CONTENTS

		FOREWORD
		PREFACE
		ACKNOWLEDGMENTS
Part I	A	NALYSIS AND DEFINITION
	1	THE BOSS
	2	DEFINING THE BUSINESS FUNCTION
		Identifying the Business Need 10 A System Prompted by Vague Corporate Needs 11, A System with Poorly Defined Users 12, A Tool Looking for a User 12, A Need Perceived by Outsiders 12, A User Unwilling to Pay 13, A Problem Not Solvable by Information 13
		Defining the Solution 17 Define the Reports 18, Define the Data Elements 18, Define the Data Sources 19, Define the Processing that Transforms the Data 19, Define the Data's Destination 20, Remember the Forgettable Functions 20, Get Technical: Diagram the System 23, Define System Operation and Volumes 38, Prototypes 38, Write the Business Function Definition 41
		Chapter Summary 41

xiii

ΧV

xviii

3	TOOL INVESTIGATIONS	43
	Hardware Tools 45 Basic Architecture 45, Microprocessor Speed 47, Memory 48, Disk Storage 49, Printers 51, Display Monitors 52	
	Software Tools 52 Development Tool Contrasts 53, Traditional Languages 55, Fourth-Generation Languages 57, Special-Purpose Packages 64	
	Software Issues 64 Build vs. Buy 64, Compilers vs. Interpreters 65, Source Code and Object Code 66, Suitability of Languages for Development 66, New Software Technologies 68	
	Chapter Summary 68	
4	THE MATCH	70
	Hardware Analysis 71 Display Monitors 71, Memory 71, Printers 71, Disk Drives 73, Microprocessor Speed 76, Overall Response Time 77	
	Communications Analysis 78 Software Packages: Async or Sync 78, Software Packages: File Transfer or Terminal Emulation 79, Modems 81, Networks 82, Fault Tolerance 84, Security 85	
	Software Analysis 85 Build or Buy 85, Bugs and Money 86, Application Profile 86, Expectation for System Change 88	
	Making the Match 89	
	Brand Selection 89	
	Meanwhile, Back at Poulet 92	
	Chapter Summary 92	
5	PROJECT MANAGEMENT	93
	Estimating Project Costs—The Easy Part 93 Hardware and Communications Costs 95, Distribution and Installation Costs 95, Training, Operations, and Support Costs 96, Software License and Maintenance Costs 97, Doing the Estimate—The Easy Part 98	

Estimating Project Costs and Schedules—The Hard Part 100 Software Development and Maintenance Costs 101, Estimating the Phases of Systems Development 105, A Closer Look at Realistic Estimating 108, Traditional vs. Fourth-Generation Development Time Frame Patterns 111, Alternate Means of Estimating 112, Estimating the Schedule 113, The Software Development Estimate and the Proverbial Grain of Salt 114, Phase-Based Confidence Levels 115	
Estimating Project Benefits 118	
Defining the Project 120 Defining the Mechanized Solution 120, The Implementation Sequence 120, The System and the Organization 121	
Planning the Resources 122 Developed Software and the Role of the Technical Manager 122	
Documenting the Project and Obtaining Funding and Approval 124	
Chapter Summary 125	
PART II CONSTRUCTION	127
6 BUSINESS DESIGN	127
User/System Dialogue Definitions 128 Report Selection Criteria 129, File Update Screen Dialogues 130, Operations Screen Dialogues 131, Menus 131, Reports 133, New Functions 133	
User/System Dialogue Design Guidelines 133 File Updating and Operations Functions 134, Menus 135, Reports 135, Formality vs. Cost 137	
Data Element Definitions 142 Data Elements 142, Keys 143, Normalization 146	
The Deliverables 150	
What's Changed Since the Project Definition 151	
Chapter Summary 152	
7 TECHNICAL DESIGN	154
The Physical Functions 155 The Rules of Structured Design 155, Detailed Structured English 161 Expection Specification Components 168	

	The Physical Files 169 Physical Access 169, Local and Global Variables 171, Security 172	
	The Deliverables 172	
	Coping with Technicians 176 Find an Expert 177, Make the Expert Explain 177, Judge the Expert 178, Act on the Advice 178	
	Project Management Issues 178 Reestimating the Project 178, Delegation and Control 182	
	Chapter Summary 182	
8	BUILDING THE SYSTEM	184
	Coding 184 Setup 184, Learning Time 186, The Coding Phase 188	
	Testing 189 Testing in General 189, Unit Testing 190, Debugging 195, Testing Aids 197, System Testing 197, Acceptance Testing 202	
	Meanwhile, Back at Poulet 202	
	Project Management Issues 204 Progress Management 204, Change Management 205, Crisis Management 207	
	Chapter Summary 208	
9	INSTALLATION AND MAINTENANCE	210
	Installation 211 Distribution and Installation 211, Training 211, Support 211	
	Maintenance 212 Requirements for Maintenance 212, Identifying the Business Function of the Change 213, Change Management 214, Business Design 214, Technical Design 215, Making and Testing the Change 216, Installation 216, Ongoing Concerns 216, Laying the System to Rest 218	
	Meanwhile, Back at Poulet 219	
	Chapter Summary 219	
	EPILOGUE	220

PART III	THE MARS CASE STUDY	223
i	MARS PROJECT DEFINITION	223
	Business Function Definition 226 Narrative Description 226, System Reports 228, Data Flow Diagrams 232, Data Dictionary 236, Process Descriptions 239, System Operation 246, System Volumes 247	
	Tool Selection and Rationale 248	
	Costs and Benefits 249	
	Project Plan 250	
	Risks 251	
	Funding 251	
ŗ	MARS BUSINESS DESIGN	253
	Screen and Report Images and Narratives 255	
	Data Dictionary 282 Files 282, Data Elements and Edits 284, File Accesses 286	
	User Manual (Draft) 288	
	Project Management Information 290	
ı	MARS TECHNICAL DESIGN	293
	System Design Description 295	
	Physical File Design 297	
	Function Descriptions 298	
	Project Management Information 324 MARS Implementation Plan 324, Costs 327	
PART IV	Appendices	329
	A1 COMPUTER AIDED SOFTWARE ENGINEERING (CASE)	329
	Analyst Workbenches 330, Application Code Generators 331	

	Expert Judgements 332, Knowledge Rules and Inference Rules 333, Backward Chaining and Forward Chaining 334, Development and Maintenance 335	
АЗ	COMMUNICATIONS TOOLS	336
	Communications Tools 337 File Transfer 337, Terminal Emulation 339, Terminal Emulation—Based File Transfer 341	
	Physical Transmission 342	
	Communications Tools: One More Look 343 Tool Features 344, Asynchronous Fault Tolerance 346	
	Networks 349 Basics 349, Switched vs. Dedicated 350, Value Added Networks (VANs) 350, Local Area Networks (LANs) 351	
	Standards and Compatibility 354 Physical Level 354, Protocol Level 355, Software Level 355	
	Summary 357	
A4	PHYSICAL TRANSMISSION	360
	Modems 361 Waves and Signals 361	
	Protocols 365 Synchronization 365, Async Protocol 367, Bisync Protocol 369, HDLC/SDLC Protocol 371	
	Summary 372	
A5	BIBLIOGRAPHY	373
	INDEX	377

A2 EXPERT SYSTEMS

332