

---

**THE DSSSL BOOK**  
*An XML/SGML Programming Language*

## *Related Recent Titles*

### **Understanding SGML and XML Tools: Practical Programs for Handling Structured Text**

Peter Flynn

ISBN 0-7923-8169-6, 1998

<http://www.wkap.nl/prod/b/0-7923-8169-6>

### **The SGML FAQ Book: Understanding the Foundation of HTML and XML**

Steven J. DeRose

ISBN 0-7923-9943-9, 1997

<http://www.wkap.nl/prod/b/0-7923-9943-9>

### **Practical SGML, Second Edition**

Eric van Herwijnen

ISBN 0-7923-9434-8, 1994

<http://www.wkap.nl/prod/b/0-7923-9434-8>

### **Making Hypermedia Work: A User's Guide to HyTime**

Steven J. DeRose and David G. Durand

ISBN 0-7923-9432-1, 1994

<http://www.wkap.nl/prod/b/0-7923-9432-1>

---

# **THE DSSSL BOOK**

*An XML/SGML Programming Language*

*by*

**Javier Farreres**

*Universitat Politècnica de Catalunya (UPC)*

**Technical translation and technical revision**

*James Bostock*

**Technical revision and author of style language code example  
(section 7.5)**

*Jany Quintard*



**SPRINGER SCIENCE+BUSINESS MEDIA, LLC**

---

**Library of Congress Cataloging-in-Publication Data**

The DSSL Book: *A XML/SGML Programming Language*

Javier Farreres

ISBN 978-1-4613-5116-0 ISBN 978-1-4615-0517-4 (eBook)

DOI 10.1007/978-1-4615-0517-4

---

"This book was written on a Debian Linux laptop using emacs with SGML support. The document was written in SGML using DocBook v4.2 DTD. The book was formatted using a customization of the DocBook DSSSL stylesheets with the OpenJade tool. Some final editions were made on the PDF file by means of Acrobat <sup>TM</sup>."

**Copyright** © 2004 by Springer Science+Business Media New York

Originally published by Kluwer Academic Publishers in 2004

Softcover reprint of the hardcover 1st edition 2004

All rights reserved. No part of this work may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, microfilming, recording, or otherwise, without prior written permission from the Publisher, with the exception of any material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work.

Permission for books published in Europe: [permissions@wkap.nl](mailto:permissions@wkap.nl)

Permissions for books published in the United States of America: [permissions@wkap.com](mailto:permissions@wkap.com)

*Printed on acid-free paper.*

# Table of Contents

<b>1. Introduction</b> .....	<b>1</b>
<b>2. The DSSSL Specification</b> .....	<b>5</b>
2.1. Architectural Forms.....	5
2.2. The DSSSL Architectural Form.....	5
2.3. Features .....	7
2.3.1. Transformation Specification Features .....	7
2.3.2. Style Specification Features.....	8
2.4. Character Repertoires.....	9
2.5. SGML Grove Plan.....	11
2.6. External Specification .....	12
2.7. Stylesheet Partitioning.....	12
<b>3. The Programming Language</b> .....	<b>13</b>
3.1. Introduction .....	13
3.2. Expressions.....	13
3.2.1. Literals .....	14
3.2.2. Lambda Expressions .....	14
3.2.3. Procedure Application .....	15
3.2.4. Some More Complex Procedures .....	16
3.2.5. Variables .....	17
3.2.6. DSSSL Style Guide .....	17
3.2.7. Quotation of Expressions.....	18
3.2.8. Conditional .....	19
3.2.9. Scopes .....	20
3.2.10. And, Or .....	21
3.2.11. Quasiquote .....	22
3.3. Data Types.....	22
3.3.1. Booleans .....	22
3.3.2. Pairs and Lists .....	23
3.3.2.1. Lists and Quote .....	23
3.3.3. Symbols .....	25
3.3.4. Keywords .....	25
3.3.5. Quantities .....	25
3.3.6. Characters .....	25
3.3.7. Strings.....	26
3.3.8. Procedures.....	26
3.4. Repetitive Processing .....	26
3.4.1. Lists.....	26
3.4.2. Recursion .....	26
3.4.3. Tail Recursion.....	27
3.4.4. Named Let .....	29
3.4.5. Map and Reduce .....	29
3.5. Standard Procedures.....	31
3.5.1. Booleans .....	31
3.5.2. Equivalence.....	31
3.5.3. Pairs and Lists.....	31
3.5.4. Symbols .....	35

