hidden behind the veils of the ordinary. This, in other words, is a noncanonical, almost irreverent way of using selective bias as an epistemic technique. By doing that, a microevent, apparently inconspicuous and uninteresting, is turned into a "macrocosm of meaning."[8] The purpose, and the perspective, of the observer is not so much to strike a faithful representation of the situation observed and achieve a presumably "objective" truth; rather, the observer strives to dig up and reveal aspects that lie buried under the surface of reality and, being perceived as ordinary, go unnoticed. This methodological procedure is based on an iconic transformation of the real.

To study innovation as a phenomenon, then, one must search for situations of discontinuity and rupture and explore them in depth, because it is in the occurrence of such situations, minimal and transient as they may be, that a possibility for understanding change and for intervention arises. In many instances, it is necessary to be able to observe phenomena that are lurking under the surface or in the interstices of what we consider obvious or ordinary (that is, what makes reality for us) and are not immediately remarkable. This requires a particular treatment of the materials similar to a fictional technique. It consists of an iconic transformation of the real enacted through

8. This expression is used by Clifford Geertz to describe the world that the interpretive anthropologist generates when he digs deeply into a specific social event or the detailed aspects of a culture and unearths its unsuspected complexity. See, e.g., Geertz's essay on the Bali cockfight, "Deep Play" (Geertz 1983).

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

the deliberate amplification or distortion of events and situations in order to reveal hidden, inconspicuous, or peripheral aspects of them—aspects that do not lend themselves to straightforward observation. In iconic transformation, there is not just selection, nor is there free invention of new traits independent of the situation; rather, there is a purposeful accentuation of traits.[9] By virtue of such an operation of stretching, a spot-like action, a mundane object, an inconspicuous event, or a microsituation can be "blown up" into a macrocosm of meaning, giving rise to multiple worlds, structures, and representations. It is as if one used a magnifying lens to gain selective access to phenomena that the naked eye would not be able to observe.[10] Such a procedure essentially amounts to creating an active icon. It is not much different from the symbolic operation of creating a brand for a product or a company for marketing and advertising purposes. However, although in the business world the purpose is to enhance the product's desirability and demand in the market, here the strategy is oriented toward achieving the maximum effect in terms of meaning and theory making. These aspects of the transformation make it similar to what artists do. Indeed, the transformation of reality has always been the essence of art, where the fiction enables the capturing of the essence of an object, the appreciation of a situation, or the representation of a value. Novelists and figurative artists often use such techniques of transfiguration of the real to produce unrealistic, hyperrealistic, or paradoxical effects, or strange worlds of all kinds, fantasies that in their exaggerated form may reveal unexpected and surprising features. In painting, for example, cubism has decomposed space and the human figure by introducing multiple and simultaneous points of view in the same picture; surrealist painting has exposed us to the sight of things that look more real than real objects, to the point of looking strangely unreal. On their part, playwrights create characters by accentuating psychological or moral traits so as to make iconic exemplars of human types. Similarly, the novelist Italo Calvino, a literary scientist and experimenter in his own right, has used descriptive and narrative techniques that zoom in on the object of

9. It is very close to the effect produced by a caricature that helps us capture specific traits or the character of a person.

10. In the study of practices, a strategy of observation that has some affinity with the iconic transformation of the real has been used by Davide Nicolini (2009). The strategy is based on the metaphorical movement of "zooming in and zooming out" of practice. The zooming in and out is obtained through switching theoretical lenses and repositioning in the field, so that certain aspects of the practice are foregrounded while others are bracketed (Nicolini 2009). I should say that zooming in and out usually entails size reduction and enlargement, not necessarily stretching or deformation of features—but bracketing and foregrounding, taken to the extreme, may lead to iconic transformation.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

description to the point of transfiguring it, as in the close observation of the gecko lizard in *Palomar*. And in another work, the novel *If on a Winter's Night a Traveler*, he explores the elusive relationships between reality, fiction, and fakery by taking different points of view to look at the same events and producing different versions of the same story. In doing so, Calvino questions his own motives in the writing process, and he explores the meaning of objectivity by bringing narrative technique to a sort of metafiction. The reader is dragged into a labyrinth in which she or he becomes aware that reality, or what she or he thinks reality is, is always at stake.

Even if this prologue comes several years after I worked on the two large studies that make up the bulk of this book, it has been written to give the reader a sense of the spirit that has animated my work throughout the years. I hope it will give the reader an understanding of the kind of sensitivity that has guided my inquiries into processes of design and change in practice settings. It is a sensitivity that perhaps existed only as a dormant potential when I first engaged in this kind of inquiry; it needed only to be aroused, and it was developed and refined over time through my very same research experiences. As I understand it now, behind such sensitivity lies primarily a way of interacting with things and humans, rather than, and before, a way of knowing. Particularly, I have tried to study the details of phenomena in a way that makes visible the intimate relationship that exists between the observer's theories and methods and the practitioners' theories and practices. In this sense, theorizing, as I have tried to practice it, is always grounded in some form of involvement with the research setting. The reader will judge whether this way of interacting, or sensing, brings a valuable contribution to understanding and knowledge-building.

