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CSS OR XSL-FO: WHICH SHOULD I USE FOR PRODUCING PRINT PUBLICATIONS?



A Data Usability Company
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CSS or XSL-FO: which should I use for producing print publications?

Michael Miller

Vice President

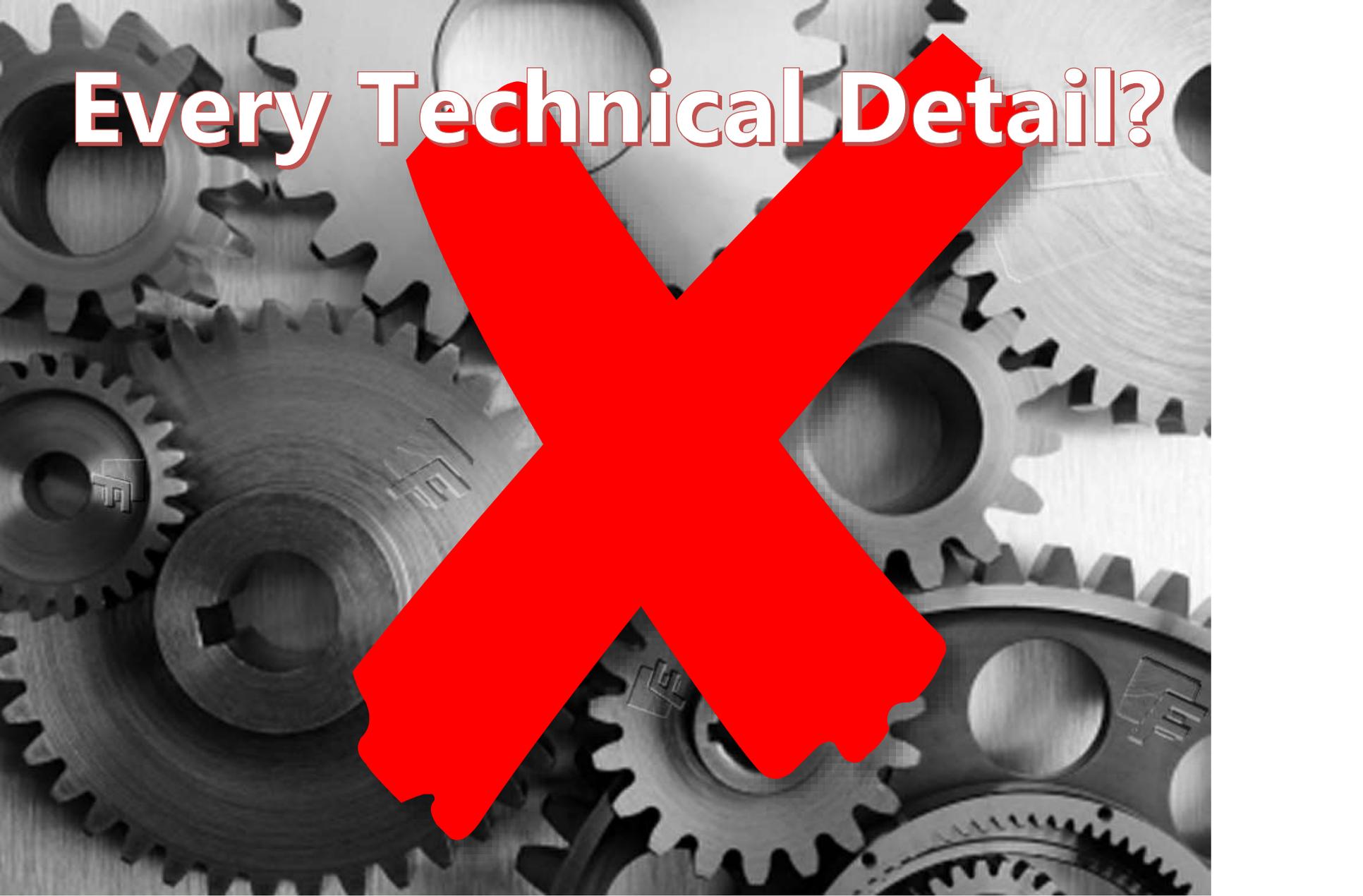
Antenna House, Inc.

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Is This A Marketing Talk?

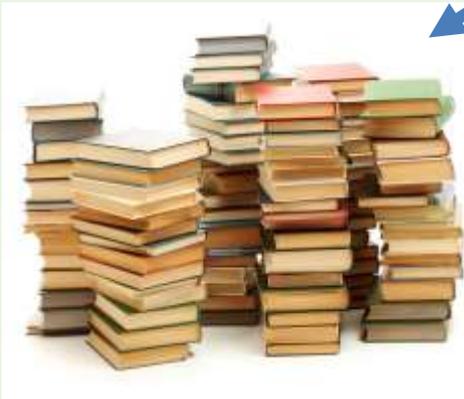
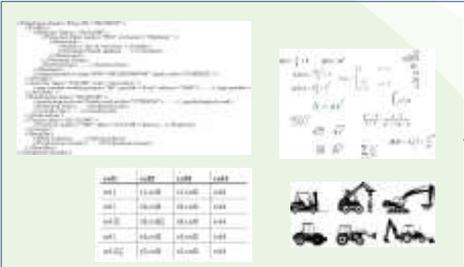




Every Technical Detail?



100% automated document formatting

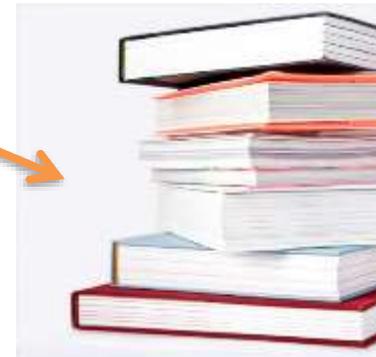
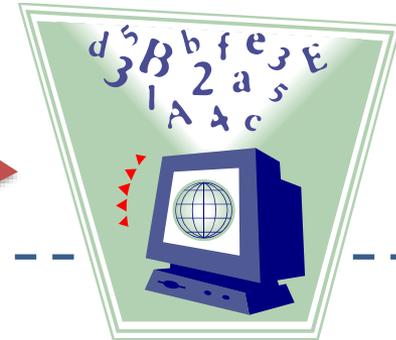
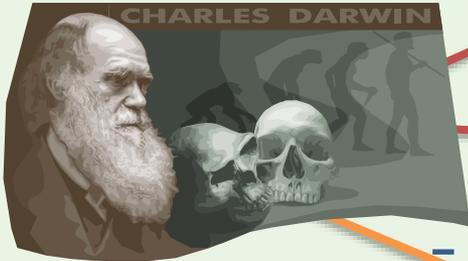


CSS and XSL-FO

- **Cascading Style Sheets (CSS)**
 - *Used mainly for the web*, is a style sheet language to describe the presentation (that is, the look and formatting) of a document written in HTML, XHTML and XML.

