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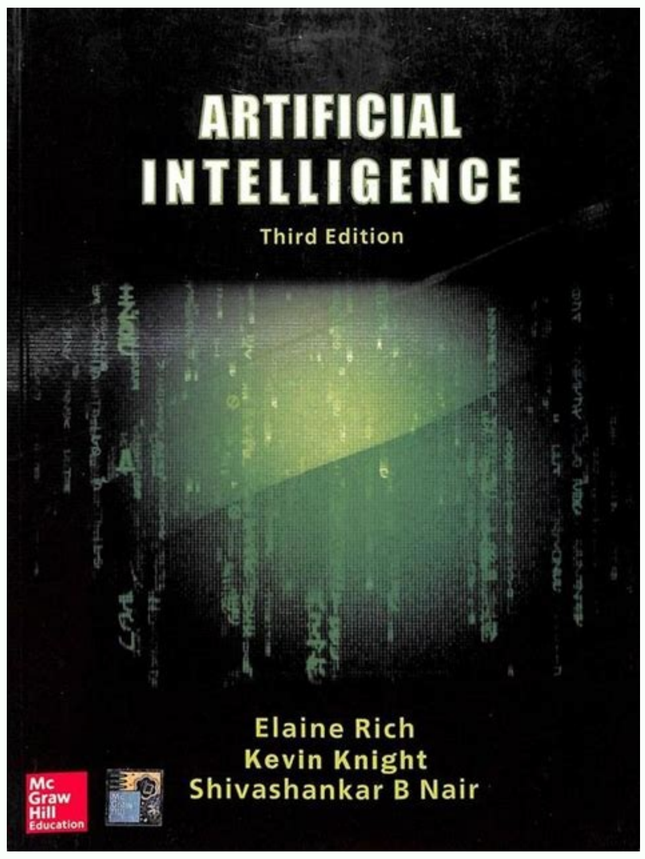

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Four NEW chapters on self-organizing systems, holistic thinking, operational thinking, and design thinkingCovers the recent crises in financial systems and job markets globally, the housing bubble, and the environment, assessing their impact on systems thinkingCompanion website to accompany the book is available at interactdesign.com Table of Content Contents Foreword to Second Edition xv Preface xvii Acknowledgments xix PART I Systems Philosophy: The Name of the Devil 1 Chapter 1 How the Game Is Evolving 3 Imitation 4 Inertia 5 Suboptimization 6 Change of the Game 6 Shift of Paradigm 8 Interdependency and Choice 9 On the Nature of Organization: The First Paradigm Shift 10 Mindless Systems: A Mechanistic View 10 Uniminded Systems: A Biological View 11 Multiminded Systems: A Sociocultural View 12 On the Nature of Inquiry: The Second Paradigm Shift 13 The Competitive Games 16 Mass Production: Interchangeability of Parts and Labor 17 Divisional Structure: Managing Growth and Diversity 18 Participative Management: Self-Organizing Systems 20 Operations Research: Joint Optimization 21 Lean Production Systems: Flexibility and Control 22 Interactive Management: The Design Approach 22 vii PART II Systems Theories: The Nature of the Beast 25 Chapter 2 Systems Principles 29 Openness 30 Purposefulness 33 Multidimensionality 38 Plurality of Function, Structure, and Process 43 Emergent Property 45 Counterintuitiveness 49 Chapter 3 Systems Dimensions 56 Throughput 59 Model of the Process 60 Critical Properties 63 Measurement and Diagnostic 64 Read-Only Memory 65 Target Costing 65 Membership 66 Conflict Management 67 From Lose/Lose to Win/Win Environments 70 Changing Conflict to Competition 70 Decision Systems 71 Duplication of Power 71 Decision Criteria 73 Learning and Control Systems 75 Social Calculus 77 Chapter 4 The Sociocultural Model: Information-Bonded Systems 83 Culture 84 Social Learning 87 Development 88 Schematic View of Theoretical Traditions 89 Systems View of Development 92 Obstruction to Development 96 Recap 103 viii Systems Thinking: Managing Chaos and Complexity PART III Systems Methodology: The Logic of the Madness 105 Chapter 5 Systems Methodology 107 Foundation 1: Holistic Thinking 108 Structure, Function, Process, and Context 108 Foundation 2: Operational Thinking 114 Understanding Chaos and Complexity 114 Understanding the Multi-loop Nonlinear Feedback System 117 Mapping the Dynamic Behavior 118 Foundation 3: Self-Organization 121 Socio-Cultural Model 121 Foundation 4: Interactive Design 125 Defining Problems (Formulation of the Mess) 126 Designing a Solution (Idealization and Realization) 128 Conclusion 130 Chapter 6 Defining the Problem 131 Formulating the Mess 131 Searching 132 Mapping the Mess 135 Telling the Story 140 Mapping the Mess of XYZ Corporation, a Sample Formulation 140 Chapter 7 Designing Business Architecture 152 Multidimensional Modular Design 152 The System’s Boundary and Business Environment 153 Purpose 156 Functions 161 Structure 163 Outputs Dimension 165 Inputs Dimension 167 Markets Dimension 169 Internal Market Economy 170 Processes 174 Planning, Learning and Control System 175 Measurement System 176 Contents ix Realization: Successive Approximation 181 Type I Constraints 181 Type II Constraints 183 Type III Constraints 183 Dissolving the Second-Order Machine 183 Recap 184 PART IV Systems Practice: The Gutsy Few 185 Chapter 8 The Oneida Nation 187 Desired Specifications 187 Systems Architecture 189 Governance 190 Governing Body 192 Chief of Staff 192 Planning, Learning, and Control System 192 Planning, Learning, and Control Board 194 Membership Systems 195 Empowerment 195 The Tie that Bonds 196 Membership Network 196 Consensus-Building Process 198 Back to the Future 201 Performance Criteria and Measures 202 Learning Systems 203 Learning to Learn (Formal Education) 205 Learning to Be (Cultural Education) 205 