The book is organized in four parts. In the first part, I discuss methodological themes encountered in my studies and problems of the research design. In the second and third parts, two extended, in-depth studies are presented, focusing on processes of design and innovation in two practice settings—music education and criminal justice. Technology adoption and reconfiguration of the practice take place in two institutional settings—the music school of a leading academic and research institution in the United States and the criminal courts of Italy. The fourth and final part articulates further inquiries into theoretical issues emerging from the two studies and explores selected aspects of the practice of innovation. An epilogue, with reflections on the work done and the researcher's role, seals the book.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

## References

Argyris, C. 1980. *The Inner Contradictions of Rigorous Research*. New York: Academic Press.

Argyris, C., R. Putnam, and D. McLain Smith. 1985. *Action Science*. San Francisco, CA: Jossey Bass.

Argyris, C., and D. A. Schön. 1989a. Conceptions of causality in social theory and research: Normal science and action research compared. Unpublished manuscript, Harvard University.

Argyris, C., and D. A. Schön. 1989b. Participatory action research and action science compared: A commentary. *American Behavioral Scientist* 32 (5): 612–623.

Argyris, C., and D. A. Schön. 1991. Participatory research and action science compared. In *Participatory Action Research*, ed. W. Foote Whyte, 85–96. Newbury Park, CA: Sage.

Argyris, C., and D. A. Schön. 1996. *Organizational Learning II: Theory, Method, and Practice*. Reading, MA: Addison Wesley.

Arthur, B. A. 1989. Competing technologies, increasing returns, and lock-in by historical events. *Economic Journal* 99:116–131.

Bamberger, J. 1991. The laboratory for making things. In *The Reflective Turn: Case Studies on and in Educational Practice*, ed. Donald A: Schön, 37–62. New York: Teachers College Press.

Bamberger, J. 2000. *Developing Musical Intuitions*. New York: Oxford University Press.

Bamberger, J., and A. diSessa. 2003. Music as embodied mathematics: A study of a mutually informing affinity. *International Journal of Computers for Mathematical Learning* 8:123–160.

Bamberger, J., and D. A. Schön. 1983. Learning as reflective conversation with materials. *Art Education* (March): 68–73.

Bateson, G. 1972. *Steps to an Ecology of the Mind*. Chicago: University of Chicago Press.

Baudrillard, J. 1968. *Le système des objets*. Paris: Gallimard.

Berg, M. 2000. Lesson from a dinosaur: Mediating IS research through an analysis of the medical record. In *Organizational and Social Perspectives in Information Technology*, ed. Baskerville, R., J. Stagie, and J. DeGross, 487–504. Boston: Kluwer.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Berg, P. O., and K. Kreiner. 1990. Corporate architecture: Turning physical settings into symbolic resources. In *Symbols and Artifacts: Views of the Corporate Landscape*, ed. P. Gagliardi, 41–67. New York: Aldine de Gruyter.

Berger, A. 2007. *Drosscape: Wasting Land in Urban America*. Princeton: Princeton Architectural Press.

Blackler, F. 1990. Knowledge, knowledge work, and organizations: An overview and interpretation. *Organization Studies* 16 (6): 1021–1046.

Boisot, M. 1999. *Knowledge Assets*. Oxford: Oxford University Press.

Boland, R. 1978. The process and product of system design. *Management Science* 28 (9): 887–898.

Bolter, J. D. 2001. *Writing Space: The Computer, Hypertext, and the Remediation of Print*. Mahwah: Erlbaum.

Bolter, J. D., and R. Grusin. 1999. *Remediation: Understanding New Media*. Cambridge, MA: MIT Press.

Brown, J. S., and P. Duguid. 1991. Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation. *Organization Science* 2:40–57.

Brown, J. S., and P. Duguid. 1996. The social life of documents. *First Monday* 1 (1): 1–19.

Burnett, R. 2004. *How Images Think*. Cambridge, MA: MIT Press.

Carroll, L. (1865) 1971. *Alice's Adventures in Wonderland*. Oxford: Oxford University Press.

Cassano, F. 1989. *Approssimazione: Esercizi di esperienza dell'altro*. Bologna: Il Mulino.

Chandler, D. 1995. *The Act of Writing: A Media Theory Approach*. Aberystwyth: University of Wales.