 - **Extensible Stylesheet Formatting Objects (XSL-FO)**
 - *Used for print*, is a pagination markup language describing a rendering vocabulary capturing the semantics of formatting information for paginated presentation.
- Both from W3C

The Challenge



Our focus here is the printed/PDF document

Alphabet Soup for documents and print



Page Description

- AFP
- HP-GL
- PDL
- PDF
- PostScript
- XPS
- MODCA

Markup

- CSS
- XSL-FO
- troff
- TeX
- LaTeX
- HTML
- HTML5
- XML
- SGML
- XHTML

Schemas/DTD/Data Model

- **DITA** (Darwin Information Typing Architecture) – some of the uses include software, product, and training documentation.
- **DocBook** – format for technical (but not only) manuals and documentation.
- **S1000D** – international specification for technical documentation related to commercial or military; aerospace, sea or land; vehicles or equipment.
- **JATS** (Journal Article Tag Suite) – a NISO standard of XML used to describe and publish STEM (scientific/technical/engineering/medical) scholarly journal articles
- **TEI** (Text Encoding Initiative) – Guidelines for text encoding in the humanities, social sciences and linguistics.

Aspects of a printed publication

Content formatted into pages with

- Front Matter
 - Title page
 - Table of contents
 - List of figures
 - Introduction/Foreword
- Body
 - Chapters
 - Paragraphs
 - Tables
 - Graphics
 - Captions
 - Footnotes
- Back Matter
 - Index
 - Appendices
 - References/Bibliography

Aspects of a printed page

- Margins
- Headers and Footers
 - Page Numbers
 - Running Heads
- Body Text
 - Headings and Subheadings
 - Images and Graphics
 - Tables
 - Equations
 - Captions and Labels
- Page Breaks
- Borders and Rules

Challenges:

- Typesetting, page and document layout is a complex crafts that draw from a wide variety of disciplines including art, technology, psychology, etc.
- It has always been difficult to produce high-quality, high-volume print output from XML and SGML
- Historically, this has required a significant financial investment in specialized typesetting tools, (e.g. Advent 3B2, Datalogics Composer, Miles 33, Arbortext Publisher, Xyvision XPP, TeX, etc.)
- These tools have a steep learning curve due to often cryptic, proprietary stylesheet languages or typesetting codes.
- They are proprietary.

Enter XSL-FO and CSS

Motivation: The Business Case for XML, CSS and XSL-FO

What you want:

- High quality, consistent output ⇒ “look and feel”, “branding”
- Automated production of information products ⇒ Reduced cost, rapid dissemination
- Supports re-purposing of content ⇒ “single-source publishing”
- Supports the investment in content rather than presentation ⇒ “separation of content from formatting”
- Independent of any particular application ⇒ “portability”
- Availability of resources ⇒ “non-proprietary skills, languages”

The benefits of a standardized format for data and presentation are overwhelming. They include

- complete interoperability of both content and style across applications and platforms;
- freedom of content creators from vendor control of production tools;
- freedom of users to choose their own views into content;
- easy construction of powerful tools for manipulating content on a large scale;
- a level playing field for independent software developers; and
- true international publishing across all media.

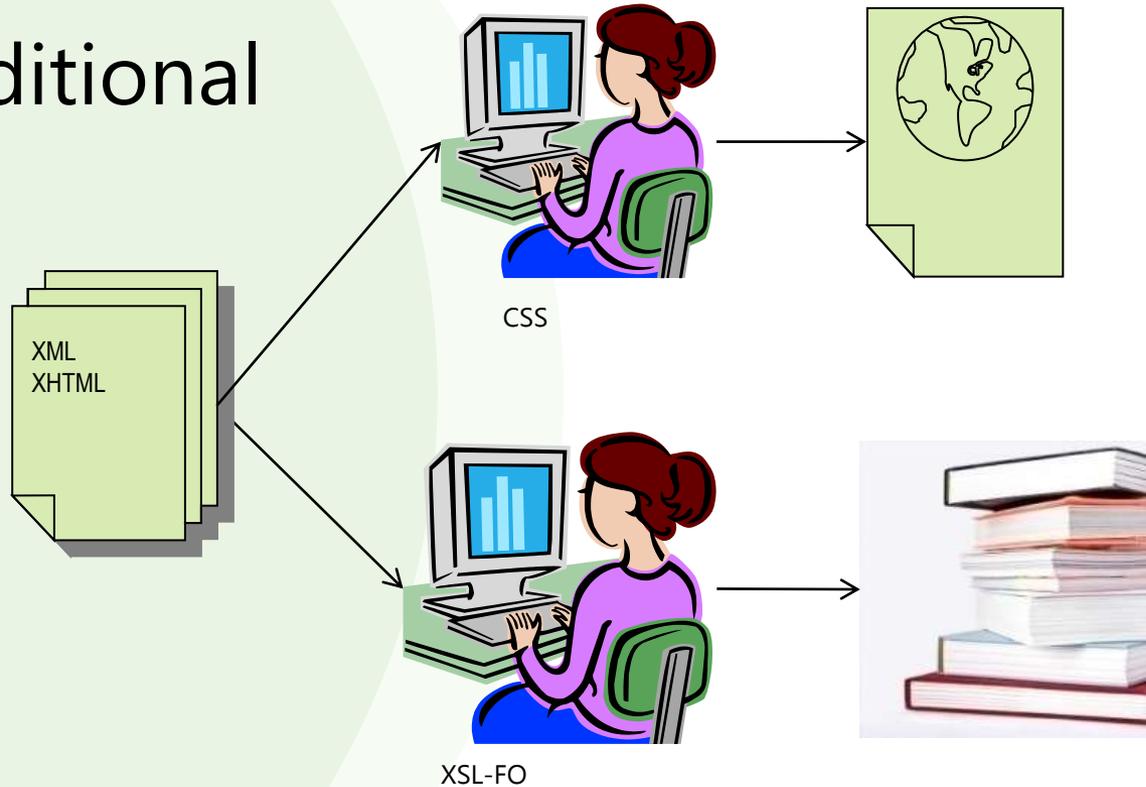
XSL-FO

(Extensible Stylesheet Formatting Objects)

This is the part of XSL that deals with how structured information should be presented in print.