3.5.5. Keywords .....	35
3.5.6. Quantities and Numbers .....	36
3.5.6.1. Exactness in Quantities .....	43
3.5.7. Characters .....	44
3.5.7.1. Character Properties .....	45
3.5.7.2. Language-Dependent Operations .....	47
3.5.8. Strings .....	49
3.5.9. Procedures .....	51
3.5.10. Date and Time .....	52
3.5.11. Error Signaling .....	52
3.6. Core Expression Language .....	52
<b>4. The Process of Grove Construction .....</b>	<b>55</b>
4.1. Introduction .....	55
4.2. Property Sets .....	56
4.3. Intrinsic Data Types .....	57
4.4. Intrinsic Properties .....	57
4.5. Grove Plans .....	58
4.6. The SGML Property Set .....	59
4.7. The Grove .....	62
4.8. Classes of the SGML Propset .....	62
4.8.1. Class SGML-DOCUMENT .....	63
4.8.2. Class SGML-CONSTANTS .....	64
4.8.3. Class ATTRIBUTE-ASSIGNMENT .....	64
4.8.4. Class ATTRIBUTE-VALUE-TOKEN .....	65
4.8.5. Class DATA-CHAR .....	66
4.8.6. Class SDATA .....	66
4.8.7. Class PI .....	67
4.8.8. Class DOCUMENT-TYPE .....	68
4.8.9. Class ENTITY .....	69
4.8.10. Class NOTATION .....	69
4.8.11. Class EXTERNAL-ID .....	70
4.8.12. Class ELEMENT .....	70
4.8.13. Class EXTERNAL-DATA .....	72
4.8.14. Class S-SEP .....	72
4.8.15. Class COMMENT .....	73
4.8.16. Class COMMENT-DECL .....	73
4.8.17. Class IGNORED-MARKUP .....	73
4.8.18. Class ENTITY-START .....	74
4.8.19. Class ENTITY-END .....	74
4.8.20. Class MARKED-SECTION-IGNORED-CHAR .....	74
4.8.21. Class INTERP-IGNORED-CHAR .....	74
4.8.22. Class GENERAL-DELIM .....	75
4.8.23. Class NAME .....	75
4.8.24. Class RESERVED-NAME .....	75
4.8.25. Class LITERAL .....	75
4.8.26. Class NUMBER .....	76
4.8.27. Class CHAR-REF-CHAR-NUMBER .....	76
4.8.28. Class REF-END-RE .....	76

4.8.29. Class ATTRIBUTE-VALUE .....	76
4.8.30. Class NAME-TOKEN .....	77
4.8.31. Class MARKED-SECTION-START .....	77
4.8.32. Class MARKED-SECTION-END .....	77
4.8.33. Class CHAR-SET .....	78
4.8.34. Class CHAR-DESC .....	78
4.8.35. Class SYNTAX .....	78
4.8.36. Class ADDED-FUNCTION-CHAR .....	79
4.8.37. Class DELIM-ROLE-ASSOC .....	80
4.8.38. Class SYNTACTIC-LITERAL-ASSOC .....	80
4.8.39. Class CAPACITY-SET .....	80
4.8.40. Class FEATURES .....	81
4.8.41. Class SGML-DECL .....	81
4.8.42. Class ELEMENT-TYPE .....	81
4.8.43. Class MODEL-GROUP .....	83
4.8.44. Class PCDATA-TOKEN .....	83
4.8.45. Class ELEMENT-TOKEN .....	83
4.8.46. Class ATTRIBUTE-DEF .....	83
4.8.47. Class DEFAULT-ENTITY .....	85
4.8.48. Class DOCTPDCL .....	85
4.8.49. Class ATTRIBUTE-DEF-LIST-DECL .....	86
4.8.50. Class ELEMENT-TYPE-DECL .....	86
4.8.51. Class ENTITY-DECL .....	86
4.8.52. Class NOTATION-DECL .....	87
4.8.53. Class IGNORED-RS .....	87
4.8.54. Class IGNORED-RE .....	87
4.8.55. Class RE-POSITION .....	88
4.8.56. Class RANK-STEM .....	88
4.8.57. Class SHORT-REF-MAP .....	88
4.8.58. Class SHORT-REF-ASSOC .....	88
4.8.59. Class SHORT-REF-USE-DECL .....	89
4.8.60. Class SHORT-REF .....	89
4.8.61. Class SHORT-REF-MAP-DECL .....	89
4.8.62. Class SIMPLE-LINK-INFO .....	90
4.8.63. Class LINK-TYPE .....	90
4.8.64. Class LINK-SET .....	90
4.8.65. Class LINK-RULE .....	91
4.8.66. Class LINK-TYPE-DECL .....	92
4.8.67. Class LINK-SET-DECL .....	92
4.8.68. Class ID-LINK-SET-DECL .....	92
4.8.69. Class LINK-SET-USE-DECL .....	93
4.8.70. Class SUBDOCUMENT .....	93
4.8.71. Class FORMAL-PUBLIC-ID .....	94
4.8.72. Graphical Examples .....	94