Chandler, D. 1996. Engagement with media: Shaping and being shaped. *Computer-Mediated Communication Magazine* 3 (2) (February 1).

Ciborra, C. U. 1998. Crisis and foundations: An inquiry into the nature and limits of models and methods in the information sstems discipline. *Journal of Strategic Information Systems* 7 (1): 5–16.

Ciborra, C. U. 1999. Hospitality and IT. In *Proceedings of the 22nd Information Systems Research Seminar in Scandinavia (IRIS'22)*, ed. T. Kakola. August. Keuruu, Finland.

Ciborra, C. U., and Associates (Kristin Braa, Antonio Cordella, Bo Dahlbom, Angelo Failla, Ole Hanseth, Vidar Hepso, Jan Ljungberg, Eric Monteiro, and Kai A. Simon). 2000. *From Control to Drift: The Dynamics of Corporate Information Infrastructures*. Oxford: Oxford University Press.

Ciborra, C. U., and G. F. Lanzara. 1994. Formative contexts and information systems: Understanding the dynamics of innovation in organizations. *Accounting Management and Information Technologies* 4 (2): 61–86.

Contini, F. 1993. La videoregistrazione presso la II Sezione della Corte d'Assise di Bologna. In *Verbalizzazione degli atti processuali, tecnologie video e gestione dell'innovazione nell'amministrazione*

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

*della giustizia*, ed. G. Di Federico, G.F. Lanzara, and A. Mestitz, 113–144. Rome: Consiglio Nazionale delle Ricerche.

Cook, S. D. N., and J. S. Brown. 1999. Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science* 10 (4): 381–400.

Cooper, R. 1998. Assemblage notes. In *Organized Worlds: Explorations in Technology and Organization with Robert Cooper*, ed. R. C. H. Chia, 108–129. London: Routledge.

Crespi, F. 1991. Limiti della morale e apertura etica nell'esperienza post-moderna. In *Etica e scienze sociali*, ed. F. Crespi, 13–32. Turin: Rosemberg and Sellier.

Czarniawska, B. 2009. How institutions are inscribed in technical objects and what it may mean in the case of the Internet. In *ICT and Innovation in the Public Sector: European Studies in the Making of E-government*, ed. F. Contini and G. F. Lanzara, 49–87. Basingstoke: Palgrave Macmillan.

Dahlbom, B., and L. E. Janlert. 1996. Computer future. Unpublished manuscript.

Damaska, M. R. 1991. *The Faces of Justice and State Authority: A Comparative Approach to the Legal Process*. New Haven: Yale University Press.

Daston, L., ed. 2004. *Things That Talk: Object Lessons from Art and Science*. New York: Zone Books.

Davenport, T. H., and L. Prusak. 1998. *Working Knowledge: How Organizations Manage What They Know*. Boston: Harvard Business Press.

David, P. A. 1986. Clio and the economics of qwerty. *American Economic Review* 75 (2): 332–337.

David, P. A. 1994. Why are institutions the "carriers of history"? Path dependence and the evolution of conventions, organizations, and institutions. *Structural Change and Economic Dynamics* 5 (2): 295–220.

de Tocqueville, A. (1835) 2004. *Democracy in America*. Trans. Arthur Goldhammer. New York: Literary Classics of the United States.

Dewey, J. (1922) 2002. *Human Nature and Conduct*. Mineola, NY: Dover.

Dibben, M. R., and J. B. Cobb Jr. 2003. Special focus: Process thought and organization studies. *Process Studies* 32 (2): 179–182.

Dilthey, W. (1883) 1991. *Introduction to the Human Sciences*. Princeton: Princeton University Press.

Dorrance Kelly, S. 2004. Seeing things in Merleau-Ponty. In *Cambridge Companion to Merleau-Ponty*, ed. T. Carman and M. B. N. Hansen, 74–110. Cambridge: Cambridge University Press.

Dourish, P. 1993. Culture and control in media space. In *Proceedings of the Third European Conference on Computer-Supported Cooperative Work*, ECSCW'93, 125–137. Milan, Italy, September 13–17. Dordecht: Kluwer Academic.

Doxtater, D. 1990. Meaning of the workplace: Using ideas of ritual place in design. *Symbols and Artifacts: Views of the Corporate Landscape*, ed. P. Gagliardi, 125–137. New York: Aldine de Gruyter.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Dreyfus, H. 1991. *Being-in-the-World: A Commentary on Heidegger's* Being and Time, *Division I*. Cambridge, MA: MIT Press.

Dubois, P. 1981. Figures de ruine: Notes pour une esthéthique de l'index. *Rivista di Estetica* 21 (8): 8–19.