Content to Web & Print/PDF

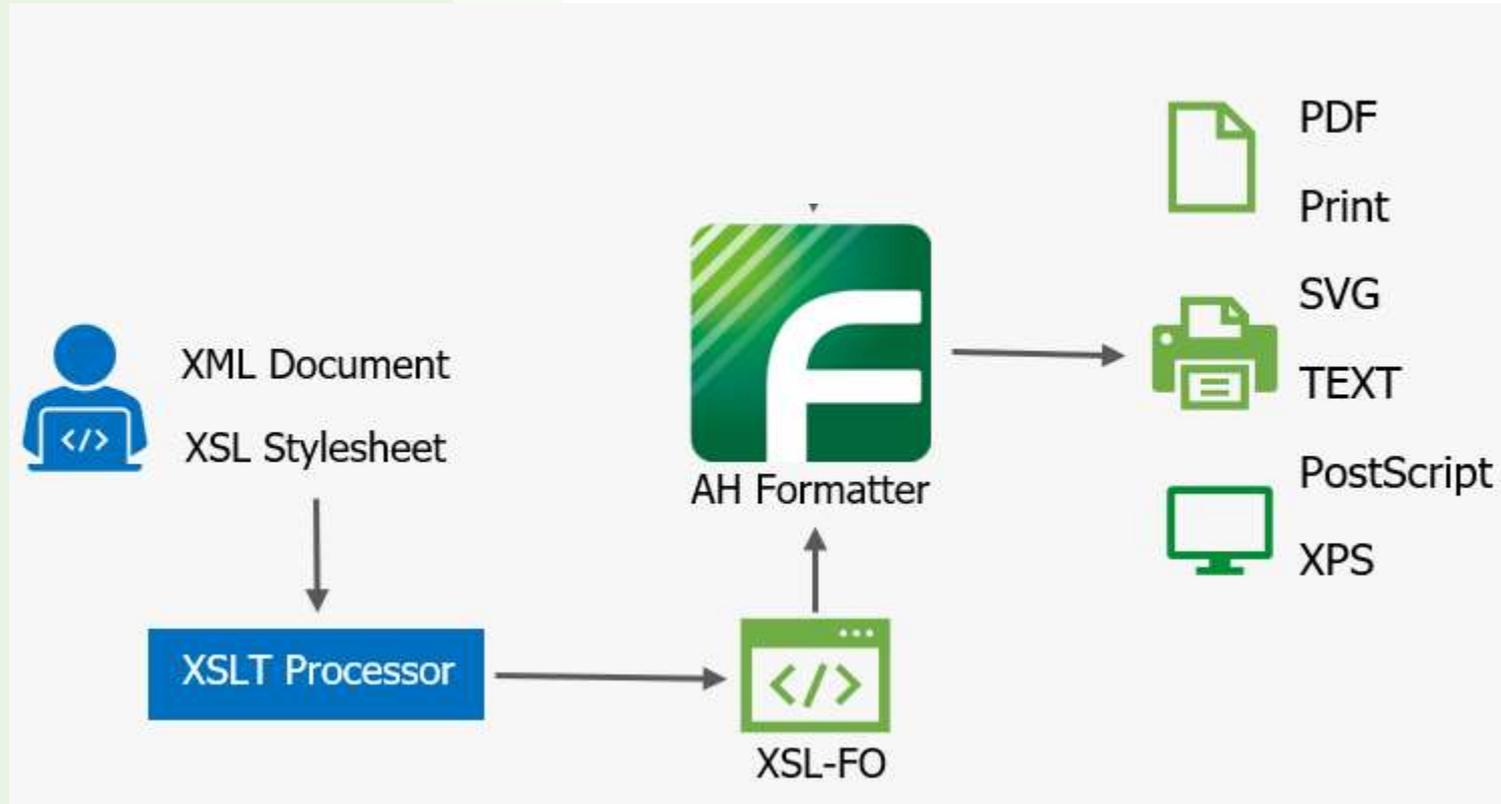
- Traditional



XSLT

- **XSLT (Extensible Stylesheet Language Transformations)** is a language for transforming XML documents into other XML documents, or other formats such as HTML for web pages, plain text or **XSL Formatting Objects**, which may subsequently be converted to other formats, such as PDF, PostScript and PNG.

Typical XML publishing data flows



Some of what is documented with XSL-FO



Current Document Formatting for Print

- PDF through XSL-FO
 - Antenna House
 - FOP
 - XEP
- Other options
 - Framemaker
 - InDesign

From the beginning

- CSS

- Cascading Style Sheets
- W3C Recommendation
- Originally
 - Simple mechanism for adding style (fonts, color, spacing to web documents
 - CSS1 – W3C Recommendation 17 Dec 1996
 - CSS 2.1 Revision 1 – Proposed Recommendation 12 April 2011
- Now
 - Mechanism for both web and print documents
 - CSS 3

Wouldn't it be nice if you could also use CSS for print?

CSS3 adds page layout functionality for print

What is CSS3

- Web functionality +
 - CSS3 Module: Paged Media
 - W3C Working Draft 10 October 2006
 - CSS3 module: Generated Content for Paged Media
 - W3C Working Draft 4 May 2007

So Why CSS3?

CSS3 is an acknowledgement by the CSS Working Group that they needed to also address page formatting.

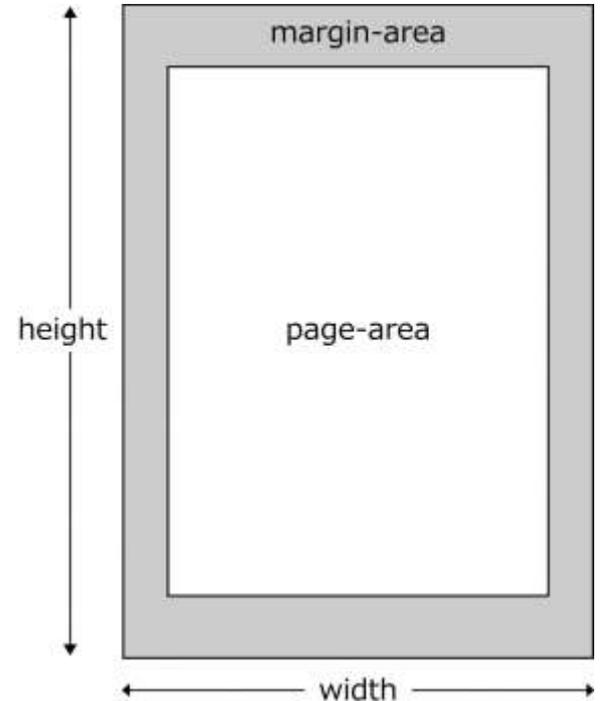
The “Cascading” Stylesheet

- CSS can have up to 3 levels of style information:
 - The default style
 - Style specified in a separate stylesheet
 - Style specified in the actual document or data

Examples of CSS3 within a stylesheet

Page setting @page rule

```
@page {  
  size: A4;  
  margin: 25mm;  
  @top-center {  
    content: "Sample";  
  }  
  @bottom-center {  
    content: counter(page);  
  }  
}
```



```
@page {  
  size: 4in 6in;  
}
```

```
@page {  
  size: letter landscape;  
}
```