Learning to Do (Professional Education) 206 Support Functions 206 Advocacy Functions 207 Oneida Multiversity 207 Performance Criteria and Measures 210 Business Systems 211 Services Sector 212 Industry Sector 213 Leisure Sector 213 Land and Agriculture Sector 213 Marketing Sector 213 Governance and Intersystems Relationships 214 Core Services 215 Government Services Division 215 Infrastructure Development Division 215 Ordinance Division 216 Performance Criteria and Measures 216 Governance and Oversight 216 x Systems Thinking: Managing Chaos and Complexity External Environment 217 Judicial System 218 Contextual Analysis 218 Contextual Challenge 219 Democratic Challenge 220 Chapter 9 Butterworth Health Systems 222 Issues, Concerns, and Expectations 223 Design Specifications 225 The Architecture 226 Market Dimension 227 Market Access 227 Care System 229 Contextual Background 229 Desired Specifications 229 Common Features 231 Preventive Care 233 Interventional Care 234 Viability Care 234 Terminal Care 235 Output Dimension 237 Health Delivery System Design: The Makeup 240 Community-Based Health Delivery System 240 Specialized Health Delivery System 242 Shared Services 243 Core Knowledge 245 Shared Services 249 Need for Centralization 250 Control versus Service 251 Customer Orientation 251 Health Delivery System, Core Knowledge, and Care Systems Interactions 253 The Executive Office 257 Recap 258 Chapter 10 The Marriott Corporation 260 The Environment: How the Game Is Evolving 261 Bases for Competition 261 Purpose 262 Principles and Desired Characteristics 262 The Architecture 263 Product/Market Mix 264 Region/Market Operation 264 Brand Management 266 Core Components 266 Contents xi Core Knowledge 267 Critical Processes 268 Recap 269 Chapter 11 Commonwealth Energy Systems 270 Stakeholders’ Expectations 271 Shareholders’ Expectations 271 Regulators’ Expectations 272 Employees’ Expectations 272 Customers’ Expectations 272 Suppliers’ Expectations 273 Public’s Expectations 273 Business Environment 273 The Changing Game: The Energy Industry 273 The Changing Game: COM/Energy 275 Design 276 Purpose and Strategic Intent 276 Core Values and Desired Specifications 278 General Architecture 279 Core Business Units: Gas and Electricity Distribution 282 Customer-Oriented Business Units: Energy Supply Systems and Management Services 283 Cogeneration and Packages of Energy Supply (Industrial and Commercial) 283 Energy Efficiency and Electrotechnologies (Residential and Commercial) 285 Technology/Supply-Oriented Business Units: Energy Generation and Supply 286 Energy Generation (Canal) 286 Gas Storage (LNG) 287 Steam Services 288 Energy Brokerage and International Operations 288 Energy Brokerage 288 International Operations 289 Shared Services (Performance Centers) 290 Service Company 291 Financial Systems 292 Executive Office 292 Core Knowledge Pool 293 Learning and Control System 294 Chapter 12 Carrier Corporation 297 Expectations, Assumptions, and Specifications 298 The Changing Game: In General 298 The Changing Game: The HVAC Industry 299 xii Systems Thinking: Managing Chaos and Complexity Drivers for Change 299 Bases for Competition 299 Core Values 300 Products and Services 300 Core Technology and Know-How 301 Sales and Distribution System 302 Systems Architecture 303 Desired Characteristics 303 A Multidimensional Framework 304 Markets 304 Regional Units 305 Area Units 307 Output Units 307 Components 309 Inputs 310 The Technology 310 Operational Support (Process Design) 310 Management Support Services 311 Business Processes 312 Decision System 312 Performance Measurement and Reward System 312 Target Costing and Variable Budgeting System 312 Conclusion 315 Bibliography 319 Index 325 Foreword: Systems Thinking: Managing Chaos and Complexity Professor Thomas Lee of MIT was a dear friend. I met him in the early 1980s when he was the Secretary General of the International Institute for Applied Systems Analysis (IIASA). Tom was obsessed with the notion that two distinct traditions of systems thinking—Ackoff’s