CONTENTS

PREFACE	XV
FOREWORD	xxi

PA	RTI	INTRODI	JCTION
СН	APTER	ONE INTRODUCTION TO DOCUMENT ENGIN	VEERING
1.0	INTRODU	ICTION	4
1.1	A SIMPL	E BUSINESS TRANSACTION?	6
1.2	THE EXT	ENDED OR VIRTUAL ENTERPRISE	8
1.3	IT'S ALL	ABOUT EXCHANGING DOCUMENTS	9
	1.3.1	THE DOCUMENT TYPE SPECTRUM	10
	1.3.2	DOCUMENT EXCHANGE AS A BUILDING BLOCK	
		IN BUSINESS MODEL PATTERNS	11
	1.3.3	DOCUMENT EXCHANGE AS LOOSE COUPLING	13
1.4	UNDERS	TANDING THE MEANING OF DOCUMENTS	14
	1.4.1	INCOMPATIBLE INFORMATION MODELS	16
	1.4.2	STANDARD INFORMATION MODELS	17
1.5	XML AS	AN ENABLING TECHNOLOGY	17
1.6	USING X	ML-ENCODED MODELS TO DESIGN AND DRIVE APPLICATIONS	18
	1.6.1	DOCUMENT MODELS AS INTERFACES	20
	1.6.2	MODELS OF BUSINESS PROCESSES	22
	1.6.3	WEB SERVICES AND SERVICE ORIENTED ARCHITECTURES	23
1.7	DOCUME	INT SPECIFICATIONS	
	AND D	OCUMENT ENGINEERING	26
1.8	DOCUME	NT ENGINEERING—A NEW AND SYNTHETIC DISCIPLINE	27
	1.8.1	BUSINESS PROCESS ANALYSIS	28
	1.8.2	TASK ANALYSIS	29
	1.8.3	DOCUMENT ANALYSIS	29
	1.8.4	DATA ANALYSIS	30
	1.8.5	UNIFICATION IN DOCUMENT ENGINEERING	31
1.9	THE DO	CUMENT ENGINEERING APPROACH	32
1.10	O KEY PO	INTS IN CHAPTER ONE	37

PΑ	RT II	FOUNDATIO	ONS
CH	APTER	TWO XML FOUNDATI	ONS
2.0	INTRODU	JCTION	42
2.1	FROM H	TML TO XML	43
	2.1.1	THE BROWSER WAR	46
	2.1.2	FROM THE WEB FOR EYES TO THE WEB FOR COMPUTERS	47
2.2	XML'S B	IG IDEAS	48
2.3	CREATIO	N OF NEW SETS OF TAGS FOR	
	DOMA	IN-SPECIFIC CONTENT	49
2.4	SEPARA	TION OF CONTENT AND PRESENTATION	51
2.5	DEFINITION	ON OF DOCUMENT TYPES	53
	2.5.1	DOCUMENTS AS IMPLEMENTATION MODELS	54
	2.5.2	XML SCHEMAS	55
	2.5.3.	SCHEMA LANGUAGES	56
	2.5.4	RULES THAT SCHEMA LANGUAGES CAN'T REPRESENT	61
2.6	VALIDAT	ION	62
2.7	CONVER	SION AND TRANSFORMATION	64
		CONVERSION TO XML	64
	2.7.2	TRANSFORMATION FROM XML	67
	2.7.3	WHERE TO TRANSFORM	69
2.8	KEY POI	NTS IN CHAPTER TWO	72
		THREE MODELS, PATTERNS, AND RE	
	INTRODU		74
	MODELS		75
3.2		IG THE CLASSIC MODELING	76
		DACH TO DOCUMENTS	
		EXTERNAL VIEWS: INSTANCES OF DOCUMENT IMPLEMENTATIONS PHYSICAL VIEWS: DOCUMENT IMPLEMENTATION	78
		MODELS (OR SCHEMAS)	79
	3.2.3	CONCEPTUAL VIEWS: DOCUMENT COMPONENT	
		AND ASSEMBLY MODELS	81
3.3	THE MOI	DEL MATRIX	86
	3.3.1	METADATA AND METAMODELS	88