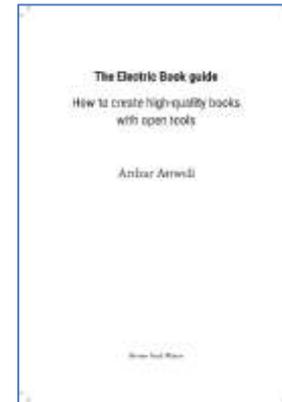
CSS3 Module: Paged Media adds

- [Running headers and footers](#)
 - [Leaders](#)
 - [Cross-references](#)
 - [Footnotes](#)
 - [Sidenotes](#)
 - [Named flows](#)
 - [Hyphenation](#)
 - [New counter styles](#)
 - [Character substitution](#)
 - [Image resolution](#)
 - [Page floats](#)
- [Advanced multi-column layout](#)
 - [Conditional content](#)
 - [Crop and cross marks](#)
 - [Bookmarks](#)
 - [CMYK colors](#)
 - [Continuation markers](#)
 - [Change bars](#)
 - [Line numbers](#)
 - [Named page lists](#)
 - [Generated lists](#)
 - [TOC](#)
 - [Glossary](#)
 - [Index](#)

- Page Boxes: the @page Rule
 - Page Terminology and the Page Model
 - Page types
 - Page size
 - Page Selectors and the Page Context
 - Page Properties
 - Left, right, and first pages
 - Content outside the page box
- Margin Boxes
 - At-rules for margin boxes
 - Maximum Dimension of margin boxes
 - Dimension of margin boxes
 - Margin boxes and default values
 - Margin box examples
 - Populating margin boxes

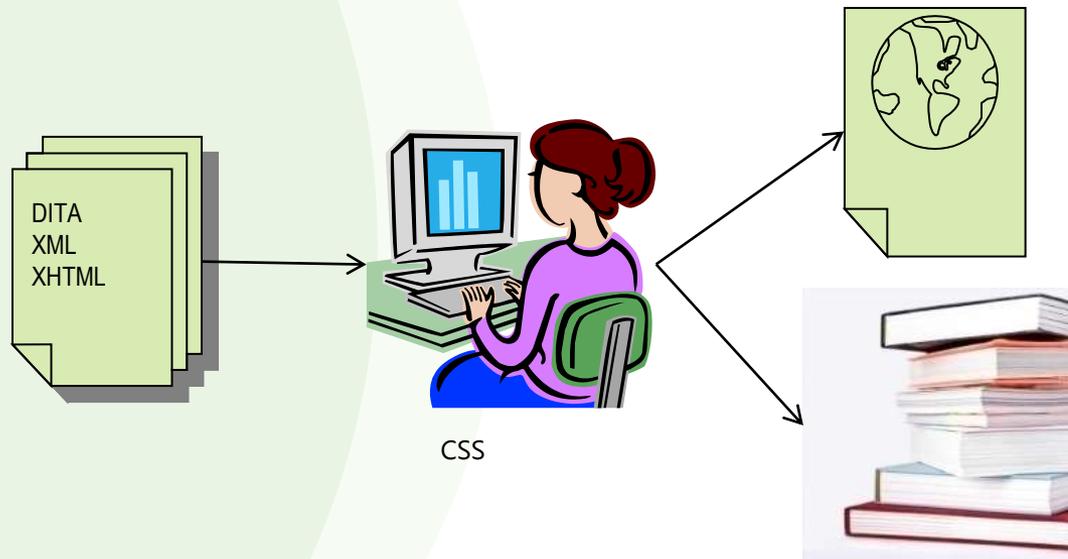
- Page Breaks
 - Break before/after elements: 'page-break-before', 'page-break-after', 'page-break-inside'
 - Using named pages: 'page'
 - Breaks inside elements: 'orphans', 'widows'
 - Allowed page breaks
 - Forced page breaks
 - "Best" page breaks
- Page-based Extensions to Counters
 - Page-based counters
- Orienting an Image on the Page
- The 'fit' and 'fit-position' Properties

