

# Contents

Preface	xiii
Genealogy	xvii
Acknowledgments	xxiii

## Introduction 1

## 1 The Embedding of the Foundational in the Ad Hoc 13

1.1 Introduction: The Nature of Modern Technology	13
1.1.1 <i>Mediation as Revealing and Hiding</i>	17
1.1.2 <i>Modern Devices as Enabling Mediation Phenomena</i>	19
1.1.3 <i>Construing Device-Based Mediation Processes</i>	21
1.2 Search: A Significant Phenomenon of Mediation	24
1.2.1 <i>Conceptions of Search</i>	24
1.2.2 <i>A Semantic Conception of Search: Search as Meaning-Generating and Meaning-Suggesting</i>	27
1.2.3 <i>Search as Presupposed</i>	34
1.3 Studying the Semantic Conception of Search: Information Retrieval and Science (IR&S)	37
1.3.1 <i>Structuring Phenomena around Ad Hoc Search</i>	42
1.3.2 <i>Structuring Information Retrieval Research around Ad Hoc Research</i>	46
1.4 The Modern Trend Away from Ad Hoc Research	63
1.4.1 <i>The Foundational in Ad Hoc Information Retrieval Research</i>	64
1.4.2 <i>The Foundational in Information Science Research</i>	66
1.5 Foundations Research	67
1.5.1 <i>Fieldwide Questions and Their Modern Relevance</i>	68
1.5.2 <i>Making Foundations Research Explicit</i>	70
1.6 Conclusion	73

## 2 Notions of Progress in Information Retrieval 77

2.1 Introduction	77
2.2 Integrating Approaches (Internal Coherence)	81

2.3 Capturing Users and Context (Effective Construal and Objectification)	85
2.3.1 What Is Construal?	87
2.3.2 Construal as Pre-Theoretical, Culturally Informed, and Nontechnical	89
2.3.3 Construal Problems in Experimental IR	91
2.3.4 Construing Search	99
2.3.5 Construal and Foundations	105
2.4 Exploring Links with Other Fields (External Coherence)	109
2.4.1 External Coherence Requires Metatheory	111
2.4.2 External Coherence and Foundations Discourse	113
2.5 Notions of Progress (or Values) Pertaining to Evaluation	115
2.5.1 Emerging Phenomena Imply Changing the Space of Values and Rethinking Evaluation	118
2.5.2 Explanatory Evaluation Programs and the Value of Explanation	125
2.5.3 Useful Differences and Statistical Significance	131
2.5.4 Generalizability	132
2.5.5 Result Stability	135
2.6 Rank Improvement, Theory Growth, and Progress	139
2.7 Conclusion	140
<b>3 From Growth to Progress I: Methodology for Understanding Progress</b>	<b>141</b>
3.1 Introduction: Can IR&S Be Analyzed Using Ideas from the History and Philosophy of Science?	141
3.2 Appraising Science by Historical Analyses	143
3.3.1 This Work as a Rational Reconstruction	145
3.3.2 Adopting the Basic Structure of an Internal History	147
3.3.3 From "What Is Progress?" to "What Could Progress Mean?"	149
3.3 External Histories: Understanding Socio-Technical Change	150
3.3.1 Foucauldian Methodology for External Histories	152
3.3.2 Critical Theory and External History	153
3.3.3 External Historical Analyses in Service of Foundations Research	154
3.3.4 Modern Application Contexts Demand Serious External Historical Analysis	156
3.3.5 From External to Internal History and Scientific Progress	157
3.4 Internal Histories: Understanding Scientific Change	158
3.4.1 Prior Work on Understanding Scientific Change in IR&S	160
3.4.2 Brookes's Kuhnian Picture of Scientific Development in IR&S	164
3.4.3 Theories of Scientific Change	170
3.4.4 From Theories to Propositions	183
3.5 Conclusion	184

<b>4 From Growth to Progress II: The Network of Discourse</b>	<b>187</b>
4.1 Introduction	187
4.2 Applying Lakatos outside the Natural Sciences	188
4.3 Lakatos's Methodology for Appraising Research Programs	189
4.3.1 Lakatos's Change Narrative in Detail	190
4.4 Modifying Lakatos's MSRP for IR&S	193
4.4.1 From Facts to Propositions	194
4.4.2 Adjusting Mereology	195
4.4.3 Adjusting Research Goals	199
4.4.4 Adjusting How Successive Constructs Are Compared	201
4.4.5 Expanding the Notion of Progressive Change	202
4.4.6 Adjusting Types of Degenerative States	204
4.5 Progressive Growth as Coordinated and Coherent	205
4.6 Conclusion	207
<b>5 Basic Questions Characterizing Foundations Discourse</b>	<b>211</b>
5.1 Introduction	211
5.1.1 Categories of Foundations Questions: Disciplinary versus Compartment Questions	214
5.1.2 Properties of the Foundations Network: Its Purpose, Use, and Complementary Research Culture	219
5.1.3 Structure of This Chapter	221
5.2 Questions Pertaining to the Discipline and Discourse	222
5.2.1 Received Identities for IR and IS	223
5.2.2 What Kind of Science Can IR&S Be, If It Can Be a Science at All?	227
5.2.3 Identity and the Concept of Information	228
5.2.4 Identity through Ethics and Craft	230
5.2.5 Identity and the Growing Space of Values	232
5.3 Questions about Compartment toward Specific Entities or Relations	234
5.3.1 Different Levels of Phenomena	235
5.3.2 Adopting a Causal Theory of Technology	242
5.3.3 What Is a User? User as Embodied-Embedded Being	246
5.3.4 What Are Information Needs? Information Needs and Final and Efficient Causes	252
5.3.5 What Is a Query? Query as Formal Cause	254
5.3.6 What Is a System? System as Material Cause	259
5.3.7 What Is a Document? Document as Experienced	263
5.3.8 What Is Relevance?	272
5.3.9 What Is Context?	274
5.3.10 What Is a Collection?	276
5.4 General Issues Pertaining to Compartment	279
5.4.1 From Foundations to Nonfoundations	281
5.4.2 Observational Contexts	283

5.4.3 Explanatory Strategies	286
5.4.4 Coordinated Theory Growth	289
5.5 Conclusion	293

## **6 The Enduring Nature of Foundations 295**

6.1 Introduction	295
6.2 Prior Foundations Research	298
6.3 Foundations and the Present	302
6.3.1 Modern Foundational Works in IS	303
6.3.2 Foundations Texts in IR as Mathematical Foundations	306
6.3.3 The Place of This Work among Present Works	306
6.4 Future of Foundations I: The Requirement of Integrating IR and IS	307
6.5 Future of Foundations II: A New Kind of Science?	311
6.5.1 Why a "Science of Technology-Mediated Experience"?	311
6.5.2 Neither a Science of the Artificial nor a Subdiscipline of Cultural Studies	313
6.5.3 The Craft of STME as a Memory Craft	316
6.5.4 The Scientific-Explanatory Aspect of a STME	326
6.6 Conclusion	339

## **7 Foundations as the Way to the Authoritative against the Authoritarian: A Conclusion 341**

7.1 Introduction	341
7.2 Foundations as Characterizing the World Picture of IR&S	343
7.3 Implications for an IR&S Discourse with and without Foundations	347
7.3.1 Lack of Authoritative Discourse	348
7.3.2 Dissolution of the Discipline	349
7.3.3 Breakdown of Institutions	349
7.4 Conclusion	350

References	351
------------	-----

Index	385
-------	-----