3.3.2 METAMODELS FOR PROCESSES

			CONTENTS
3.4	PATTERN	IS	90
	3.4.1	PATTERNS IN BUSINESS	91
	3.4.2	WHY BUSINESSES FOLLOW PATTERNS	92
	3.4.3	FINDING PATTERNS IN THE MODEL MATRIX	94
	3.4.4	USING THE MODEL MATRIX AS A FRAMEWORK	96
	3.4.5	PROCESS AND DOCUMENTS: YIN AND YANG	97
3.5	KEY POIN	NTS IN CHAPTER THREE	99
CH	APTER	FOUR DESCRIBING WHAT BUSINES	SSES DO
		AND HOW TH	EY DO IT
4.0	INTRODU	ICTION	102
4.1	VIEWS O	F BUSINESS ORGANIZATION	104
	4.1.1	PHYSICAL VIEWS OF BUSINESS ORGANIZATION	104
	4.1.2	CONCEPTUAL VIEWS OF BUSINESS ORGANIZATION	108
	4.1.3	CONCEPTUAL VIEWS OF BUSINESS RELATIONSHIPS	111
4.2	VIEWS O	F BUSINESS PROCESSES	119
	4.2.1	PHYSICAL VIEWS OF BUSINESS PROCESSES	119
	4.2.2	CONCEPTUAL VIEWS OF BUSINESS PROCESSES	120
4.3	VIEWS O	F BUSINESS INFORMATION	128
	4.3.1	PHYSICAL VIEWS OF BUSINESS INFORMATION	128
	4.3.2	CONCEPTUAL VIEWS OF BUSINESS INFORMATION	132
4.4	VIEWS O	F BUSINESS ARCHITECTURE	134
	4.4.1	PHYSICAL VIEWS OF BUSINESS ARCHITECTURE	135
	4.4.2	CONCEPTUAL VIEWS OF BUSINESS ARCHITECTURE	138
4.5	KEY POIN	NTS IN CHAPTER FOUR	145
CH	APTER	FIVE HOW MODELS AND PATTERNS	EVOLVE
5.0	INTRODU	ICTION	150
5.1	THE COE	VOLUTION OF TECHNOLOGY AND BUSINESS MODELS	151
5.2	FROM HI	ERARCHICAL TO NETWORK MODELS	152
5.3	INFORMA	ATION ABOUT GOODS BECOMES A GOOD	156
5.4	NEW BU	SINESS MODELS FOR INFORMATION GOODS	158
5.5	FROM FC	DRECAST OR SCHEDULE-DRIVEN TO DEMAND	159
		NT DDIVEN MODELS	

5.6 FROM TIGHTLY COUPLED TO LOOSELY COUPLED MODELS

33
54
88

CH	APTER	SIX WHEN MODELS DON'T	Г МАТСН:
		THE INTEROPERABILITY CH	ALLENGE
6.0	INTRODU	JCTION	172
6.1	THE INTE	ROPERABILITY CHALLENGE	175
	6.1.1	THE INTEROPERABILITY TARGET	176
	6.1.2	RECOGNIZING EQUIVALENCE	180
6.2	CONTEN	T CONFLICTS	181
6.3	ENCODIN	IG CONFLICTS	184
	6.3.1	LANGUAGE CONFLICTS	184
	6.3.2	GRAMMATICAL CONFLICTS	186
6.4	STRUCT	JRAL CONFLICTS	187
	6.4.1	DOCUMENT ASSEMBLY CONFLICTS	188
	6.4.2	COMPONENT ASSEMBLY CONFLICTS	189
	6.4.3	COMPONENT GRANULARITY CONFLICTS	191
6.5	SEMANT	IC CONFLICTS	193
	6.5.1	FUNCTIONAL DEPENDENCY CONFLICTS	194
	6.5.2	VOCABULARY CONFLICTS	195
	6.5.3	CONTEXTUAL CONFLICTS	198
6.6	MOTIVAT	ING THE DOCUMENT ENGINEERING APPROACH	200
6.7	KEY POIN	NTS IN CHAPTER SIX	203

PART III THE DOCUMENT ENGINEERING APPROACH CHAPTER SEVEN THE DOCUMENT ENGINEERING APPROACH

7.0	INTRODU	JCTION	208
7.1	AN APPE	ROACH, NOT A METHODOLOGY	208
	7.1.1	MODELING METHODOLOGIES	210
7.2	THE DOO	CUMENT ENGINEERING APPROACH	211
	7.2.1	UNIFIED APPROACH TO MODELING	212
	7.2.2	ARTIFACT-FOCUSED VIEW OF MODELING	214
	7.2.3	THE MODELING PHASES, TASKS, AND ARTIFACTS	215
	7.2.4	IMPLEMENTING MODELS IN APPLICATIONS	219