Documents formatted with CSS

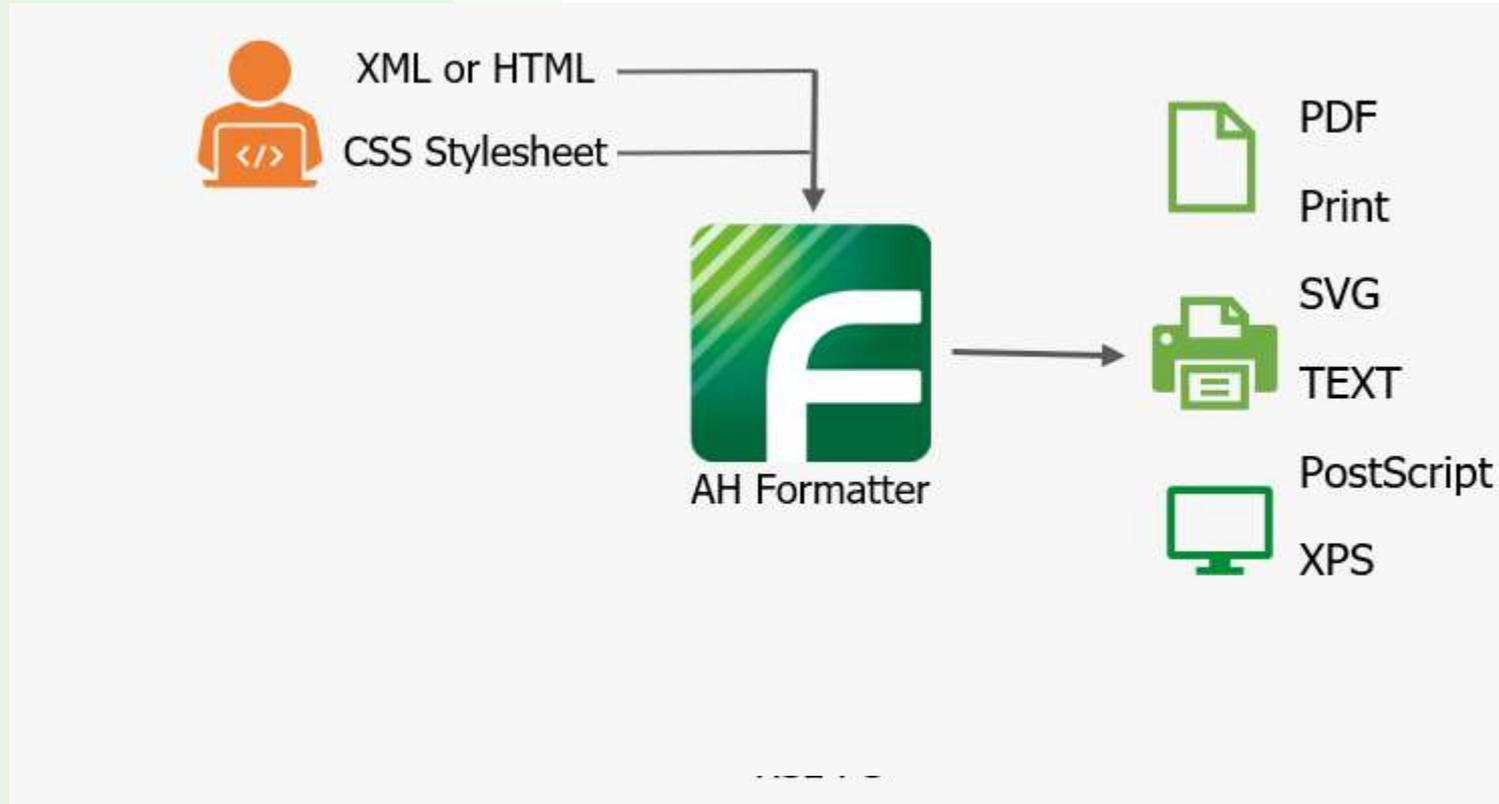


Content to Web & Print/PDF

- With CSS



Typical CSS publishing data flows



CSS Options

- Antenna House CSS Formatter
- Prince XML
- PDFreactor
- Pagination.js
- Simplepagination.js

Now there is a choice!
CSS or XSL-FO

Why two Stylesheet Languages?

- XSL-FO came first along with several products based on the standard.
- A reasonable open source implementation.
- Thousands of implementations based on XSL-FO.
- A large number of available Stylesheets
 - – DITA, DocBook, JATS
- CSS paged media is relatively new by comparison.
- The CSS products that support paged output are now becoming available.
- Awareness of CSS for paged media is increasing

	CSS	XSL-FO
Can be used with HTML?	Yes	No
Can be used with XML?	Yes	Yes
Transform language?	No	Yes
Syntax	CSS	XML

Spread produced with XSL-FO

Far far away, behind the word mountains, far from the countries Vokalia and Consonantia, there live the blind texts. Separated they live in Bookmarksgrove right at the coast of the Semantics, a large language ocean. A small river named Duden flows by their place and supplies it with the necessary regalia. It is a paradisiatic country, in which roasted parts of sentences fly into your mouth. Even the all-powerful Pointing has no control about the blind texts it is an almost unorthographic life.

thead
1
2
3
4
5

6
7
8
9
10
tfoot

One day however a small line of blind text by the name of Lorem Ipsum decided to leave for the far World of Grammar. The Big Oxmox advised her not to do so, because there were thousands of bad Commas, wild Question Marks and devious Semikoli, but the Little Blind Text didn't listen. She packed her seven versalia, put her initial into the belt and made herself on the way.

壹 One
貳 Two
參 Three
肆 Four

When she reached the first hills of the Italic Mountains¹, she had a last view back on the skyline of her hometown Bookmarksgrove, the headline of Alphabet Village and the subline of her own road, the Line Lane. Pityful a rethoric question ran over her cheek, then she continued her way.

On her way she met a copy. The copy warned the Little Blind Text, that where it came from it would have been rewritten a thousand times and

everything that was left from its origin would be the word "and" and the Little Blind Text should turn around and return to its own, safe country. But nothing the copy said could convince her and so it didn't take long until a few insidious Copy Writers ambushed her, made her drunk with Longe and Parole and dragged her into their agency, where they abused her for their projects again and again. And if she hasn't been rewritten, then they are still using her.

¹ Far far away, behind the word mountains, far from the countries Vokalia and Consonantia, there live the blind texts. Separated they live in Bookmarksgrove right at the coast of the Semantics, a large language ocean. A small river named Duden flows by

their place and supplies it with the necessary regalia. It is a paradisiatic country, in which roasted parts of sentences fly into your mouth. Even the all-powerful Pointing has no control about the blind texts it is an almost unorthographic life.

Spread produced with HTML+CSS

Far far away, behind the word mountains, far from the countries Vokalia and Consonantia, there live the blind texts. Separated they live in Bookmarksgrove right at the coast of the Semantics, a large language ocean. A small river named Duden flows by their place and supplies it with the necessary regalia. It is a paradisiacal country, in which roasted parts of sentences fly into your mouth. Even the all-powerful Pointing has no control about the blind texts it is an almost unorthographic life.

thead
1
2
3
4
5

6
7
8
9
10
tfoot

One day however a small line of blind text by the name of Lorem Ipsum decided to leave for the far World of Grammar. The Big Oxmox advised her not to do so, because there were thousands of bad Commas, wild Question Marks and devious Semikoli, but the Little Blind Text didn't listen. She packed her seven versalia, put her initial into the belt and made herself on the way.

壹、One
貳、Two
参、Three

四、Four

When she reached the first hills of the Italic Mountains¹, she had a last view back on the skyline of her hometown Bookmarksgrove, the headline of Alphabet Village and the subline of her own road, the Line Lane. Pityful a rethoric question ran over her cheek, then she continued her way.

On her way she met a copy. The copy warned the Little Blind Text, that where it came from it would have been re-

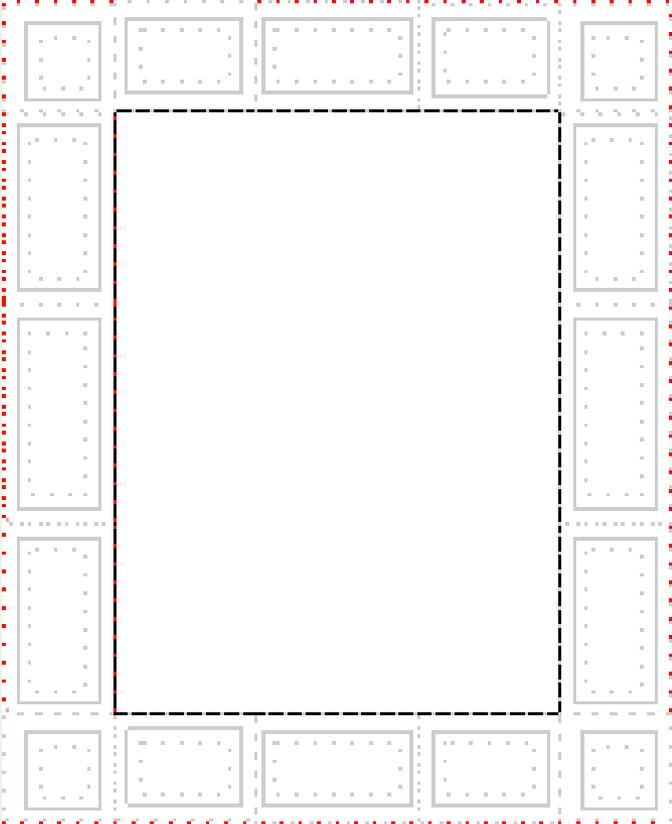
written a thousand times and everything that was left from its origin would be the word "and" and the Little Blind Text should turn around and return to its own, safe country. But nothing the copy said could convince her and so it didn't take long until a few insidious Copy Writers ambushed her, made her drunk with Longe and Parole and dragged her into their agency, where they abused her for their projects again and again. And if she hasn't been rewritten, then they are still using her.