<b>5. The Standard Document Query Language (SDQL)</b> .....	<b>99</b>
5.1. Introduction .....	99
5.2. Query Language Datatypes .....	99
5.2.1. Node Lists.....	100
5.2.1.1. Node Lists Primitive Procedures.....	100
5.2.1.2. Derived Procedures .....	101
5.2.2. Named Node Lists .....	105
5.3. Node Procedures .....	105
5.4. Property Procedures .....	106
5.4.1. Primitive Procedures.....	106
5.4.2. Derived Procedures.....	106
5.4.3. Base Grove for the Examples .....	106
5.4.4. Procedures on Generic Properties.....	109
5.4.5. Composition.....	118
5.4.6. The Core Query Language.....	120
5.4.6.1. Core Query Language Node Lists.....	120
5.4.6.2. Allowed Procedures .....	120
5.4.6.3. Navigation .....	121
5.4.6.4. Counting.....	122
5.4.6.5. Accessing Attribute Values .....	123
5.4.6.6. Testing Current Location.....	124
5.4.6.7. Entities .....	125
5.4.6.8. Notations .....	126
5.4.6.9. Name Normalization .....	127
5.4.7. SGML Property Procedures.....	127
5.4.8. Auxiliary Parsing .....	130
5.4.8.1. Word Searching .....	130
5.4.8.2. Node Regular Expressions .....	131
5.5. Exercises.....	137
<b>6. The Transformation Process</b> .....	<b>141</b>
6.1. Introduction .....	141
6.2. Processing Model Overview.....	142
6.3. The Transformer.....	143
6.4. The Transformation Language .....	143
6.5. Transformation Expressions.....	144
6.5.1. Create-spec .....	144
6.5.1.1. Subgrove-spec .....	144
6.5.1.2. Create-spec Procedures .....	147
6.5.1.3. Result-node-list Query Language Procedures.....	149
6.5.2. Transform-grove-spec .....	151
6.5.3. Transformation Patterns.....	151
6.5.3.1. Neutral Transformation .....	152
6.5.3.2. To Insert an Empty Element into an Empty Element.....	153
6.5.3.3. To Insert an Empty Element into a non Empty Element..	154
6.5.3.4. To Insert an Intermediate Element .....	156
6.5.3.5. To Delete an Empty Element .....	157
6.5.3.6. To Add an Attribute.....	157
6.5.3.7. To Modify the Value of an Attribute .....	159



6.5.3.8. To Delete an Attribute from an Element .....	160
6.5.3.9. To Delete a non Empty Element .....	161
6.5.3.10. To Specify of a String .....	162
6.5.4. Explaining Exercises .....	163
6.5.5. Transliteration .....	170
6.5.6. SGML Document Generator.....	170
<b>7. The Style Process.....</b>	<b>173</b>
7.1. Introduction .....	173
7.2. Tutorial of the Style Language .....	174
7.2.1. Construction rules.....	174
7.2.2. Construct Expressions .....	176
7.2.3. Contextualization of Elements.....	176
7.2.4. Precedence between Multiple Construction Rules .....	177
7.2.5. Atomic and Non-atomic Flow Objects .....	178
7.2.6. Ports .....	179
7.2.7. Area Types .....	180
7.2.8. Sosofos.....	183
7.2.9. Processing of Children.....	184
7.2.10. Multiple Processing of Children.....	186
7.2.11. Styles.....	187
7.2.12. Inheritance of Characteristics .....	188
7.2.13. Accessing Characteristic Values .....	190
7.2.14. Order of Priority in the Definition of Characteristics .....	190
7.2.15. Processing Modes .....	191
7.2.16. Processing Node Lists.....	192
7.2.17. Spaces .....	193
7.2.18. Font Information .....	193
7.2.19. Colors.....	193
7.3. Detailed Explanation of the Flow Object Classes .....	195
7.3.1. Common Characteristics.....	195
7.3.1.1. Display Spaces .....	199
7.3.1.2. Length Specification .....	200
7.3.2. The Simple-page-sequence Flow Object .....	201
7.3.3. The Page-sequence and Column-set-sequence Flow Objects.....	204
7.3.3.1. The Page-sequence Flow Object .....	204
7.3.3.2. The Column-set-sequence Flow Object.....	209
7.3.3.3. Synchronization of Flow Objects.....	214
7.3.3.4. Generation of Text Dependent on the Layout .....	215
7.3.3.4.1. General Indirect Sosofos .....	216
7.3.3.4.2. Asis indirect sosofos.....	217
7.3.3.4.3. Number indirect sosofos.....	219
7.3.3.5. Decoration Areas.....	222
7.3.4. Paragraph, Paragraph-break and Alignment-point .....	223
7.3.4.1. The Paragraph Flow Object.....	223
7.3.4.2. The Paragraph-break Flow Object .....	230
7.3.4.3. The Alignment-point Flow Object .....	233
7.3.5. The Line-field Flow Object.....	233
7.3.6. The Side-by-side and Side-by-side-item Flow Objects .....	234