7.3	ANALYZI	NG THE CONTEXT OF USE	221	
	7.3.1	REQUIREMENTS	221	
	7.3.2	PATTERNS OF CONTEXT	223	
	7.3.3	SCOPE OF CONTEXT	224	
7.4	ANALYZI	NG BUSINESS PROCESSES	224	
7.5	DESIGNI	NG BUSINESS PROCESSES	226	
7.6	ANALYZI	NG DOCUMENTS	226	
	7.6.1	CREATE THE DOCUMENT INVENTORY	227	
	7.6.2	SAMPLE THE DOCUMENT INVENTORY	228	
7.7	ANALYZI	NG DOCUMENT COMPONENTS	228	
	7.7.1	HARVEST THE COMPONENTS	229	
	7.7.2	NAME THE CONTENT COMPONENTS	231	
	7.7.3	CONSOLIDATE THE CANDIDATE COMPONENTS	232	
7.8	ASSEMB	LING DOCUMENT COMPONENTS	232	
	7.8.1	FORMALIZE THE COMPONENT MODEL	233	
	7.8.2	ASSOCIATIONS BETWEEN STRUCTURES	234	
	7.8.3	REFINE THE COMPONENT NAMES	234	
7.9	ASSEMB	LING DOCUMENT MODELS	235	
7.10	O IMPLEN	MENTING MODELS	236	
	7.10.1	ENCODING DOCUMENT IMPLEMENTATION MODELS	237	
	7.10.2	ENCODING BUSINESS PROCESS IMPLEMENTATION MODELS	238	
7.1	1 SUMMA	ARY OF MODELING PHASES AND ARTIFACTS	239	
7.12 KEY POINTS IN CHAPTER SEVEN 241				
СН	APTER	EIGHT ANALYZING THE CONTEXT O	OF USE	
8.0	INTRODU	JCTION	244	
8.1	UNDERS	TANDING DOCUMENT AND PROCESS REQUIREMENTS	247	
	8.1.1	STRATEGIC AND TACTICAL REQUIREMENTS	248	
	8.1.2	SOURCES OF REQUIREMENTS	250	
	8.1.3	GENERIC REQUIREMENTS	252	
8.2	CONTEXT	T AND REQUIREMENTS	254	
8.3	EXPRESS	SING REQUIREMENTS AS RULES	259	
	8.3.1	USAGE REQUIREMENTS	261	
	8.3.2	STRUCTURAL REQUIREMENTS	262	
	8.3.3	SEMANTIC REQUIREMENTS	263	

8.3.4

PRESENTATION REQUIREMENTS

	8.3.5	SYNTACTIC REQUIREMENTS	265
	8.3.6	PROCESS REQUIREMENTS	266
	8.3.7	INSTANCE REQUIREMENTS	266
8.4	RULE TY	PES AND CONTEXT DIMENSIONS	268
85	KEY POIN	NTS IN CHAPTER FIGHT	271

CH	APTER	NINE ANALYZING BUSINESS PROG	CESSES
9.0	INTRODU	JCTION	274
9.1	THE LEVI	ELS OF ABSTRACTION CHALLENGE	276
9.2	ANALYZI	ING BUSINESS ORGANIZATION	277
9.3	ANALYZII	NG BUSINESS PROCESSES	280
	9.3.1	BUSINESS PROCESSES, COLLABORATIONS, AND TRANSACTIONS	8 281
	9.3.2	BUSINESS REFERENCE MODELS	284
	9.3.3	BUSINESS PROCESS MODELING ARTIFACTS	286
9.4	ANALYZII	NG BUSINESS TRANSACTIONS	292
	9.4.1	DESCRIBING TRANSACTIONS	293
	9.4.2	DOCUMENTS IN TRANSACTIONS	295
9.5	BUSINES	S SIGNALS: RECEIPTS AND CONFIRMATIONS	298
9.6	TRANSA	CTION PATTERNS	301
	9.6.1	OFFER AND ACCEPTANCE	301
	9.6.2	REQUEST AND RESPONSE	302
	9.6.3	REQUEST AND CONFIRM	303
	9.6.4	QUERY AND RESPONSE	304
	9.6.5	NOTIFICATION	305
	9.6.6	INFORMATION DISTRIBUTION	306
9.7	ANALYZI	ING BUSINESS COLLABORATIONS	307
9.8	COLLABO	DRATION PATTERNS	310
	9.8.1	CONTRACT FORMATION	311
	9.8.2	SOURCING	312
	9.8.3	ESCALATING COMMITMENT	312
	9.8.4	MATERIALS MANAGEMENT IN DISTRIBUTION AND FULFILLMENT	312
	9.8.5	RECONCILIATION	313
	9.8.6	INCREMENTAL INFORMATION TRAIL	313
9.9	KEY POIN	NTS IN CHAPTER NINE	315

