

## **contents**

prefaces to the second edition, 1992 by C. Thomas Mitchell and Timothy Emlyn Jones .....	ix
introduction to the first edition, 1970 .....	xviii
acknowledgements .....	xx
1980 edition: review of new topics .....	xxii
1992 edition: imaginary preludes .....	xxxix
 <b>PART 1 THE DEVELOPING DESIGN PROCESS .....</b> 1	
Chapter 1 <i>What is Designing?</i> .....	3
The Designer's Objectives .....	6
Why is Designing Difficult? .....	9
Is Designing an Art, a Science or a Form of Mathematics? .....	10
Chapter 2 <i>Traditional Methods</i> .....	15
Craft Evolution.....	15
Design-by-Drawing .....	20
Chapter 3 <i>The Need for New Methods</i> .....	27
Question 1: How do Traditional Designers Cope with Complexity? .....	28
Question 2: In What Ways are Modern Design Problems More Complicated than Traditional Ones?.....	30
Question 3: What are the Interpersonal Obstacles to Solving Modern Design Problems?.....	35
Question 4: Why are the New Kinds of Complexity Beyond the Scope of the Traditional Design Process?.....	41
Chapter 4 <i>The New Methods Reviewed</i> .....	45
Designers as Black Boxes.....	46
Designers as Glass Boxes.....	49
Designers as Self-Organizing Systems.....	54
Criteria for Design Project Control.....	57

<b>Chapter 5</b> <i>The Design Process Disintegrated</i> .....	61
Designing as a Three-Stage Process.....	63
1. Divergence .....	64
2. Transformation .....	66
3. Convergence.....	68
The Consequences of Disintegrating the Design Act.....	69
Prospects for the Reintegration of Designing.....	71
Callous Operationalism or Collective Insights?.....	72
<b>Chapter 6</b> <i>Choosing Strategies and Methods</i> .....	75
Design Strategies .....	75
Choosing Design Methods .....	79
Examples .....	83
<b>PART 2 DESIGN METHODS IN ACTION</b> .....	87
<b>Introduction to Part 2.</b> .....	89
<b>Section 1 PREFABRICATED STRATEGIES (Convergence)</b> .....	94
1.1 Systematic Search (The Decision Theory Approach).....	96
1.2 Value Analysis .....	106
1.3 Systems Engineering .....	116
1.4 Man-Machine System Designing.....	123
1.5 Boundary Searching.....	134
1.6 Page's Cumulative Strategy .....	149
1.7 CASA (Collaborative Strategy for Adaptable Architecture)	156
<b>Section 2 STRATEGY CONTROL</b> .....	168
2.1 Strategy Switching .....	170
2.2 Matchett's Fundamental Design Method (FDM).....	178
<b>Section 3 METHODS OF EXPLORING DESIGN SITUATIONS(Divergence)</b> 192	
3.1 Stating Objectives.....	194
3.2 Literature Searching.....	201
3.3 Searching for Visual Inconsistencies.....	209
3.4 Interviewing Users .....	214

3.5 Questionnaires .....	221
3.6 Investigating User Behaviour.....	235
3.7 Systemic Testing.....	246
3.8 Selecting Scales of Measurement.....	252
3.9 Data Logging and Data Reduction.....	259
<b>Section 4 METHODS OF SEARCHING FOR IDEAS (Divergence and Transformation).....</b>	<b>272</b>
4.1 Brainstorming .....	274
4.2 Synectics.....	278
4.3 Removing Mental Blocks.....	286
4.4 Morphological Charts.....	292
<b>Section 5 METHODS OF EXPLORING PROBLEM STRUCTURE (Transformation) .....</b>	<b>298</b>
5.1 Interaction Matrix .....	300
5.2 Interaction Net.....	304
5.3 AIDA (Analysis of Interconnected Decision Areas).....	310
5.4 System Transformation.....	316
5.5 Innovation by Boundary Shifting.....	325
5.6 Functional Innovation.....	331
5.7 Alexander's Method of Determining Components.....	341
5.8 Classification of Design Information.....	350
<b>Section 6 METHODS OF EVALUATION (Convergence).....</b>	<b>360</b>
6.1 Checklists .....	362
6.2 Selecting Criteria.....	371
6.3 Ranking and Weighting .....	377
6.4 Specification Writing.....	383
6.5 Quirk's Reliability Index.....	391
<b>REFERENCES AND INDEX OF AUTHORS.....</b>	<b>397</b>
<b>SUBJECT INDEX TO PART 1 .....</b>	<b>405</b>