Duhl, L. J. 1990. *The Social Entrepreneurship of Change*. New York: Pace University Press.

Eisenhardt, K. M. 1989. Building theories from case study research. *Academy of Management Review* 14 (4): 532–550.

Elster, J. 1983. *Explaining Technical Change: A Case Study in the Philosophy of Science*. Cambridge: Cambridge University Press.

Foote Whyte, W., ed. 1991. *Participatory Action Research*. Thousand Oaks, CA: Sage.

Forrester, J. W. 1971. Counterintuitive behavior of social systems. *Technology Review* 73 (3): 52–68.

Freud, S. (1930) 1989. *Civilization and Its Discontents*. New York: W. W. Norton.

Gadamer, H. G. (1975) 1989. *Truth and Method*, 2nd rev. ed., trans. J. Weinsheimer and D. G. Marshall. New York: Crossroad.

Gagliardi, P., ed. 1990. *Symbols and Artifacts: Views of the Corporate Landscape*. New York: Aldine de Gruyter.

Garfinkel, H. 1967. *Studies in Ethnomethodology*. Englewood Cliffs, NJ: Prentice-Hall.

Geertz, C. 1973. *The Interpretation of Cultures*. New York: Basic Books.

Geertz, C. 1983. *Local Knowledge: Further Essays in Interpretive Anthropology*. New York: Basic Books.

Genschel, P. 1997. How fragmentation can improve coordination. *Organization Studies* 18 (2): 602–622.

Gibson, J. J. 1979. *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.

Goodman, N. 1976. *Languages of Art*. New York: Hackett.

Goodman, N. 1978. *Ways of Worldmaking*. New York: Hackett.

Greenpeace Report. 2014. *Green Gadgets: Designing the Future: The Path to Greener Electronics*. http://www.greenpeace.org/international/en/publications/Campaign-reports/Toxics-reports/Green-Gadgets/ (last accessed September 3, 2014).

Hanseth, O. 1996. Information technology as infrastructure. PhD dissertation, Goteborg University, Goteborg.

Hanseth, O., and K. Lyytinen. 2010. Design theory for dynamic complexity in information infrastructures: The case of building Internet. *Journal of Information Technology* 25:1–19.


Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Hanseth, O., and E. Monteiro. 1997. Inscribing behavior in information infrastructure standards. *Accounting Management and Information Technologies* 7 (4): 183–211.

Harman, G. 2009. Technology, objects, and things in Heidegger. *Cambridge Journal of Economics* 34 (1): 17–25.

Hayles, N. K. 2002. *Writing Machines*. Cambridge, MA: MIT Press.

Heath, C., and P. Luff. 1992. Collaboration and control: Crisis management and multimedia technology in London underground control rooms. *Computer Supported Cooperative Work* 1 (1–2): 69–94.

Heidegger, M. (1927) 1962. *Being and Time*. New York: Harper & Row.

Hernes, T. 2008. *Understanding Organization as Process: Theory for a Tangled World*. London: Routledge.

Hernes, T. 2014. *A Process Theory of Organization*. Oxford: Oxford University Press.

Herskovic, M. 2003. *American Abstract Expressionism of the 1950s: An Illustrated Survey*. New York: New York School Press.

Hess, B. 2005. *Abstract Expressionism*. Cologne: Taschen Books.

Hofstader, D. R. 1979. *Gödel, Escher, Bach: An Eternal Golden Braid*. New York: Basic Books.

Kallinikos, J. 1995. The architecture of the invisible: Technology is representation. *Organization* 2 (1): 117–140.

Kallinikos, J. 2002. Reopening the black box of technology: Technology and human agency. ICIS 2002 Proceedings. Paper 26. http://aisel.aisnet.org/icis2002/26.

Kallinikos, J. 2003. Mediated action and representation: On the vicissitudes of human signification. *Homo Oeconomicus* 19 (4): 607–622.

Kallinikos, J. 2006. *The Consequences of Information: Institutional Implications of Technological Change*. Cheltenham: Edward Elgar.

Kallinikos, J. 2009. On the computational rendition of reality: Artefacts and human agency. *Organization* 16 (2): 183–202.

Kallinikos, J. 2011. *Governing through Technology*. Basingstoke: Palgrave Macmillan.

Kallinikos, J., A. V. Aaltonen, and A. Marton. 2013. The ambivalent ontology of digital objects. *Management Information Science Quarterly* 37 (2): 357–370.

Kallipoliti, L. 2005. Dross: Re-genesis of diverse matter: A design post-praxis. ACSA Annual Meeting, US National Conference, Chicago, Illinois.

Kallipoliti, L. 2010. Dross city. In “EcoRedux: Design Remedies for an Ailing Planet.” Special issue, *Architectural Design* 80 (6): 102–109.


Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Kaptelinin, V. 2013. The mediational perspective on digital technology: Understanding the interplay between technology, mind, and action. In *The SAGE Handbook of Digital Technology Research London*, ed. S. Price, C. Jewitt, and B. Brown, 203–217. Thousand Oaks, CA: Sage.

Keats, J. 1962. Letter to George and Tom Keats, December 21, 27 (?), 1817. In *Poems and Selected Letters of John Keats*, ed. C. Baker. New York: Bantam Books.

Kelman, H. C. 1982. Ethical issues in different social science methods. In *Ethical Issues in Social Science Research*, ed. T. L. Beauchamp, R. R. Faden, R. J. Wallace, and L. Walters, 40–98. Baltimore: The Johns Hopkins University Press.

Kemmis, S., C. Edwards-Groves, J. Wilkinson, and I. Hardy. 2012. Ecologies of practices: Learning practices. In *Practice, Learning, and Change*, ed. P. Hager, A. Lee, and A. Reich, 33–50. London: Springer.

Kimberly, J. R. 1976. Issues in the design of longitudinal organizational research. *Sociological Methods & Research* 4 (3): 321–348.

Kittler, F. A. 1997. *Literature, Media, Information Systems: Essays*. Ed. J. Johnston. Amsterdam: G and B Arts International.

Kittler, F. A. 1999. *Gramophone, Film, Typewriter: Writing Science*. Stanford, CA: Stanford University Press.

Kuhn, T. S. 1962. *The Structure of Scientific Revolutions*.Chicago: University of Chicago Press.

Langley, A., C. Smallman, H. Tsoukas, and A. H. Van de Ven. 2013. Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal* 56 (1): 1–13.

Lanzara, G. F. 1983. Ephemeral organizations in extreme environments: Emergence, strategy, extinction. *Journal of Management Studies* 20 (1): 71–95.

Lanzara, G. F. 1991. Shifting stories: Learning from a reflective experiment in a design process. In *The Reflective Turn: Case Studies in and on Educational Practice*, ed. D. A. Schön, 285–320. New York: Teachers College Press.

Lanzara, G. F. 1993. *Capacità Negativa: Competenza progettuale e modelli d'intervento nelle organizzazioni*. Bologna: Il Mulino.

Lanzara, G. F. 1999. Between transient constructs and persistent structures: Designing systems in action. *Journal of Strategic Information Systems* 8:331–349.

Lanzara, G. F. 2009. Reshaping practice across media: Material mediation, medium specificity, and practical knowledge in judicial work. *Organization Studies* 30 (12): 1369–1390.

Lanzara, G. F. 2010. Remediating practices: How new media change the way we think and do things in practical domains. *First Monday* 15:5–6.

Lanzara, G. F., and G. Patriotta. 2001. Technology and the courtroom: An inquiry into knowledge making in organizations. *Journal of Management Studies* 38 (7): 943–971.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Latour, B. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.

Leonardi, P., B. Nardi, and J. Kallinikos, eds. 2012. *Materiality and Organizing*. Oxford: Oxford University Press.

Lévi-Strauss, C. 1966. *The Savage Mind*. Chicago: University of Chicago Press.

Lewin, K. Z. 1935. *A Dynamic Theory of Personality: Selected Papers*. New York: McGraw Hill.

Luhmann, N. 1982. *The Differentiation of Society*. Trans. S. Holmes and C. Larmore. New York: Columbia University Press.

Luhmann, N. 1995. *Social Systems*. Stanford, CA: Stanford University Press.

Luhmann, N. 1998. *Observations on Modernity*. Stanford, CA: Stanford University Press.

Mangham, I. L., and M. A. Overington. 1987. *Organizations as Theater: A Social Psychology of Dramatica Appearances*. Chichester, NY: Wiley.

Manovich, L. 2001. *The Language of the New Media*. Cambridge, MA: MIT Press.

Maras, S., and D. Sutton. 2000. Medium specificity re-visited. *Convergence* 6 (2): 98–113.

March, J. G. 1991. Exploration and exploitation in organizational learning. *Organization Science* 2 (1): 71–87.

March, J. G. 1994. The evolution of evolution. In *The Evolutionary Dynamics of Organizations*, ed. J. A. C. Baum and J. V. Singh. Oxford: Oxford University Press.

Mayo, E. G. 1949. *The Social Problems of an Industrial Civilization*. Oxford: Routledge.

McLuhan, M. 1964. *Understanding Media: The Extensions of Man*. London: McGraw Hill.

Melucci, A. 1989. Frontierland: La ricerca sociologica tra attore e sistema. In *Itinerari sistemici nelle scienze sociali: Teorie e bricolage*, ed. M. Ingrosso. Milan: Franco Angeli.