CHAPTER	TEN DESIGNING BUSINESS PROCE	SSES
	WITH PATT	ERNS
10.0 INTRO	DUCTION	318
10.1 WHY \	NE USE PATTERNS IN PROCESS MODELS	318
10.2 HOW \	NE USE PATTERNS IN PROCESS MODELS	320
10.3 PATTER	RNS AND THE MODEL MATRIX	321
10.4 IDENTI	FYING CANDIDATE DESIGN PATTERNS	324
10.4.1	GENERALIZING PATTERNS	327
10.4.2	VARYING THE GRANULARITY OF PATTERNS	329
10.4.3	COMBINING PATTERNS	332
10.4.4	USING IMPLEMENTATIONS AS PATTERNS	334
10.5 CH00S	SING APPROPRIATE PATTERNS	337
10.5.1	VALIDATING REQUIREMENTS VS. DISCOVERING THEM	337
10.5.2	REINFORCING CONTEXTS WITH PATTERNS	338
10.5.3	APPLYING PATTERNS TO ACHIEVE INSIGHT	340
10.6 ADAPT	ING PATTERNS	341
10.7 INSTAI	ITIATING PATTERNS TO CREATE NEW MODELS	343
10.7.1	INSTANTIATING ROLES	343
10.7.2	CONFIGURING COLLABORATION AND TRANSACTION PROPERTIES	344
10.8 USING	PATTERNS TO SUGGEST INFORMATION	
COM	PONENTS AND DOCUMENTS	347
10.8.1	KEY INFORMATION COMPONENTS	347
10.8.2	THE DOCUMENT CHECKLIST	349
10.9 KEY PO	DINTS IN CHAPTER TEN	351
CHAPTER	RELEVEN ANALYZING DOCUM	IENTS
11.0 INTRO		354
11.1 WHAT	ARE DOCUMENTS?	355
11.2 CREAT	ING THE INVENTORY	356
11.2.1	DOCUMENT ARCHAEOLOGY AND ANTHROPOLOGY	357
11.2.2	UNDERSTANDING THE ORGANIZATION	359
11.2.3	GENERIC INVENTORY PROCEDURES AND QUESTIONS	360
11.3 SAMPL	LING THE INVENTORY	364
11.3.1	SAMPLING BASED ON DOCUMENT CHARACTERISTICS	364
11.3.2	SAMPLING BASED ON OTHER CONSIDERATIONS	369
11.4 KEY PO	DINTS IN CHAPTER ELEVEN	371

CHAPTER	TWELVE ANALYZING DOCUMENT COMPON	ENTS
12.0 INTRO	DUCTION	374
12.1 HARVE	STING COMPONENTS	374
12.1.1	FINDING COMPONENTS IN TRANSACTIONAL DOCUMENTS	376
12.1.2	FINDING COMPONENTS IN NARRATIVE DOCUMENTS	378
12.1.3	FINDING STRUCTURES FOR COMPONENTS	380
12.1.4	FINDING SEMANTIC CONTENT IN PRESENTATION COMPONENTS	380
12.1.5	FINDING MEANINGFUL CONTENT IN STRUCTURAL COMPONENTS	386
12.1.6	THE TROUBLE WITH TABLES	389
12.1.7	PRESERVING PRESENTATION COMPONENTS	393
12.1.8	ANALYZING SETS OF POSSIBLE VALUES	393
12.1.9	CODE SETS	399
12.1.10	DIDENTIFIERS	402
12.1.1	NAMING COMPONENTS	402
12.2 CONSC	LIDATING COMPONENTS	406
12.2.1	CREATING A CONSOLIDATED TABLE OF CONTENT COMPONENTS	406
12.2.2	ENSURING SEMANTIC UNIQUENESS	412
12.3 KEY PO	DINTS IN CHAPTER TWELVE	416
0114 DTEB		
	THIRTEEN ASSEMBLING DOCUMENT COMPON	
13.0 INTRO		420
	IATIONS BETWEEN COMPONENTS	421
	MENT COMPONENT MODELS	422
	RULES IN NARRATIVE DOCUMENT CONTEXTS	423
	RULES IN TRANSACTIONAL CONTEXTS	426
	DDS FOR AGGREGATING COMPONENTS	427
	THE CLASSICAL DOCUMENT ANALYSIS APPROACH	427
	THE CLASSICAL DATA ANALYSIS APPROACH	429
	NG NORMALIZATION TO DOCUMENT ENGINEERING	429
	FUNCTIONAL DEPENDENCY	430
	ESSENTIALITY	431
	THE NORMAL FORMS	434
	IDENTIFYING PRIMARY KEYS	434
	RECURSIVE ASSOCIATIONS	441
13.4.6	MULTIVALUE DEPENDENCIES	443

