

TABLE OF CONTENTS

PREFACE	vii
ACKNOWLEDGEMENTS	ix
TABLE OF CONTENTS	xi
1 INTRODUCTION	3
1.1 Software Releasing: A Problematic Area	3
1.2 Increasing Impact of Software	5
1.2.1 Software Size	5
1.2.2 Defect Potentials, Removal Efficiencies and Defect Densities	6
1.3 Improvement Areas	8
1.3.1 Software Productivity	8
1.3.2 Improvement Initiatives	9
1.3.3 Software Crisis?	10
1.4 Available Methodologies, Standards and Models	13
1.4.1 Project Management Methodologies	13
1.4.2 Development Methodologies	15
1.4.3 Maturity Models	15
1.4.4 Standards	17
1.4.5 Testing Standards and Approaches	18
1.4.6 Operational Methodologies	19
1.4.7 Summary	20
1.5 Benefits of a Formal Process	20
1.6 Primary Research Question	21
1.7 Scope of the Study	22
1.8 Conclusion	23
1.9 Thesis Outline	23
2 RESEARCH DESIGN	25
2.1 Introduction	25
2.2 Overall Research Design	25
2.3 Research Philosophy	28
2.4 Research Approach	28
2.5 Research Strategy	29
2.5.1 Exploration Phase	29
2.5.2 Testing Phase	30
2.6 Time Horizon	31
2.7 Data Collection: Reliability and Validity	31
2.8 Role of the Researcher	33
2.9 Summary and Conclusions	34
3 EXISTING THEORY	37
3.1 Introduction	37

3.2	Economic Perspective.....	38
3.2.1	Product Development Strategies	38
3.2.2	Market Entry Strategies	42
3.2.3	Conclusions on Software Release Decisions.....	45
3.3	Software Management Perspective.....	45
3.3.1	Development Cost and Schedule.....	46
3.3.2	Optimal Release Time	51
3.3.3	Operational Cost.....	59
3.3.4	Conclusions on Software Release Decisions.....	61
3.4	Decision-making Perspective.....	61
3.4.1	Collective Decision-making Process.....	62
3.4.2	Decision Types	63
3.4.3	Decision-making Models.....	65
3.4.4	Models of Choice	66
3.4.5	Decision Success	68
3.4.6	Conclusions on Software Release Decisions.....	68
3.5	Summary and Conclusions	68
4	PRACTICAL EXAMPLES.....	71
4.1	Introduction.....	71
4.2	Case Study Approach.....	71
4.3	Case Study Results.....	72
4.3.1	Case Study A	72
4.3.2	Case Study B	74
4.3.3	Case Study C	77
4.3.4	Case Study D	79
4.3.5	Case Study E.....	81
4.3.6	Case Study F.....	83
4.3.7	Case Study G	86
4.4	Answers to the Exploratory Questions	88
4.4.1	Economic Perspective.....	88
4.4.2	Software Management Perspective	91
4.4.3	Decision-making Perspective	95
4.5	Aggregated Results	101
4.6	Adoption Requirements	101
4.7	Summary and Conclusions	103
5	FRAMEWORK OF THE METHODOLOGY.....	107
5.1	Introduction.....	107
5.2	Process Model.....	107
5.3	Release Decision Methodology	109
5.3.1	Design Considerations.....	109
5.3.2	Practices.....	111
5.3.3	Stakeholders	112
5.4	Secondary Research Questions	115
5.5	Summary and Conclusions	116
6	RELEASE DEFINITION.....	117

6.1	Introduction.....	117
6.2	Capital Budgeting Methods	117
6.3	Modelling the Market Entry Trade-off	121
6.3.1	Triangular Time-to-Market Model	121
6.3.2	Triangular Time-to-Market Model with Saturation.....	123
6.3.3	Extended Model with Cost Functions	124
6.4	Applicability to Strategic Software Release Decisions.....	127
6.5	Practices Identified	133
6.6	Summary and Conclusions	135
7	RELEASE INFORMATION	137
7.1	Introduction.....	137
7.2	Economics of Information	137
7.3	Applicability to Strategic Software Release Decisions.....	143
7.3.1	Refined Model.....	144
7.3.2	Optimal Information Level.....	146
7.4	Practices Identified	148
7.5	Summary and Conclusions	150
8	RELEASE DECISION	151
8.1	Introduction.....	151
8.2	Intra-individual and Group Conflicts.....	151
8.2.1	Intra-individual Conflicts	151
8.2.2	Group Conflicts	155
8.3	Collective Decision-making.....	157
8.3.1	Sociological Aspects.....	157
8.3.2	Political Aspects	160
8.4	Applicability to Strategic Software Release Decisions.....	161
8.4.1	Sociological Aspects.....	162
8.4.2	Political Aspects	163
8.4.3	Quality of Decision Outcome	164
8.5	Practices Identified	165
8.6	Summary and Conclusions	167
9	RELEASE IMPLEMENTATION	169
9.1	Introduction.....	169
9.2	Decision Implementation.....	169
9.2.1	Implementation Success	169
9.2.2	Organizational Learning.....	170
9.3	Applicability to Strategic Software Release Decisions.....	173
9.3.1	Implementation Success	173
9.3.2	Organizational Learning.....	174
9.4	Practices Identified	175
9.5	Summary and Conclusions	177
10	REVIEW AND PROPERTIES OF THE METHODOLOGY	179

10.1	Introduction	179
10.2	Review of the Methodology	179
10.2.1	Maximizing, Optimizing or Satisficing?	179
10.2.2	Compliance with the Process Model	180
10.2.3	Compliance with Additional Requirements.....	182
10.3	Properties of the Methodology	184
10.4	Summary and Conclusions	186
11	VALIDATION OF THE METHODOLOGY.....	189
11.1	Introduction	189
11.2	Case Study Approach	189
11.3	Results ~ Case Study H	191
11.3.1	Case Description.....	191
11.3.2	Analysis	193
11.4	Results ~ Case Study I.....	195
11.4.1	Case Description.....	195
11.4.2	Analysis	198
11.5	Results ~ Case Study J.....	199
11.5.1	Case Description.....	199
11.5.2	Analysis	201
11.6	Review of Results	204
11.6.1	Overall Conclusions	204
11.6.2	External Validity.....	205
11.7	Summary and Conclusions	206
12	CONCLUSIONS AND RECOMMENDATIONS	209
12.1	Introduction	209
12.2	Review of Research Questions and Results.....	210
12.2.1	1 st Secondary Research Question.....	210
12.2.2	2 nd Secondary Research Question.....	210
12.2.3	3 rd Secondary Research Question	211
12.2.4	4 th Secondary Research Question	212
12.2.5	Primary Research Question	212
12.3	External Validity of the Methodology	213
12.4	Research Philosophy, Approach and Strategy.....	214
12.5	Directions for Further Research.....	215
12.6	Closing Remark: Do the Numbers Really Matter?.....	217
	EPILOGUE.....	219
	APPENDIX A: CASE STUDY PROTOCOL	222
	APPENDIX B: QUESTIONNAIRE 1	224
	APPENDIX C: CROSS-REFERENCE - QUESTIONNAIRE 1.....	228
	APPENDIX D: QUESTIONNAIRE 2	229
	APPENDIX E: CROSS-REFERENCE - QUESTIONNAIRE 2.....	236
	APPENDIX F: OVERVIEW OF PROCESS AREAS.....	237

GLOSSARY	241
REFERENCES	247
SAMENVATTING (SUMMARY IN DUTCH)	265
ABOUT THE AUTHOR.....	275
INDEX	277

INTRODUCTION AND RESEARCH DESIGN

