

Process Development Life Cycle: An Audit Survival Guide

Albert J. Marcella, Jr., Ph.D., CDP, CFSA, CISA

Carol Stucki, CISA

Copyright 2001, The Institute of Internal Auditors

CONTENTS

About the Authors	ix
Acknowledgments	xi
Dedication	xiii
Introduction	xv

Process Development Life Cycle

Initiation Stage.....	1
Process Definition	15
Process Design.....	45
Process Construction	97
Evaluation and Acceptance	111
Installation and Operation	139
Post-Implementation	163

Audit Programs

PDLC	Overview Considerations	181
	General Introduction.....	183
	General Management Control Considerations	186
	Project Management.....	192
Stages 1 and 2	Initiation and Definition	199
	Project Initiation	205
	Cost/Benefit Analysis.....	206
	User Requirements	207
	Review and Signoff	208
	User Participation	209
	Preliminary Design and Feasibility Analysis	211
Stage 3	Process Design	215
	Conceptual System Design.....	217
	System Specifications.....	223
	Input Controls.....	225
	Processing Controls	227
	Output Controls	227
	Processing and Recovery Controls.....	228
	Security and Integrity	229

Process Development Life Cycle: An Audit Survival Guide

Albert J. Marcella, Jr., Ph.D., CDP, CFSA, CISA

Carol Stucki, CISA

Copyright 2001, The Institute of Internal Auditors

	Security for Systems and Programs	231
	Special Considerations for Online Environments	232
	Systems and Program Documentation	232
	Computer Equipment and Software Planning	234
	Project Evaluation	235
Stages 4 and 5	Process Construction and Evaluation and Acceptance	239
	Detailed System Specifications	242
	Evaluation and Acceptance	246
	Process Construction — Specifications	246
	Process Construction — Input Controls	247
	Process Construction — Processing Controls	250
	Process Construction — Output Controls	253
	Computer Processing Design	256
	Detail System Design	257
	Program Development	258
	System Development	260
	Programming	261
	Integrated System Testing	263
	System Testing	266
	System Validation	267
	Acceptance Testing.....	270
Stage 6	Installation	277
	Installation and Operation	279
	File Conversion	280
	Forms Conversion	281
	Computer Output Reports	282
	Program Conversion.....	283
	Data Dictionary	284
	Effect on Other Systems.....	285
	Parallel Processing	286
	Acceptance by Users of New Applications and Program Modifications	287
	Final Approval of New Applications and Program Modifications by the IT Function	287
	Production Installation	288
	Implementation Procedures	288
	User Procedures and Training	290

Process Development Life Cycle: An Audit Survival Guide

Albert J. Marcella, Jr., Ph.D., CDP, CFSA, CISA

Carol Stucki, CISA

Copyright 2001, The Institute of Internal Auditors

Stage 7	Post-Implementation.....	295
	Post-Implementation Audit.....	297
	Post-Implementation Project Review	299
	System Users	299
	User Comments	300
	System Validation.....	300
	Program Testing	301
	 Program and System Change Control.....	 302
	System Documentation.....	302
	User Approvals.....	303
	Data System Changes.....	304
	Program Maintenance.....	306
	Approval of Modifications to Production Programs	309
	Control of Approved Program Modifications	309
	Testing Program Modifications	309
	Urgent Modifications	310
	 Systems Development and Vendor Package Evaluation	 311
	Audit Procedure	313
	Audit Steps to Assist Purchased Software Evaluation	315
	 Glossary of Terms	 317
	 Works Cited	 335
	 Appendices	
	 Appendix A	
	Project Life Cycle Work Program	343
	 Appendix B	
	Information Questionnaire —	
	Phase I: Problem Identification and Planning	349
	 Appendix C	
	System Development Review	
	Risk Calculation Worksheet	351
	 Appendix D	
	System Development Review	
	Risk Calculation Worksheet – Materiality	357

Process Development Life Cycle: An Audit Survival Guide

Albert J. Marcella, Jr., Ph.D., CDP, CFSA, CISA

Carol Stucki, CISA

Copyright 2001, The Institute of Internal Auditors

Appendix E

System Development Review

Risk Calculation Worksheet – Reporting361

Appendix F

Auditing Purchased Software – Flowchart363

Appendix G

Software Evaluation Questionnaire365

Appendix H

Vendor Reference Worksheet375

Appendix I

Vendor Package Information Questionnaire –

Vendor Package Evaluation377

Appendix J

Audit Inquiry Record –

Vendor Package Controls Evaluation379

Appendix K

Package Control Evaluation – Detail381

Appendix L

Package Control Evaluation – Summary383

Appendix M

Best Practices – Software Acquisition385

Appendix N

Project Management – Audit Review Questions395

Appendix O

Best Practices – Application Testing Checklist403

Appendix P

Best Practices – Application Implementation Techniques419

Appendix Q

Best Practices – Configuration Management439

Process Development Life Cycle: An Audit Survival Guide

Albert J. Marcella, Jr., Ph.D., CDP, CFSA, CISA

Carol Stucki, CISA

Copyright 2001, The Institute of Internal Auditors

Appendix R

Large-Scale, Software-Intensive Programs	
Software Acquisition Questions	463

Appendix S

Project Management Web Sites	489
------------------------------------	-----

Appendix T

Systems Development Process Audit Program	491
---	-----

Appendix U

Process Development – Bad Excuses	
And You Thought You had Heard it All... ..	505

Appendix V

Application Development	
Project Plan.....	523

Appendix W

Data Normalization Example	529
----------------------------------	-----

Appendix X

Project Management Audit Program II.....	533
--	-----