13.5 REFINII	NG THE DOCUMENT COMPONENT MODEL	446	
13.5.1	447		
13.5.2	IDENTIFYING COMPONENT PATTERNS	448	
13.5.3	APPLYING COMPONENT PATTERNS	451	
13.5.4	REFINING THE NAMES FOR COMPONENTS	454	
13.6 CHECKING THE QUALITY OF ANALYSIS			
13.7 KEY PO	DINTS IN CHAPTER THIRTEEN	459	
CHAPTER	FOURTEEN ASSEMBLING DOCU	MENT MODELS	
14.0 INTRO	DUCTION	462	
	MENT AND DATABASE MODELS	462	
14.2 DOCUMENT ASSEMBLY MODELS			
	ENCE MODELS FOR DOCUMENT ASSEMBLY	467	
	NING A DOCUMENT ASSEMBLY MODEL	469	
	USING BUSINESS RULES TO GUIDE ASSEMBLY	469	
14.4.2	ASSEMBLING ASSOCIATIONS	471	
14.4.3	CHOOSING THE ENTRY POINT	472	
14.4.4	FOLLOWING THE PATHWAY	474	
14.4.5	DESIGNING FOR IMPLEMENTATION	478	
14.5 DESIGN	NING FOR REUSE	479	
14.5.1	THE CHALLENGE OF CUSTOMIZATION	480	
14.5.2	CORE PLUS CONTEXTUALIZATION	482	
14.6 DOCUM	MENTING THE MODEL	485	
14.7 KEY P0	DINTS IN CHAPTER FOURTEEN	489	
CHAPTER		NTING MODELS	
		APPLICATIONS	
15.0 INTRO		492	
	DING MODELS IN XML	493	
	DOCUMENT MODELS	494	
	PROCESS MODELS	501	
	BASED APPLICATIONS	505	
	HOW MODEL BASED APPLICATIONS WORK	505	
15 2 2	VALHENT ADDITICATIONS ABEN'T BASED ON MODELS	508	

15.2.3 MODEL BASED APPLICATIONS AS A GOAL

INDEX

15.3 MODEL	BASED APPLICATIONS IN DOCUMENT ENGINEERING	510
15.3.1	E-FORM APPLICATIONS	511
15.3.2	E-BOOK APPLICATIONS	521
15.3.3	SINGLE SOURCE PUBLISHING AND PORTAL APPLICATIONS	522
15.3.4	BUSINESS-TO-BUSINESS DOCUMENT EXCHANGES	525
15.3.5	APPLICATIONS WITH INTERMEDIARY PLATFORMS	528
15.3.6	COMPOSITE SERVICES	531
15.3.7	SEMANTIC WEB AND SEMANTIC WEB SERVICE APPLICATIONS	532
15.4 IMPLEMENTING MODELS IN APPLICATIONS: THE FUTURE		535
15.5 KEY POINTS IN CHAPTER FIFTEEN		536

CHAPTER	R SIXTEEN MANAGEMENT	AND STRATEGY
16.0 INTRODUCTION		
16.1 ORGANIZATIONAL MATURITY		542
16.1.1	MOTIVATING CAPABILITY ASSESSMENT	543
16.1.2	THE CAPABILITY MATURITY MODEL	543
16.1.3	THE DOCUMENT ENGINEERING CAPABILITY MATURIT	Y MODEL 545
16.1.4	1.4 CONDUCTING A CAPABILITY ASSESSMENT	
16.2 BUSINESS OBJECTIVES		554
16.2.1	MAKING A BUSINESS CASE	555
16.2.2	A SAMPLE OF PROJECT JUSTIFICATIONS	558
16.2.3	A SAMPLE OF PROJECT RISKS	566
16.3 KEY DOINTS IN CHADTED SIXTEEN 571		

PART IV	THE END OF THE BEGINNING
CHAPTER SEVENTEEN	EPILOGUE
17.0 INTRODUCTION	576
17.1 WHEN DISCIPLINES COLLIDE	576
17.2 THE BUSINESS OF DOCUMENT EN	IGINEERING 577
17.3 THE SUCCESSFUL DOCUMENT EN	IGINEER 578
NOTES	579
GLOSSARY	621

647