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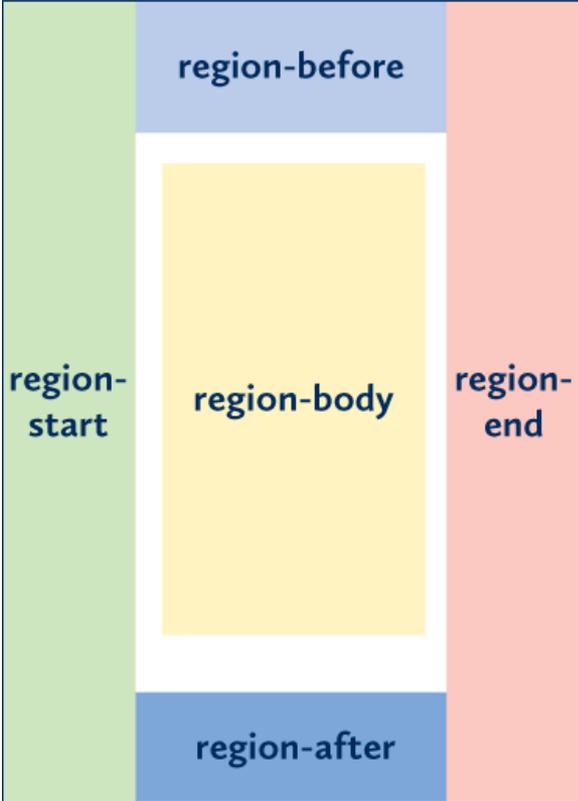
their place and supplies it with the necessary regalia. It is a paradisiacal country, in which roasted parts of sentences fly into your mouth. Even the all-powerful Pointing has no control about the blind texts it is an almost unorthographic life.

XSL-FO to CSS: Headers & Footers

CSS



XSL-FO



XSL-FO has more ways to choose

- odd-or-even
- blank-or-not-blank
- page-position: first | last | only | rest | any
- Maximum number of repeats
- Change conditions after set number of pages

CSS has different way to choose

```
@page narrow { size: 9cm 18cm }
```

```
@page rotated { size: landscape }
```

```
div { page: narrow }
```

```
table { page: rotated }
```

```
...
```

```
<div>
```

```
<table>...</table>
```

```
<table>...</table>
```

```
<p>This text is rendered on a 'narrow' page</p>
```

```
</div
```

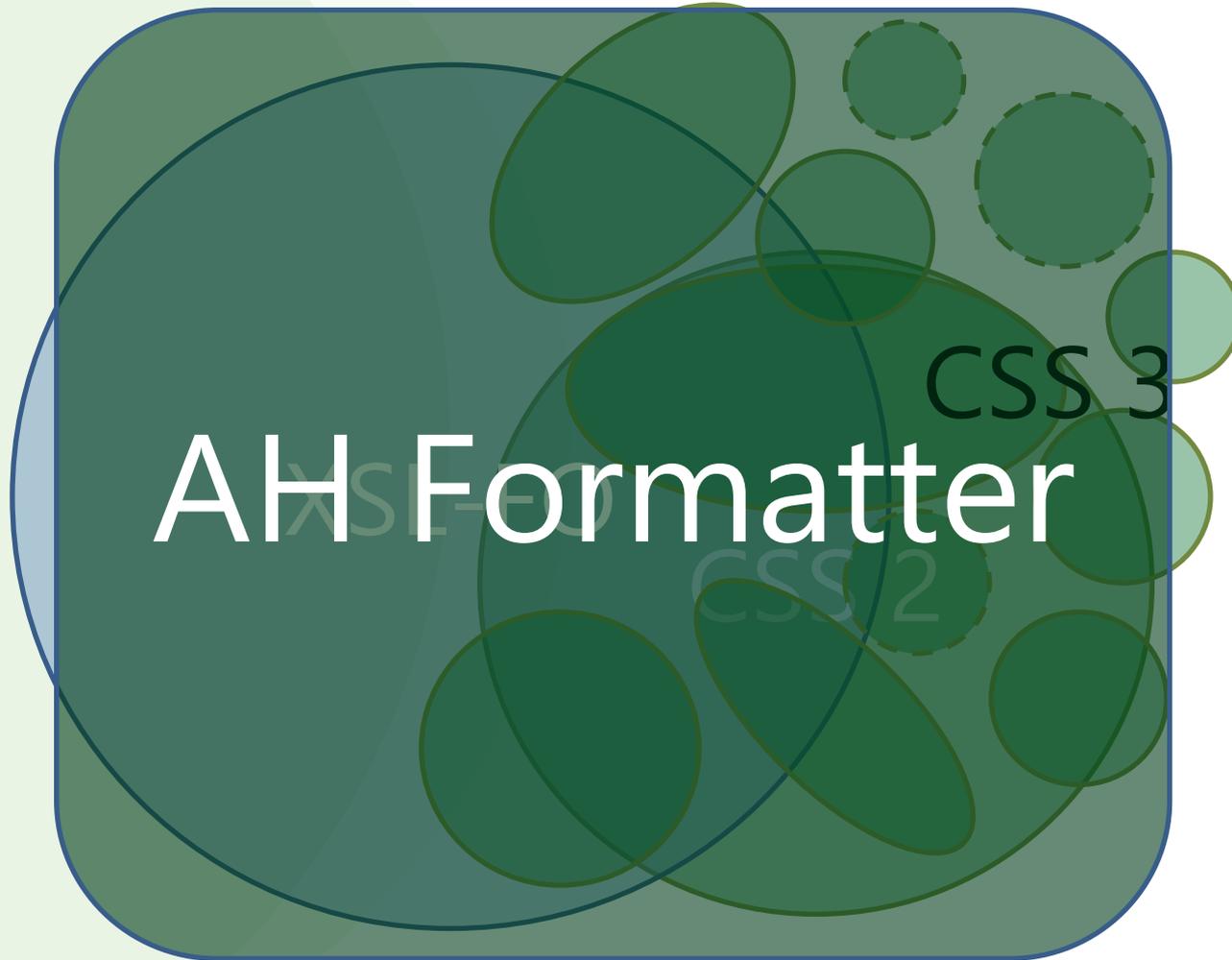
XSL-FO fo:layout-master-set

```
<fo:layout-master-set>
  <fo:simple-page-master master-name="left">
    ...
  </fo:simple-page-master>
  <fo:simple-page-master master-name="right">
    ...
  </fo:simple-page-master>
  <fo:page-sequence-master master-name="psm">
    <fo:repeatable-page-master-alternatives>
      <fo:conditional-page-master-reference
        master-reference="left"
        odd-or-even="even"/>
      <fo:conditional-page-master-reference
        master-reference="right"
        odd-or-even="odd"/>
    </fo:repeatable-page-master-alternatives>
  </fo:page-sequence-master>
</fo:layout-master-set>
```