7.3.6.1. The Side-by-side Flow Object .....	234
7.3.6.2. The Side-by-side-item Flow Object .....	235
7.3.7. Classes for Formatting Tables.....	236
7.3.7.1. The Table Flow Object.....	236
7.3.7.2. The Table-part Flow Object .....	237
7.3.7.3. The Table-column Flow Object.....	238
7.3.7.4. The Table-row Flow Object .....	240
7.3.7.5. The Table-cell Flow Object.....	240
7.3.7.6. The Table-border Flow Object .....	244
7.3.7.7. Table Configurations .....	245
7.3.7.8. Inheritance of Characteristics in Tables .....	246
7.3.8. The Sideline Flow Object .....	246
7.3.9. The Display-group Flow Object .....	247
7.3.10. The Character Flow Object.....	248
7.3.10.1. Inline Spaces .....	253
7.3.10.2. Glyph Id .....	253
7.3.10.3. Glyph Subst Table .....	254
7.3.11. The Glyph-annotation Flow Object .....	255
7.3.12. The Leader Flow Object .....	255
7.3.13. The Box Flow Object.....	257
7.3.14. The Score Flow Object .....	259
7.3.15. The Included-container-area Flow Object .....	260
7.3.16. The External-graphic Flow Object .....	262
7.3.17. The Rule Flow Object.....	264
7.3.18. The Embedded-text Flow Object.....	265
7.3.19. The Anchor Flow Object .....	266
7.3.20. The Sequence Flow Object.....	267
7.3.21. The Aligned-column Flow Object .....	267
7.3.22. The Multi-line-inline-note Flow Object .....	269
7.3.23. The Emphasizing-mark Flow Object.....	270
7.3.24. Classes for Mathematical Formulae .....	271
7.3.24.1. The Math-sequence Flow Object .....	271
7.3.24.2. The Unmath Flow Object.....	271
7.3.24.3. The Script Flow Object.....	272
7.3.24.4. The Mark Flow Object .....	274
7.3.24.5. The Fence Flow Object .....	275
7.3.24.6. The Fraction Flow Object .....	275
7.3.24.7. The Radical Flow Object .....	276
7.3.24.8. The Math-operator Flow Object.....	277
7.3.24.9. The Grid Flow Object .....	278
7.3.24.10. The Grid-cell Flow Object .....	279
7.3.25. Online flow objects .....	280
7.3.25.1. The Scroll Flow Object .....	280
7.3.25.2. The Multi-mode Flow Object.....	281
7.3.25.3. The Link Flow Object .....	281
7.3.25.3.1. Addresses.....	282
7.3.25.4. The Marginalia Flow Object .....	283
7.4. Additional Classes.....	283

7.5. Basic example.....	284
7.6. Catalog of Flow Object Classes .....	301
<b>A. Tools Supporting DSSSL .....</b>	<b>305</b>
A.1. DSSSLprint .....	305
A.1.1. Description.....	305
A.1.2. Automatization and Process Flow .....	307
A.1.3. Level of Coverage of DSSSL.....	310
A.1.4. Extensions over the Standard.....	310
A.1.4.1. Line-field.....	310
A.1.4.2. Link .....	310
A.1.4.3. Display-group.....	311
A.1.4.4. External-graphic.....	312
A.1.4.5. Sideline.....	312
A.1.4.6. Superscript.....	313
A.1.4.7. Subscript.....	313
A.1.4.8. Common Characteristics of Displayed Objects .....	313
A.1.4.9. Table-cell.....	314
A.1.4.10. Table-row.....	314
A.1.4.11. Common Flow Object Characteristics .....	314
A.1.4.12. Column-set-sequence .....	315
A.2. OpenJade .....	315
<b>Bibliography .....</b>	<b>317</b>
<b>Index.....</b>	<b>319</b>

# List of Tables

3-1. Pre-defined character properties .....	45
3-2. Character properties pre-defined by style language .....	45
4-1. Properties of SGML-DOCUMENT in baseabs .....	63
4-2. Properties of SGML-DOCUMENT in prlgabs0.....	63
4-3. Properties of SGML-DOCUMENT in instabs .....	63
4-4. Properties of SGML-DOCUMENT in sdclabs.....	63
4-5. Properties of SGML-DOCUMENT in sdclsds.....	64
4-6. Properties of SGML-CONSTANTS .....	64
4-7. Properties of ATTRIBUTE-ASSIGNMENT in baseabs .....	64
4-8. Properties of ATTRIBUTE-ASSIGNMENT in basesds1 .....	65
4-9. Properties of ATTRIBUTE-ASSIGNMENT in prlgabs1 .....	65
4-10. Properties of ATTRIBUTE-VALUE-TOKEN in baseabs .....	65
4-11. Properties of ATTRIBUTE-VALUE-TOKEN in instabs.....	65
4-12. Properties of DATA-CHAR in baseabs .....	66
4-13. Properties of DATA-CHAR in basesds1.....	66
4-14. Properties of DATA-CHAR in instsds1 .....	66
4-15. Properties of DATA-CHAR in linkabs .....	66
4-16. Properties of SDATA in baseabs.....	67
4-17. Properties of SDATA in basesds0 .....	67
4-18. Properties of SDATA in basesds1 .....	67
4-19. Properties of PI in baseabs.....	67
4-20. Properties of PI in basesds0.....	67
4-21. Properties of PI in basesds1.....	67
4-22. Properties of DOCUMENT-TYPE in prlgabs0 .....	68
4-23. Properties of DOCUMENT-TYPE in prlgabs1 .....	68
4-24. Properties of DOCUMENT-TYPE in prlgsds .....	68
4-25. Properties of DOCUMENT-TYPE in srabs.....	68
4-26. Properties of ENTITY in prlgabs0 .....	69
4-27. Properties of ENTITY in basesds0.....	69
4-28. Properties of ENTITY in prlgsds.....	69
4-29. Properties of NOTATION in prlgabs0.....	69
4-30. Properties of NOTATION in prlgabs1 .....	70
4-31. Properties of NOTATION in prlgsds .....	70
4-32. Properties of EXTERNAL-ID in prlgabs0 .....	70
4-33. Properties of EXTERNAL-ID in fpiabs .....	70
4-34. Properties of ELEMENT in instabs.....	70
4-35. Properties of ELEMENT in prlgabs1 .....	71
4-36. Properties of ELEMENT in instsds0 .....	71
4-37. Properties of ELEMENT in instsds1 .....	71
4-38. Properties of ELEMENT in dtgabs .....	71
4-39. Properties of ELEMENT in linkabs .....	71
4-40. Properties of EXTERNAL-DATA in instabs .....	72
4-41. Properties of EXTERNAL-DATA in instsds1 .....	72
4-42. Properties of S-SEP in basesds1 .....	73
4-43. Properties of COMMENT in basesds1 .....	73
4-44. Properties of COMMENT-DECL in basesds1 .....	73

