

General Principles of Systems Design

"What the book is good at . . . is the explanation of imaginative approaches to the organization of systems (of humans or of machines)."

—Datamation

"The authors combine the views of their disciplines and look at larger issues such as the interplay between systems and people, the abstract and concrete, and the theoretical and practical. . . . The authors' style is light and sometimes humorous with a large number of quotations from literature. . . . Never dull . . . the book bears evidence of a global view in which systems design is a means of organizing ideas, structures, things, and experience."

—Ann E. Prentice

Library and Information Science Annual

"This book is the result of an 18-year collaboration between two people, in two different disciplines, who share a fascination and love for the human animal. Whether from the vantage point of computers or anthropology, we are excited by the capacities of the human mind and alarmed by some of its products. . . . Both our disciplines daily come to grips with the subtle interplay between system and environment. Cultures and computers both exhibit the effects of adaptation to a constantly changing environment."

—from the preface

About the Authors



Gerald Weinberg is co-principal with his wife, Daniela, of Weinberg and Weinberg, a consulting firm that trains people in improved productivity, organizational development, and problem solving.

Daniela Weinberg has consulted, published, and lectured extensively on organizational cultures, both how they work and how they change. Drawing on her expertise in applied anthropology, she holds workshops on the human-canine relationship. She is a staff writer for the dog-obedience journal *FORWARD*, winner of the prestigious Maxwell Award in 1998 and 1999.



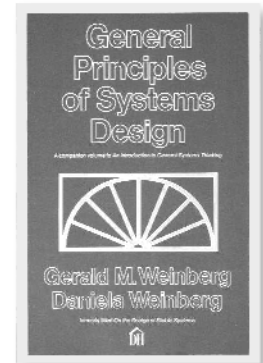
Partial Contents

- 1: The Problem of Persistence**
Weinberg's Law(s) of Twins • The General Systems Approach to Continuity
- 2: Aggregates**
Births and Deaths—The Fundamental Aggregate Equation
- 3: Birth-Free Aggregates**
Social Versus Innate Survival • Exponential Decay • Unimodal Life Tables, and Ogives
- 4: Reasoning About Aggregates**
Cooperation and Competition—The Law of Collapse • The Law of Typology
- 5: Modeling Differentiated Aggregates**
The State Vector • Constructing a System of Equations • To Solve or Not To Solve?
- 6: Programs for Models of Differentiated Aggregates**
Varieties of Programs • Transitive Closure—The Diagram of Possible Effects
- 7: Structure and Behavior**
The Structure of Structure • Projecting Behavior with a Linear Program
- 8: The Structure-Regulation Law**
The Equivalence of Structure and Input • Can a Linear System Be Stable?
- 9: The Search for Regulation**
The Problem of Multidimensional Regulation • Separation of Variables
- 10: The Homeostatic Heuristics**
The Internal Environment • Identifying and Essential Variables
- 11: Other Regulatory Heuristics**
The Feedback Principle • Analyzing Feedback Loops • The Piddling Principle
- 12: Types of Regulatory Mechanisms**
Conditional and Unconditional Mechanisms • Error-Control • Anticipation
- 13: Regulation and Environment**
Acting on the Environment • The Environment Regulation Laws • The Regulatory Model • The Game of Regulation
- 14: When the Model Fails**
The Fundamental Regulator Paradox • Noise • Noise in Communication Systems
- 15: Making Regulation Mysterious**
The Impression of Intelligence • The Myth of Superiority
- 16: Overly Simple Views of Regulation**
The Kool-Aid Fallacy and the Aspirin Illusion • The False-Alarm Fallacy • Flareback
- 17: Blindness and Reversed Vision**
Hidden Reverses • Denying the Existence of Regulation
- 18: Epilogue**

General Principles of Systems Design

by Gerald M. Weinberg and Daniela Weinberg

Bring a Deeper Understanding of Systems to Software and System Development



ISBN: 978-0-932633-07-1
©1988 376 pages softcover
\$33.95 (includes \$6 UPS in US)

Originally titled *On the Design of Stable Systems* in its first, hardcover incarnation, in 1979, *General Principles of Systems Design* does not just focus on computer systems, but systems of all kinds—human, natural, and technological.

In a highly readable, original presentation that embraces everything from depletion curves to the Feedback Principle (the method of controlling a system by reinserting it into the results of its past performance), the Weinbergs explore the subtle art and science of regulating systems, projects, and people in the most efficient and logical manner possible.

The authors draw on their respective backgrounds in technology

and social science to offer fresh insights and translate them into a language that anyone can understand.

In the course of this presentation, the Weinbergs introduce a host of laws and theorems derived from the best thinking of systems thinkers over the past century.

In addition to being a reference book for professional and lay people alike, *General Principles of Systems Design* is suitable as an undergraduate text in the humanities, social, natural, and engineering sciences.

It is unique in its approach, highly readable, and offers practical ways of solving problems.

100+ figures

Read more about this book at
www.dorsethouse.com/books/gen.html