

Contents

1	Introduction	15
1.1	Motivation	15
1.2	On the Background of this Work	18
1.3	The Publishing Process of this Dissertation	19
1.4	Overview of Dissertation	20
2	The Publishing Process and Derived Requirements for Workflow Management Systems	23
2.1	The Publishing Process	24
2.1.1	Design and Planning	24
2.1.2	Content Acquisition	27
2.1.3	Value Adding	28
2.1.4	Delivery and Use	28
2.1.5	Document Processing	29
2.2	Basic Requirements	30
2.2.1	Heterogeneous Hardware and Operating Systems	30
2.2.2	User Friendliness	30
2.3	The Underlying Workflow Model	31
2.4	Business Process Re-Engineering (BPR)	31
2.5	Database Functionality	34
2.6	Compound Structured Documents	34
2.7	Communication Facilities	35
2.8	Integration	36
2.9	Development Environment	37

3	Existing Systems	39
3.1	Research Prototypes	42
3.1.1	SCOOP	42
3.1.2	Form Flow	44
3.1.3	ICN - Information Control Net	47
3.1.4	Regatta	49
3.1.5	Others	53
3.1.6	Summary	55
3.2	Commercial Systems	56
3.2.1	Lotus Notes	56
3.2.2	Visual WorkFlo	60
3.2.3	ActionWorkflow	62
3.2.4	Summary	66
4	Enactment: A Process Support System for Electronic Publishing	69
4.1	Workflow Modeling	69
4.2	Architecture	72
4.2.1	Overall Functional Architecture	72
4.2.2	Prototype Architecture	75
4.3	Components	78
4.3.1	SGML Interface	78
4.3.2	Workflow Modeling in HyTime	91
4.3.3	User Interface	120
4.4	A Sample Scenario	123
4.5	Implementation Aspects	126
4.5.1	Visualworks\Smalltalk	126
4.5.2	MarkMinder	127
4.5.3	ArtBASE	129
5	CSCW: Experiences with the Introduction of Workflow Management	133
5.1	Necessary Technological Categorization	134
5.1.1	Information Exchange Systems	134
5.1.2	Information Sharing Systems	135
5.2	Experiences	136
5.3	Lessons Learned	139

- 6 Conclusion, Significance and Future Work** **143**
- 6.1 Conclusion 143
 - 6.1.1 Publishing Process and Requirements 143
 - 6.1.2 Workflow Modeling 144
 - 6.1.3 Prototype Development 144
- 6.2 Significance 144
- 6.3 Future Work 146
 - 6.3.1 Development of a HyTime-Engine 146
 - 6.3.2 Workflow and CORBA 146
 - 6.3.3 Workflow and Object-Oriented Databases 147

- A Definitions and Examples** **149**
- A.1 The Document Type Definition *workflow.dtd* 149
- A.2 The External Entity *actor.ent* 155
- A.3 Example: Production of a CD-ROM Prototype 156

List of Figures

2.1	The Publishing Process	25
2.2	Publishing Activities and their Relationships	26
2.3	Document Flow during the Publishing Process	30
3.1	A Sample Petri-Net	43
3.2	Different Form Types	46
3.3	An Example of ICN Modeling	48
3.4	An Example of Modeling in Regatta	52
3.5	Structure of a FolioPub Publication	54
3.6	Notes Send Model	58
3.7	Notes Common Use Model	58
3.8	The Action Workflow Model	63
4.1	OMT Model of Main Workflow Components	70
4.2	Overall Functional Architecture	73
4.3	The Workflow Reference Architecture	75
4.4	Prototype Architecture	76
4.5	Architecture from a Workflow Point of View	77
4.6	Abstract SGML Interface	79
4.7	Class Hierarchy	83
4.8	Element Tree	84
4.9	The SGMLFileViewer	88
4.10	The Distributed Document Management System	90
4.11	Possible Temporal Relationships	93
4.12	Document Standards and their Applicability	94
4.13	Invoice and its EDIFACT Representation	96
4.14	HyTime's Modules	97

4.15	Different FCS's	105
4.16	Three-Dimensional Space for Workflow Management	106
4.17	Events in a Schedule with Different Data-Objects	107
4.18	Addressing Mechanisms in HyTime	112
4.19	Description of the Example 'CD-ROM Prototype'	116
4.20	The Workflow Server Panel	121
4.21	The Settings Panel	122
4.22	The Workflow Client	123
4.23	A Sample Workflow Editor	124
4.24	A Distributed Scenario	125
5.1	CSCW Technologies	134
6.1	Workflow and CORBA	147

List of Tables

1.1	Support of Information Technology in Production and Office Domain	16
3.1	List of Workflow-Products	40
3.2	Overview of Related Systems	56
3.3	Key Characteristics of Investigated Workflow Tools	67
6.1	Generations of Workflow Systems	145