4-45. Properties of IGNORED-MARKUP in basesds1 .....	73
4-46. Properties of ENTITY-START in basesds1 .....	74
4-47. Properties of MARKED-SECTION-IGNORED-CHAR in basesds1 .....	74
4-48. Properties of INTERP-IGNORED-CHAR in basesds1 .....	74
4-49. Properties of GENERAL-DELIM in basesds1 .....	75
4-50. Properties of NAME in basesds1 .....	75
4-51. Properties of RESERVED-NAME in basesds1 .....	75
4-52. Properties of LITERAL in basesds1 .....	76
4-53. Properties of NUMBER in basesds1 .....	76
4-54. Properties of CHAR-REF-CHAR-NUMBER in basesds1 .....	76
4-55. Properties of ATTRIBUTE-VALUE in basesds1 .....	77
4-56. Properties of NAME-TOKEN in basesds1 .....	77
4-57. Properties of MARKED-SECTION-START in basesds1 .....	77
4-58. Properties of MARKED-SECTION-END in basesds1 .....	77
4-59. Properties of CHAR-SET in sdclabs .....	78
4-60. Properties of CHAR-DESC in sdclabs .....	78
4-61. Properties of SYNTAX in sdclabs .....	78
4-62. Properties of ADDED-FUNCTION-CHAR in sdclabs .....	79
4-63. Properties of ADDED-FUNCTION-CHAR in sdclabs .....	80
4-64. Properties of SYNTACTIC-LITERAL-ASSOC in sdclabs .....	80
4-65. Properties of CAPACITY-SET in sdclabs .....	80
4-66. Properties of FEATURES in sdclabs .....	81
4-67. Properties of SGML-DECL in sdclsds .....	81
4-68. Properties of ELEMENT-TYPE in prlgabs1 .....	82
4-69. Properties of ELEMENT-TYPE in prlgabs .....	82
4-70. Properties of ELEMENT-TYPE in dtgabs .....	82
4-71. Properties of ELEMENT-TYPE in rankabs .....	82
4-72. Properties of ELEMENT-TYPE in srabs .....	83
4-73. Properties of MODEL-GROUP in prlgabs1 .....	83
4-74. Properties of ELEMENT-TOKEN in prlgabs1 .....	83
4-75. Properties of ATTRIBUTE-DEF in prlgabs1 .....	84
4-76. Properties of ATTRIBUTE-DEF in prlgabs .....	84
4-77. Properties of DEFAULT-ENTITY in prlgabs1 .....	85
4-78. Properties of DEFAULT-ENTITY in prlgabs .....	85
4-79. Properties of DOCTPDCL in prlgabs .....	85
4-80. Properties of ATTRIBUTE-DEF-LIST-DECL in prlgabs .....	86
4-81. Properties of ELEMENT-TYPE-DECL in prlgabs .....	86
4-82. Properties of ENTITY-DECL in prlgabs .....	87
4-83. Properties of NOTATION-DECL in prlgabs .....	87
4-84. Properties of IGNORED-RS in instsds1 .....	87
4-85. Properties of IGNORED-RE in instsds1 .....	87
4-86. Properties of RE-POSITION in instsds1 .....	88
4-87. Properties of RANK-STEM in rankabs .....	88
4-88. Properties of SHORT-REF-MAP in srabs .....	88
4-89. Properties of SHORT-REF-ASSOC in srabs .....	88
4-90. Properties of SHORT-REF-USE-DECL in srabs .....	89
4-91. Properties of SHORT-REF in srabs .....	89
4-92. Properties of SHORT-REF-MAP-DECL in srabs .....	89