Merleau-Ponty, C. 1962. *Phenomenology of Perception*. Trans. A. Fisher. London: Routledge, Taylor & Francis.

Meyer, J. W., J. Boli, and G. Thomas. 1987. Ontology and rationalization in the Western cultural account. In *Institutional Structure: Constituting State, Society, and the Individual* ed. G. M. Thomas, J. W. Meyer, F. O. Ramirez, and J. Boli, 9–27. Beverly Hills, CA: Sage.

Miettinen, R. 2009. Artifact mediation in Dewey and in cultural-historical activity theory. *Mind, Culture, and Activity* 8 (4): 297–308.

Miettinen, R., D. Samra Fredericks, and D. Yanow. 2009. Re-turn to practice: An introductory essay. *Organization Studies* 30 (12): 1309–1327.

Miller, D., and P. H. Friesen. 1982. Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic Management Journal* 3 (1): 1–25.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Morganti, U. 1993. La videoregistrazione presso la II Sezione Penale del Tribunale di Roma. In *Verbalizzazione degli atti processuali, tecnologie video e gestione dell'innovazione nell'amministrazione della giustizia*, ed. G. Di Federico, G. F. Lanzara, and A. Mestitz, 55–112. Rome: Consiglio Nazionale delle Ricerche.

Nardi, B. A., and V. O'Day. 1999. *Information Ecologies: Using Technology with Heart*. Cambridge, MA: MIT Press.

Neff, G. N., and D. Stark. 2004. Permanently beta: Responsive organizations in the internet era. In *Society Online: The Internet in Context*, ed. P. E. N. Howard and S. Jones. Thousand Oaks, CA: Sage.

Nicolini, D. 2009. Zooming in and out: Studying practices by switching theoretical lenses and trailing connections. *Organization Studies* 30 (12): 1391–1418.

Nicolini, D., S. Gherardi, and D. Yanow, eds. 2003. *Knowing in Organizations: A Practice-Based Approach*. Armonk, NY: M. E. Sharpe.

Nonaka, I., and H. Takeuchi. 1995. *The Knowledge-Creating Company*. Oxford: Oxford University Press.

Olafson, F. A. 1979. *The Dialectics of Action*. Chicago: University of Chicago Press.

Orlikowski, W. J. 2002. Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science* 13 (3): 249–273.

Orlikowski, W. J. 2006. Material knowing: The scaffolding of human knowledgeability. *European Journal of Information Systems* 15:460–466.

Orlikowski, W. J., and J. Yates. 1994. Genre repertoire: The structuring of communicative practices in organizations. *Administrative Science Quarterly* 39 (4): 541–574.

Papert, S. (1980) 1986. *Mindstorms*. Cambridge, MA: MIT Press.

Pask, G. 1976. *Conversation Theory: Applications in Education and Epistemology*. Amsterdam: Elsevier.

Patriotta, G. 2003. *Organizational Knowledge in the Making*. Oxford: Oxford University Press.

Pentland, B. T. 1999. Building process theory with narrative: From description to explanation. *Academy of Management Review* 24 (4): 711–724.

Pettigrew, A. M. 1985. *The Awakening Giant: Continuity and Change in Imperial Chemical Industry*. Oxford: Blackwell.

Pettigrew, A. M. 1997. What is processual analysis? *Scandinavian Journal of Management* 13 (4): 337–348.

Pettigrew, A. M. 2003. Strategy as process, power, and change. In *Images of Strategy*, ed. S. Cummings and D. Wilson, 301–330. Oxford: Blackwell.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Plowman, L. 1994. The "primitive mode of representation" and the evolution of interactive multimedia. *Journal of Educational Multimedia and Hypermedia* 3 (3–4): 275–293.

Polanyi, M. 1967. *The Tacit Dimension*. New York: Anchor Books.

Powell, W. W., and P. DiMaggio, eds. 1991. *The New Institutionalism in Organizational Analysis*. Chicago: University of Chicago Press.

Quine, W. V. O. 1960. *Word and Object*. Cambridge, MA: MIT Press.

Rice, R. E., and E. M. Rogers. 1980. Re-invention in the innovation process. *Knowledge: Creation, Diffusion. Utilization* 1 (4): 499–514.

Rogoff, B., and J. Lave, eds. 1984. *Everyday Cognition: Its Development in Social Context. Cambridge*. MA: Harvard University Press.

Sacks, H. 1985. Notes on methodology. In *Structures of Social Action: Studies in Conversation Analysis*, ed. M. Atkinson and J. Heritage, 21–27. Cambridge: Cambridge University Press.

Sanchez, R., and A. Heene, eds. 1997. *Learning and Knowledge Management*. Chichester: John Wiley.