interactive design and Forrester’s systems dynamics—are complementary. For years he insisted that we should work together to merge the two prominent systems methodologies into a single unified one. But at the time I was preoccupied with two other exciting conceptions. The first one was consideration of culture as an operating system that guides social organizations toward a predefined order. The second was a hunch that iteration is the key for understanding complexity. Sadly, Tom passed away, but managed to get a promise from me to work on his favorite project. To fulfill my promise I tried several different approaches, all in vain, before realizing that I had the solution all along. In fact I had used it in the first edition of the present work to combine my version of holistic thinking— iteration of structure, function, and process—with Interactive design. Suddenly it became clear that Interactive Design is not just a simple methodology. It is also a platform that could be used to integrate the iterative approach, systems dynamics, and the challenge of self-organization of sociocultural systems (neg-entropic process) into a comprehensive systems methodology. I prepared a draft of my thinking and showed it to my mentor Russ Ackoff. He liked it very much and insisted that I should publish it in a new book. Coincidentally, at that time, Dean Thomas Manahan of Villanova University and Niel Sicherman, Associate Dean of Executive Education, asked me to help them design a distinctive Executive MBA program that would use systems thinking as a platform to integrate the relevant subjects into a unified whole. I was ready for this assignment. The systems methodology I had developed was uniquely qualified to deal with the challenge that most MBA programs have not been able to deliver. Four successful classes of Villanova Executive MBA graduates are testimony for the effectiveness of this approach. When Dennis McGonagle, my editor from Elsevier, called to see whether I was ready for a new edition, I welcomed the opportunity to revise chapters 4, 5, 6, and 7 of the present work to incorporate this exciting concept. xv But, in the end, it was the remarkable support of my valued partner Susan Leddick that got the job done. Susan not only edited the revised chapters with utmost attention but also had many invaluable suggestions that improved the outcome significantly. Here it is, my new version of a comprehensive systems methodology. I sincerely believe that the beauty of interactive design and the magic of the iteration of structure, function, and process—when combined with the power of operational thinking, and genuine understanding of neg-entropic processes—create a competent and exciting systems methodology that goes a long way in dealing with emerging challenges of seemingly complex and chaotic sociocultural systems. Jamshid Gharajedaghi Preface: Systems Thinking: Managing Chaos and Complexity This is an unconventional book for an unconventional reader. It is intended for those professionals who, in addition to their specialized knowledge, would like to get a handle on life so they may put their special text into its proper context. It speaks to those thinkers and practitioners who have come to realize that learning to be is as much a necessary part of a successful professional life as is the learning to do; and that to remain unidimensional is to become boringly predictable. This book is about a new mode of seeing, doing, and being in the world; a way of thinking through chaos and complexity. It is not another “how to” book, nor an alternative to what is already available. It is not a variation on the tired theme of offering the latest version of the common characteristics of the winners. It also violates the golden rule of best sellers. I am told the experience of dealing with too many ideas in a single book is way out of the comfort zone of most readers, but given the choice between breaking the message or breaking the norm, it was obvious which one had to go. If that meant being a minority