4-93. Properties of SIMPLE-LINK-INFO in linkabs .....	90
4-94. Properties of LINK-TYPE in linkabs .....	90
4-95. Properties of LINK-TYPE in linksds .....	90
4-96. Properties of LINK-SET in linkabs .....	91
4-97. Properties of LINK-SET in linksds .....	91
4-98. Properties of LINK-RULE in linkabs.....	91
4-99. Properties of LINK-TYPE-DECL in linksds.....	92
4-100. Properties of LINK-SET-DECL in linksds.....	92
4-101. Properties of ID-LINK-SET-DECL in linksds .....	93
4-102. Properties of LINK-SET-USE-DECL in linksds.....	93
4-103. Properties of SUBDOCUMENT in subdcabs .....	93
4-104. Properties of SUBDOCUMENT in subdcds.....	93
4-105. Properties of FORMAL-PUBLIC-ID in fpiabs.....	94
5-3. Class root in regexp propset .....	136
5-4. Class group in regexp propset.....	136
7-1. Common Characteristics.....	195
7-2. Ports of the Simple-page-sequence Flow Object.....	201
7-3. Uncommon Characteristics of the Simple-page-sequence Flow Object .....	201
7-4. Common Characteristics of the Simple-page-sequence Flow Object .....	202
7-5. Ports of the Page-sequence Flow Object .....	204
7-6. Uncommon Characteristics of the Page-sequence Flow Object.....	205
7-7. Ports of the Column-set-sequence Flow Object .....	209
7-8. Uncommon Characteristics of the Column-set-sequence Flow Object .....	209
7-9. Common Characteristics of the Column-set-sequence Flow Object.....	210
7-10. Ports of the Paragraph Flow Object.....	223
7-11. Uncommon Characteristics of the Paragraph Flow Object .....	223
7-12. Common Characteristics of the Paragraph Flow Object .....	227
7-13. Uncommon Characteristics of the Paragraph-break Flow Object .....	231
7-14. Common Characteristics of paragraph-break.....	232
7-15. Ports of the Line-field Flow Object .....	233
7-16. Uncommon Characteristics of the Line-field Flow Object.....	233
7-17. Common Characteristics of the Line-field Flow Object.....	233
7-18. Ports of the Side-by-side Flow Object.....	234
7-19. Uncommon Characteristics of the Side-by-side Flow Object .....	234
7-20. Common Characteristics of the Side-by-side Flow Object .....	234
7-21. Ports of the Side-by-side-item Flow Object .....	235
7-22. Uncommon Characteristics of the Side-by-side-item Flow Object.....	235
7-23. Common Characteristics of side-by-side-item .....	235
7-24. Ports of the Table Flow Object .....	236
7-25. Uncommon Characteristics of the Table Flow Object.....	236
7-26. Common Characteristics of the Table Flow Object.....	237
7-27. Ports of the Table-part Flow Object.....	238
7-28. Uncommon Characteristics of the Table-part Flow Object .....	238
7-29. Common Characteristics of table-part.....	238
7-30. Uncommon Characteristics of the Table-column Flow Object .....	239
7-31. Common Characteristics of the Table-column Flow Object .....	239
7-32. Ports of the Table-row Flow Object.....	240
7-33. Ports of the Table-cell Flow Object.....	241

7-34. Uncommon Characteristics of the Table-cell Flow Object.....	241
7-35. Common Characteristics of table-cell .....	242
7-36. Uncommon Characteristics of the Table-border Flow Object.....	244
7-37. Common Characteristics of the Table-border Flow Object.....	245
7-38. Ports of the Sideline Flow Object.....	247
7-39. Uncommon Characteristics of the Sideline Flow Object .....	247
7-40. Common Characteristics of the Sideline Flow Object .....	247
7-41. Ports of the Display-group Flow Object.....	248
7-42. Uncommon Characteristics of the Display-group Flow Object .....	248
7-43. Common Characteristics of the Display-group Flow Object .....	248
7-44. Uncommon Characteristics of the Character Flow Object.....	248
7-45. Common Characteristics of the Character Flow Object.....	252
7-46. Ports of the Glyph-annotation Flow Object.....	255
7-47. Uncommon Characteristics of the Glyph-annotation Flow Object .....	255
7-48. Common Characteristics of the Glyph-annotation Flow Object .....	255
7-49. Ports of the Leader Flow Object.....	255
7-50. Uncommon Characteristics of the Leader Flow Object .....	256
7-51. Common Characteristics of the Leader Flow Object .....	256
7-52. Ports of the Box Flow Object .....	257
7-53. Uncommon Characteristics of the Box Flow Object.....	257
7-54. Common Characteristics of the Box Flow Object.....	258
7-55. Uncommon Characteristics of the Score Flow Object .....	259
7-56. Common Characteristics of the Score Flow Object .....	259
7-57. Ports of the Included-container-area Flow Object.....	260
7-58. Uncommon Characteristics of the Included-container-area Flow Object .....	261
7-59. Common Characteristics of the Included-container-area Flow Object .....	261
7-60. Uncommon Characteristics of the External-graphic Flow Object.....	262
7-61. Common Characteristics of the External-graphic Flow Object.....	262
7-62. Uncommon Characteristics of the Rule Flow Object.....	264
7-63. Common Characteristics of the Rule Flow Object.....	265
7-64. Ports of the Embedded-text Flow Object.....	266
7-65. Uncommon Characteristics of the Embedded-text Flow Object .....	266
7-66. Common Characteristics of the Embedded-text Flow Object .....	266
7-67. Uncommon Characteristics of the Anchor Flow Object.....	266
7-68. Common Characteristics of the Anchor Flow Object.....	267
7-69. Ports of the Sequence Flow Object.....	267
7-70. Ports of the Aligned-column Flow Object.....	267
7-71. Common Characteristics of the Aligned-column Flow Object .....	268
7-72. Ports of the Multi-line-inline-note Flow Object .....	269
7-73. Uncommon Characteristics of the Multi-line-inline-note Flow Object.....	269
7-74. Common Characteristics of the Multi-line-inline-note Flow Object.....	270
7-75. Uncommon Characteristics of the Emphasizing-mark Flow Object.....	270
7-76. Common Characteristics of the Emphasizing-mark Flow Object .....	271
7-77. Ports of the Math-sequence Flow Object.....	271
7-78. Uncommon Characteristics of the Math-sequence Flow Object .....	271
7-79. Ports of the Unmath Flow Object .....	271
7-80. Uncommon Characteristics of the Unmath Flow Object.....	271
7-81. Common Characteristics of the Unmath Flow Object.....	272