CSS @page rule

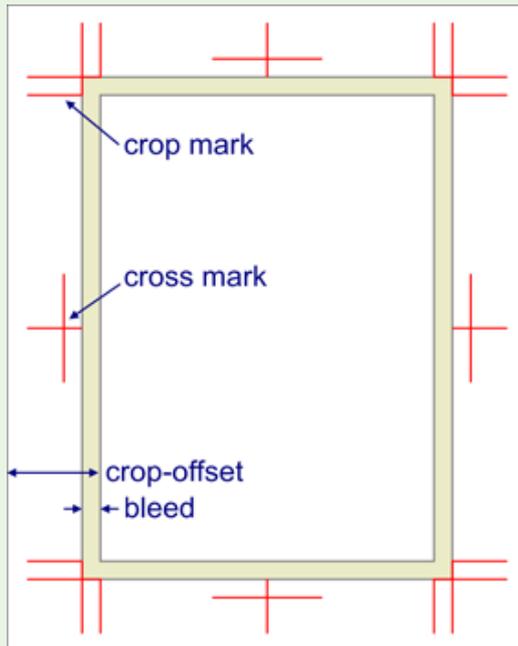
```
@page {  
  size: 120mm 140mm;  
  @footnote {  
    float: bottom page;  
    width: 100%;  
  }  
}  
  
@page :right {  
  @bottom-right {  
    content: counter(page) " of " counter(pages);  
  }  
}  
  
@page :left {  
  @bottom-left {  
    content: counter(page) " of " counter(pages);  
  }  
}
```

XSL-FO and CSS overlap



Extensions

- extensions add features that are not part of the core specification.



fo / CSS

axf:crop-offset / ah-crop-offset

axf:crop-offset-top / ah-crop-offset-top

axf:crop-offset-bottom / ah-crop-offset-bottom

axf:crop-offset-left / ah-crop-offset-left

axf:crop-offset-right / ah-crop-offset-right

XSL/CSS Properties List

The following table shows XSL-FO properties and their corresponding CSS properties. A blank cell indicates that no corresponding CSS property is implemented for the XSL-FO property, or vice-versa. See also [XSL-FO Conformance](#) or [CSS Conformance](#) to learn the current implementation status for each property. [CSS Conformance](#) also defines the CSS module abbreviations, such as [CSS3-GCPM] etc., that are used in the table. Showing properties as corresponding does not always mean that their specifications in XSL-FO and CSS are completely aligned. Some correspondences just indicate that the properties are functionally equivalent or mostly similar.

XSL	CSS	Description
axf:abbreviation-character-count	-ah- abbreviation-character-count	Specifies the minimum number of characters considered to be an
7.6.1 absolute-position	[CSS2.1] position	
axf:action-type	-ah- action-type	
axf:additive-symbols	[CSS3-CounterStyle] (-ah-) additive-symbols	axf <axf.counter-style>
	[CSS2.1] vertical-align	
		[CSS3-Line] Setting the alignment point: the 'alignment-adjust' property
		[CSS3-Line] Aligning the alignment point of an element: the 'alignment-baseline' property
7.15.1 allowed-height-scale	-ah-allowed-height-scale	
7.15.2 allowed-width-scale	-ah-allowed-width-scale	
axf:alt-glyph	-ah- alt-glyph	Specifies the alternative glyph of a character.
axf:alt		Specifies the alternate text of the image.
axf:author		Specifies the author of the annotation. V6.2MR2 no-LT

'axf:' prefix + '-ah-' prefix
AH Formatter Extension

'axf:' prefix + CSS specification
CSS in XSL-FO

XSL section no. + '-ah-' prefix
XSL-FO in CSS

XSLT can transform XML documents into XSL-FO

- Sort lists within documents
- Replace text
- Rearrange content

CSS does not use XSLT

- But it can
 - For back of the book indexes

Organizations can optimize the creation and publishing of documentation to address business requirements

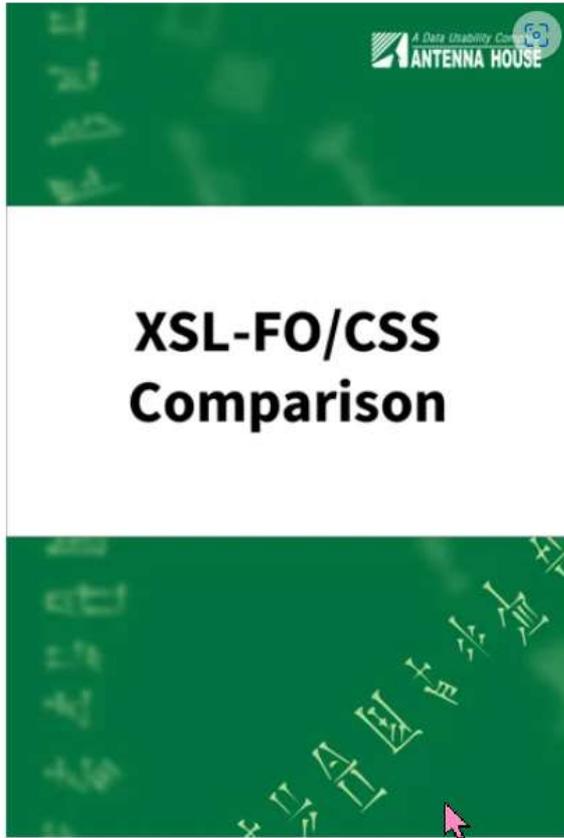
- Pressures
 - Shorter documentation development schedules
- Actions
 - Publish in multiple delivery formats (paper, electronic and web)
 - Provide real time customization at the point of interaction
- Capabilities
 - Single source authoring of documentation
 - Automated publication of documentation through captured logic
 - Localization
 - Graphics
- Enablers
 - Structured authoring applications
 - Content management systems
 - Integration of structured authoring application and content management systems.

CSS3 and XSL-FO can be an important component of this!!