of one, so be it. The ideas in this book, although many, converge and create a whole that is profoundly more beautiful than any one concept in isolation. The real beauty, therefore, lies in experiencing the whole, seeing the concepts all fuse into one. The book, nevertheless, speaks to everyone for whom the joy of thinking is still alive and kicking and whose enthusiasm to entertain exciting but unfamiliar conceptions is not yet exhausted. In a nutshell, the book is about systems. The imperatives of interdependency, the necessity of reducing endless complexities, and the need to produce manageable simplicities require a workable systems methodology and a holistic frame of reference that will allow us to focus on the relevant issues and avoid the endless search for more details while drowning in proliferating useless information. Contrary to widely held belief, the popular notion of a multidisciplinary approach is not a systems approach. The ability to synthesize separate findings into a coherent whole seems far more critical than the ability to generate information from different perspectives. This book, with a practical orientation xvii and yet a profound theoretical depth, goes beyond the simple declaration of the desirability of systems thinking. It deals with the challenges of interdependency, chaos, and choice using an elaborate scheme called iterative design. The iterative design explicitly recognizes that choice is at the heart of human development. Development is the capacity to choose; design is a vehicle for enhancement of choice and holistic thinking. Designers, in this book, seek to choose rather than predict the future. They try to understand rational, emotional, and cultural dimensions of choice and to produce a design that satisfies a multitude of functions. They learn how to use what they already know, how to realize what they do not know, and how to learn what they need to know. The book is divided into four parts. Part I identifies where systems thinking fits into the overall scheme of things. It provides an overview, a total picture of major theoretical traditions in management and systems thinking and their relationship. Parts II and III are the guts of the book. Part II discusses the five systems principles as the building blocks of the mental model used to generate the initial set of assumptions about the system. It also identifies the comprehensive set of variables that collectively describe the organization in its totality. Part III deals extensively with the development of iterative design and its practical implications in defining problems and designing solutions. Part IV reviews five actual cases of designing a business architecture. The Oneida Nation, Butterworth Health Systems, the Marriott Corporation, Commonwealth Energy Systems, and Carrier Corporation represent a diverse group of challenging social organizations. I call them “the gutsy few” because they were willing to experiment with unconventional solutions without worrying about who had done it first. I am grateful for their trust and permission to share synopses of their designs with others. Acknowledgments A lifetime of teaching and consulting involves indebtedness to innumerable sources of wisdom. I have learned from my students and clients far more than I ever taught them. Looking back, I can hardly even begin to recall the fires by which I was warmed, the lights by which I found my way. And yet there are faces that vividly stand out. To them, thankful acknowledgment is in order. First and foremost is Bijan Khorram. It is almost impossible to separate him from so much that is here. As a friend and colleague of over three decades, the effect of his thinking on me knows no bounds. He acted as the sounding board to examine the soundness of ideas and the potency of their configurations. He directly collaborated in the redesigns and write-ups of the cases presented under Systems Practice. Stylistically, his influence permeated the entire exercise. Russell L. Ackoff has been my mentor, partner, and