7-82. Ports of the Script Flow Object .....	272
7-83. Uncommon Characteristics of the Script Flow Object .....	273
7-84. Ports of the Mark Flow Object .....	274
7-85. Uncommon Characteristics of the Mark Flow Object .....	274
7-86. Ports of the Fence Flow Object .....	275
7-87. Uncommon Characteristics of the Fence Flow Object .....	275
7-88. Ports of the Fraction Flow Object .....	275
7-89. Uncommon Characteristics of the Fraction Flow Object .....	276
7-90. Ports of the Radical Flow Object .....	276
7-91. Uncommon Characteristics of the Radical Flow Object .....	277
7-92. Ports of the Math-operator Flow Object .....	277
7-93. Uncommon Characteristics of the Math-operator Flow Object .....	278
7-94. Ports of the Grid Flow Object .....	278
7-95. Uncommon Characteristics of the Grid Flow Object .....	278
7-96. Ports of the Grid-cell Flow Object .....	279
7-97. Uncommon Characteristics of the Grid-cell Flow Object .....	280
7-98. Ports of the Scroll Flow Object .....	280
7-99. Uncommon Characteristics of the Scroll Flow Object .....	280
7-100. Common Characteristics of the Scroll Flow Object .....	281
7-101. Ports of the Multi-mode Flow Object .....	281
7-102. Uncommon Characteristics of the Multi-mode Flow Object .....	281
7-103. Ports of the Link Flow Object .....	282
7-104. Uncommon Characteristics of the Link Flow Object .....	282
7-105. Ports of the Marginalia Flow Object .....	283
7-106. Uncommon Characteristics of the Marginalia Flow Object .....	283
7-107. Flow Object Classes .....	301
A-1. Extended Characteristics of line-field .....	310
A-2. Extended Characteristics of link .....	310
A-3. Extended Characteristics of display-group .....	311
A-4. Extended characteristics of external-graphic .....	312
A-5. Extended characteristics of sideline .....	312
A-6. Extended characteristics of superscript .....	313
A-7. Extended characteristics of subscript .....	313
A-8. Extended common characteristics .....	313
A-9. Extended characteristics of table-cell .....	314
A-10. Extended Characteristics of table-row .....	314
A-11. Extended common characteristics .....	314
A-12. Extended common characteristics .....	314
A-13. Extended common characteristics .....	315
A-14. Extended common characteristics .....	315
A-15. Extended characteristics of column-set-sequence .....	315



# List of Figures

1-1. DSSSL conceptual model .....	2
3-1. Subclasses of quantity .....	25
4-1. Dependencies Between Modules.....	61
4-2. Default grove plan for the formatting process .....	95
4-3. Default grove plan for the transformation process .....	96
5-1. Base grove .....	108
6-1. The transformation process .....	142
6-2. Insertion of a new empty element into another empty element.....	153
6-3. Insertion of an empty element between siblings .....	154
6-4. Inclusion of an intermediate element.....	156
6-5. Inclusion of a new attribute in an element.....	157
6-6. Modification of an attribute value.....	159
6-7. Suppression of an attribute .....	160
6-8. Suppression of an intermediate element.....	161
7-1. The style process .....	174
7-2. Diagram of an area container.....	180
7-3. Placement of display areas in area containers .....	181
7-4. Diagram of a displayed area .....	181
7-5. Diagram of an inline area .....	182
7-6. Formation of lines with inline areas .....	182
7-7. Page Numbering .....	203
7-8. Diagram of the Simple-page-sequence Flow Object.....	204
7-9. Page model .....	208
7-10. Spread .....	209
7-11. Diagram of the Column-set-sequence Flow Object.....	212
7-12. Column-set-sequence Configurations.....	213
7-13. Column zones .....	214
7-14. Diagram of the Decoration-area Flow Object .....	223
7-15. Diagram of the Paragraph Flow Object .....	228
7-16. Line Spacing in the Paragraph Flow Object.....	229
7-17. Min-leading in the Paragraph Flow Object .....	229
7-18. Line Areas Intersecting.....	229
7-19. Conditional Spaces .....	230
7-20. First Line Spacing.....	230
7-21. Table-cell Diagram .....	243
7-22. Implicit Row Formation .....	243
7-23. Cell Crossing .....	243
7-24. Table Float-outs .....	244
7-25. Table with Table-part.....	245
7-26. Table without Table-part.....	246
7-27. Diagram of the Sideline Flow Object.....	247
7-28. Diagram of the Leader Flow Object .....	256
7-29. Diagram of the Box Flow Object .....	258
7-30. Diagram of the Score Flow Object.....	260
7-31. Diagram of the Rule Flow Object.....	264
7-32. Diagram of the Embedded-text Flow Object.....	266