Schama, S. 2006. *The Power of Art*. BBC, http://www.bbc.co.uk/arts/powerofart/ (last accessed December 30, 2013).

Schatzki, T., K. Knorr Cetina, and E. von Savigny, eds. 2001. *The Practice Turn in Contemporary Theory*. London: Routledge.

Schön, D. A. 1971. *Beyond the Stable State*. Harmondsworth: Penguin Books.

Schön, D. A. 1979. Generative metaphor: A perspective on problem setting in social policy. In *Metaphor and Thought*, ed. A. Ortony, 254–283. Cambridge: Cambridge University Press.

Schön, D. A. 1982. The fear of innovation. In *Science in Context: Readings in the Sociology of Science*, ed. B. Barnes and D. Edge, 290–302. Cambridge, MA: MIT Press.

Schön, D. A. 1983. *The Reflective Practitioner*. New York: Basic Books.

Schön, D. A. 1985. *The Design Studio: An Exploration of Its Traditions and Potentials*. London: RIBA.

Schön, D. A. 1987 a. *Educating the Reflective Practitioner*. San Francisco: Jossey-Bass.

Schön, D. A. 1987 b. Institutional learning in shelter and settlement policies. In *Shelter, Settlement, and Development*, ed. L. Rodwin. London: Allen & Unwin.

Schön, D. A., ed. 1991. *The Reflective Turn: Case Studies on and in Educational Practice*. New York: Teachers College Press.

Schön, D. A. 1992. Design as a conversation with the materials of a design situation. *Research in Engineering Design* 3:131–147.

Schön, D. A. 1995. Knowing-in-action: The new scholarship requires a new epistemology. *Change* 27 (6): 26–34.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Schön, D. A., and J. L. Bennett. 1996. Reflective conversation with materials. In *Bringing Design to Software*, ed. T. Winograd, 171–189. Reading, MA: Addison-Wesley.

Schön, D. A., and M. Rein. 1994. *Frame Reflection: Toward the Resolution of Intractable Policy Controversies*. New York: Basic Books.

Schumpeter, J. (1942) 1975. *Capitalism, Socialism, and Democracy*. New York: Harper.

Schutz, A. 1953. Common-sense and scientific interpretation in human action. *Philosophy and Phenomenological Research* 14:1–38.

Scott, W. R. 2001. *Institutions and Organizations*. Thousand Oaks: Sage.

Scott Poole, M., A. H. de Ven, and K. Dooley. 2000. *Organizational Change and Innovation Processes: Theory and Methods for Research*. New York: Oxford University Press.

Scribner, S. 1984. Studying working intelligence. In *Everyday Cognition: Its Development in Social Context*, ed. B. Rogoff and J. Lave, 9–40. Cambridge, MA: Harvard University Press.

Scribner, S. 1986. Thinking in action: Some characteristics of practical thought. In *Practical Intelligence: Nature and Origins of Competence in the Everyday World*, ed. R. J. Sternberg and R. K. Wagner, 13–30. Cambridge: Cambridge University Press.

Scribner, S. 1997. *Mind and Social Practice: Selected Writings of Sylvia Scribne*, ed. E. Tobach, R. J. Falmagne, M. Brown Parlee, L. M. W. Martin, and A. Scribner Kapelman. Cambridge: Cambridge University Press.

Shannon, C. E., and W. Weaver. 1949. *A Mathematical Theory of Communication*. Urbana: University of Illinois Press.

Simon, H. A. 1955. A behavioral model of rational choice. *Quarterly Journal of Economics* 69:99–118.

Simon, H. A. 1969. *The Sciences of the Artificial*. Cambridge, MA: MIT Press.

Sorensen, C., and D. Pica. 2005. Tales from the police: Rhythms of interaction with mobile technologies. *Information and Organization* 15 (2): 125–149.

Starbuck, W. H. 1985. Acting first and thinking later. In *Organizational Strategy and Change*, ed. J. M. Pennings. San Francisco: Jossey-Bass.

Stengers, I. 2010. Introductory notes to an ecology of practices. *Cultic Studies Review* 11 (1): 183–196.

Sternberg, R. J., and J. A. Horwath, eds. 1999. *Tacit Knowledge in Professional Practice: Researcher and Practitioner Perspectives*. New York: Erlbaum.

Sternberg, R. J., and R. K. Wagner, eds. 1986. *Practical Intelligence: Nature and Origins of Competence in the Everyday World*. Cambridge: Cambridge University Press.

Sturken, M., and L. Cartwright. 2001. *Practices of Looking: An Introduction to Visual Culture*. New York: Oxford University Press.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

Suchman, L. 2011. Practice and its overflows: Reflections on order and mess. *TECNOSCIENZA: Italian Journal of Science and Technology Studies* 2 (1): 21–30.