a great friend. He was there, as always, with his infinite wisdom and uncompromising critique to examine every line and dissect every concept of the manuscript. I welcomed his measured views and took most of his recommendations. Johnny Pourdehnad’s insatiable love of searching was a blessing. With him around, access to valuable resources was fun rather than an obstruction. Jason Magidson helped with graphics. Pat Brandt and Tina Fellenbaum provided the logistical support. Pat Egner did the editing; the Anglicized version is indebted to her efforts. There were, of course, those who discovered the pony in what I had to say. Professors Gerry Wilson and Tommy Lee, Dean Pat Stocker, Kathy Dannemiller, Martine Dodds, Carol and David Schwinn, Susan Leddick, Bill Roth, and March Jacques just kept cheering me on. Then there were the special clients whose patronage, courage, and intellectual challenge in bringing the conceptual ideas to concrete fruition proved invaluable indeed. Charlie Ligon, Karl J. Krapek, Len Devanna and Artley Skenandore, with their unfailing trust, turned out to be the difference that made the difference. Last but not least is Karen Speerstra, Publishing Director of ButterworthHeinemann, who, with remarkable decisiveness, got the project rolling. March Jacques proved to be a fantastic matchmaker. My gratitude to them all will remain a debt I can never repay. Book Review by Jovita Nsoh I will be brief with my review. Brief because this book forced me to think and introduces new paradigms in my routine. The key learning here is that as Engineers, we should always trade places with our customers and that we should adopt user-centric approaches to systems development. The long narratives in the book could put the shortened attention reader to sleep and intimidate the weak at heart. But, there’s a lot of wisdom hidden even in those sections. A second reading should reveal them. His discussion of “Holon” and Multi-minded systems as the foundation for socio-cultural systems was a visionary one, and exposed one reality: That platforms such as Facebook and Twitter were possible even as far back as the 1960’s if Engineers had changed their perspectives and embraced multi-mindedness as a design paradigm. This book should be read alongside “The Ghost in the Machine (Arkana) by Arthur Koestler (Jun 5, 1990)”. Jovita Nsoh, CISM, CISSP, CITA-PSenior Security ArchitectMicrosoftSeattle, WA Editorial Reviews Review “Einstein once wrote, “Without changing our pattern of thought, we will not be able to solve the problems we created with our current patterns of thought.” Jamshid develops a pattern of thought that will yield solutions to those problems.” –Russell Ackoff, Professor Emeritus, The Wharton School, University of Pennsylvania “Gharajedaghi challenged us to think backwards from an ideal competitive position instead of forwards from our existing position with all its constraints. The result was bolder thinking about change. Jamshid forces a realistic assessment of a company’s strengths and weaknesses, an idealistic view of what it could be, and creates the path from point A to point B.” —Bill Tiefel, President, Marriott Lodging “Gharajedaghi was perfect! He had passion and brilliance. He could challenge our traditional thinking and make us see our actions and opportunities from a different perspective.” —William G. Poist, President and CEO, Commonwealth Energy System “This volume on business management explores the development of complex systems and advocates for iterative design principles as a foundational philosophy for dealing with complex, chaotic systems. The volume discusses system theory and changes to traditional paradigms in light of emerging technologies and business methodologies and explores case studies from industry leaders that showcase these systems philosophies.” –SciTech Book News We also Recommend Originally published: 1999 Author: Jamshid Gharajedaghi Download Systems Thinking: Managing Chaos and Complexity

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