7-33. Diagram of the Multi-line-inline-note Flow Object .....	270
7-34. Diagram of the Script Object.....	273
7-35. Diagram of the Mark Flow Object.....	274
7-36. Diagram of the Fence Flow Object.....	275
7-37. Diagram of the Fraction Flow Object.....	276
7-38. Diagram of the Radical Flow Object.....	277
7-39. Diagram of the Math-operator Object .....	278
7-40. Diagram of the Grid Flow Object.....	279
A-1. Process Flow .....	309

# Chapter 1. Introduction

DSSSL (Document Style Semantics and Specification Language) is an ISO standard (ISO/IEC 10179:1996) published in the year 1996.

DSSSL is a standard of the SGML family (Standard Generalized Markup Language, ISO 8879:1986), whose aim is to establish a processing model for SGML documents. For a good understanding of the SGML standard, many books exist including Author's guide[Bryan1988] and The SGML handbook[Goldfarb1990].

A DSSSL document is an SGML document, written with the same rules that guide any SGML document. The structure of a DSSSL document is explained in Chapter 2.

DSSSL is based, in part, on scheme, a standard functional programming language. The DSSSL subset of scheme along with the procedures supported by DSSSL are explained in Chapter 3.

The DSSSL standard starts with the supposition of a pre-existing SGML document, and offers a series of processes that can be performed on it:

- Groves

The first process that is performed on an SGML document in DSSSL is always the analysis of the document and the creation of a grove.

The DSSSL standard shares many common characteristics with another standard of the SGML family, HyTime (ISO/IEC 10744). These standards were developed in parallel, and their developers designed a common data model, the grove, that would support the processing needs of each standard.

Groves are the cornerstone of the cohesion between DSSSL and HyTime. Groves are an abstract data model for the representation of information contained in SGML documents. They also permit the manipulation of this information. They are explained in Chapter 4.

- Transformation

DSSSL offers a set of procedures capable of transforming the structure of an SGML document. In fact, transformations are not limited to documents, but operate on the internal representation of those documents in form of a grove. The result of the transformation is converted into a SGML document. The transformation process allows the addition of new information to the grove, deletion of parts of the grove, or modification of the structure and order of the parts of the grove, giving as result a grove that can differ greatly from the input. The transformation process is explained in Chapter 6.

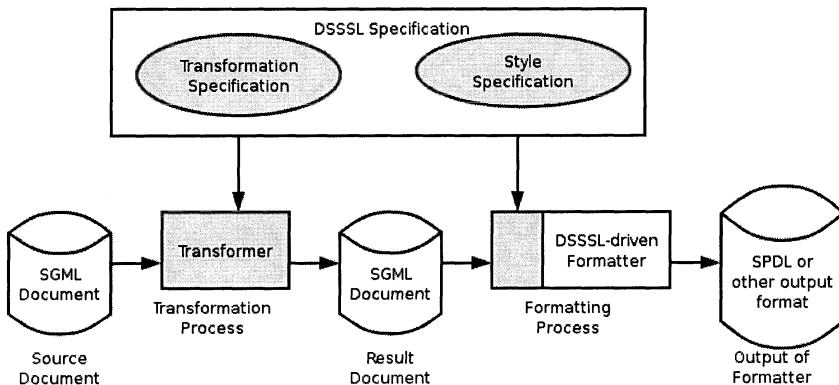
- Formatting

SGML is a standard oriented to the structural and semantic mark-up of information in documents. Although mark-up is important for information management, another important aspect in the processing of a document is the generation of something readable that can transmit ideas to a potential reader. Format and typography play an important role in enhancing the legibility of a document by distinguishing parts of the text from one another. DSSSL offers one of the most powerful and versatile solutions for the formatting of SGML documents. It is explained in Chapter 7.

- Query

DSSSL defines a query language capable of searching and finding information in a grove. This is equivalent to treating a SGML document as though it were a database. This component is used as much for performing transformations as for giving style to a document. Although it is not offered as a standalone component, the query component has interest on its own, and could well be used for complex queries outside of transformation and style processes. It is explained in Chapter 5.

**Figure 1-1. DSSSL conceptual model**



The above diagram shows the components of the DSSSL processing model. The shaded areas indicate the components that are standardized by DSSSL. DSSSL also defines a programming language that can be used for all these processes in a uniform way.