Suchman, L. A., and R. H. Trigg. 1991. Understanding practice: Video as a medium for reflection and design. In *Design at Work: Cooperative Design of Computer Systems*, ed. J. Greenbaum and M. Kyng, 65–89. Hillsdale, NJ: Erlbaum.

Thévenot, L. 2001. Pragmatic regimes governing the engagement with the world. In *The Practice Turn in Contemporary Theory*, ed. K. Knorr Cetina, T. Schatzki, and E. von Savigny, 56–73. London: Routledge.

Thomson, R., L. Plumridge, and J. Holland. 2003. Editorial: Longitudinal qualitative research—a developing methodology. *International Journal of Social Research Methodology* 6 (3): 185–187.

Thorburn, D., and H. Jenkins. 2003. Introduction: Towards an aesthetic of transition. In *Rethinking Media Change: The Aesthetics of Transition*, ed. D. Thorburn, 1–16. Cambridge, MA: MIT Press.

Tolstoy, L. 1982. *War and Peace*. London: Penguin Books.

Tomasi di Lampedusa, G. 1958. *Il gattopardo*. Milan: Feltrinelli.

Tsoukas, H., and R. Chia. 2002. On organizational becoming: Rethinking organizational change. *Organization Science* 13 (5): 567–582.

Turkle, S. 1984. *The Second Self: Computers and the Human Spirit*. New York: Simon & Schuster.

Turkle, S., and D. A. Schön. 1988. Project Athena at MIT: An overview. http://simson.net/ref/1988/Turkle_Project_Athena.pdf.

Unger, R. M. 1987. *False Necessity*. Cambridge: Cambridge University Press.

Vaast, E., and G. Walsham. 2005. Representations and actions: Transformation of work practices with IT use. *Information and Organization* 15:65–89.

Van Maanen, J. 1979. *Tales of the Field: On Writing Ethnography*. Chicago: Chicago University Press.

Varela, F. E. 1994. Cognitive science in a new key: The enactive perspective. Speech given at Stanford University, March 10.

Varela, F. E., E. Thompson, and E. Rosch. 1991. *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: MIT Press.

Veyne, P. 1972. *Comment on écrit l'histoire*. Paris: Editions du Seuil. (English translation: *Writing History*, 1984.)

Vickers, G. 1965. *The Art of Judgment: A Study of Policy Making*. New York: Basic Books.

von Foerster, H. 1981. Notes for an epistemology of living things. In *Observing Systems: Collected Papers of Heinz von Foerster*, 258–271. The Systems Inquiry Series. Seaside, CA: Intersystems Publications.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024

von Foerster, H. 2002. *Understanding Understanding: Essays on Cybernetics and Cognition*. Berlin: Springer.

von Ranke, L. 1973. Preface: Histories of Romance and Germanic peoples. In *The Varieties of History*: *From Voltaire to the Present Times*, ed. Fritz Stern, 54–62. New York: Vintage Books.

Vygotsky, L. 1962. *Thought and Language*. Cambridge, MA: MIT Press.

Vygotsky, L. 1978. *Mind in Society*. Cambridge, MA: Harvard University Press.

Weick, K. E. 1987. Perspectives on action in organizations.In *Handbook of Organizational Behavior*, ed. J. W. Lorsch, 10–28. Englewood Cliffs, NJ: Prentice Hall.

Weick, K. E. 1989. Theory construction as disciplined imagination. *Academy of Management Review* 14 (4): 516–531.

Weick, K. E. 1993 a. The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly* 38:638–652.

Weick, K. E. 1993 b. Organizational re-design as improvisation. In *Organizational Change and Redesign*, ed. G. P. Huber and W. H. Glick, 346–379. New York: Oxford University Press.

Weick, K. E. 1995. *Sensemaking in Organizations*. Thousand Oaks, CA: Sage.

Weick, K. E. 1998. Improvisation as a mindset for organizational analysis. *Organization Science* 9 (5): 343–355.

Wenger, E. 1998. *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.

Winnicott, D. W. 1953. Transitional objects and transitional phenomena: A study of the first not-me possession. *International Journal of Psychonalysis* 34:89–97.

Wittgenstein, L. 1953. *Philosophical Investigations*. Oxford: Blackwell.

Yanow, D., and H. Tsoukas. 2009. What is reflection in action? A phenomenological account. *Journal of Management Studies* 46 (8): 1339–1364.

Zuboff, S. 1988. *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

Downloaded from http://direct.mit.edu/books/monograph/3490/bookpreview-pdf/2348180 by guest on 30 May 2024