Benefits of CSS3 as part of an implementation

- Enable the use of the same authoring and publishing solution for both web and paper
 - Reduce the cost of technology investment
 - Enable vendors to compete and provide standards based solutions
 - Create efficiency by reducing duplicate processes
 - Reduce vendor or IT support
 - Eliminate data transformation between different specifications
 - Overall cost savings with respect to system maintenance, upgrade, training, etc.

XSL-FO & CSS Comparison Guide



XSL-FO/CSS Comparison

By Antenna House, Inc.

Description

This publication that compares the XSL-FO and CSS specifications and provide information about applicable AH Formatter extensions is available in two identical versions. One was produced with Antenna House XSL Formatter and one with Antenna House CSS Formatter. This guide is intended for anyone that is:

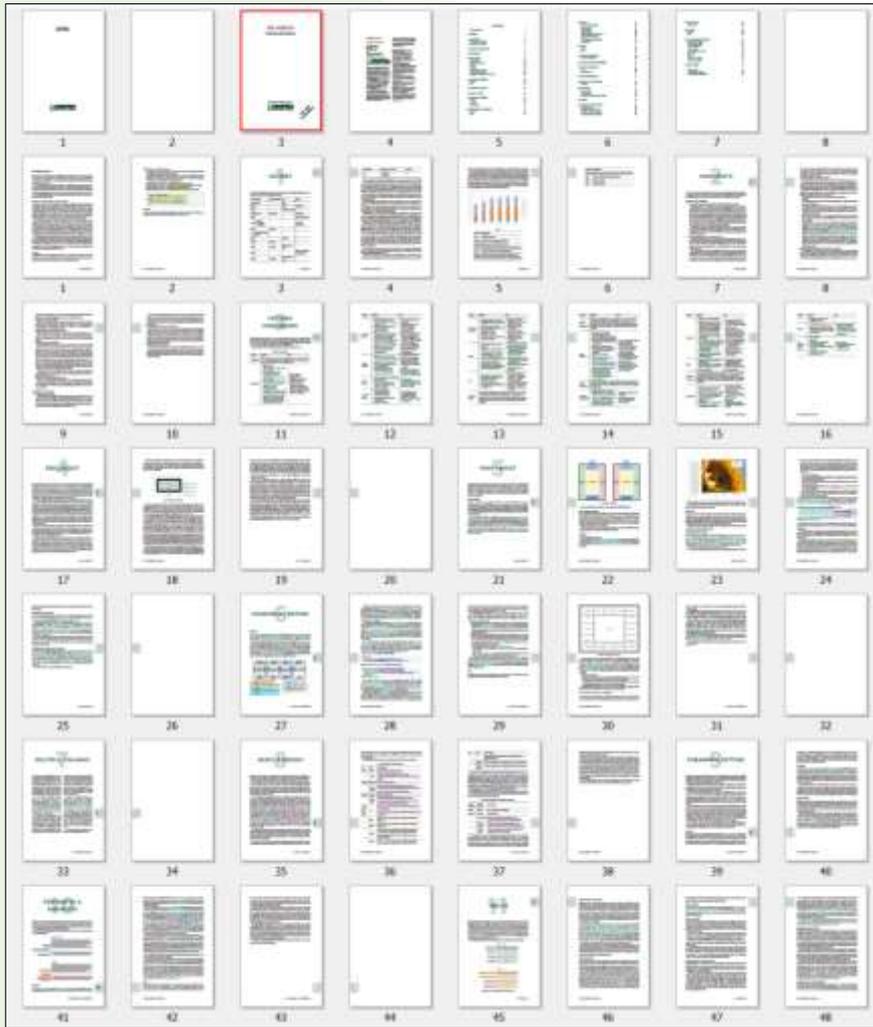
- Exploring whether to use XSL-FO or CSS
- Familiar with one formatting method and wants to learn more about the other
- Working with both and wants to see the differences

Downloads:

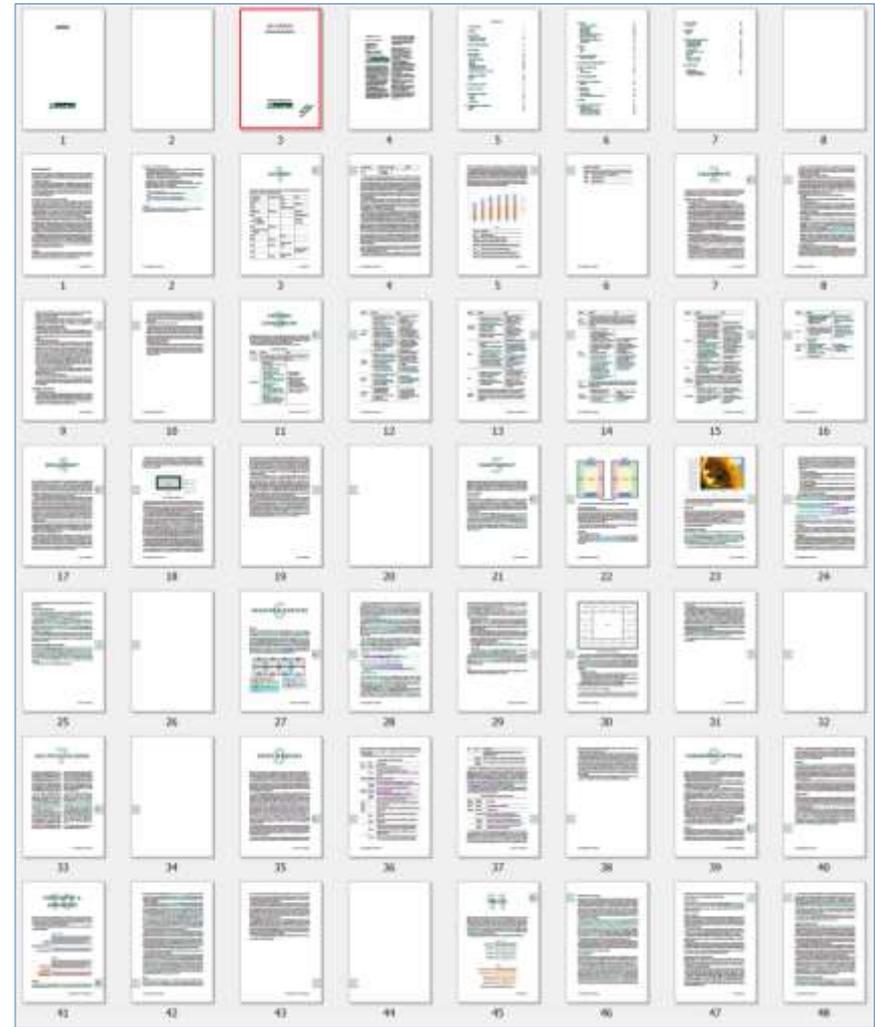
- [XSL-FO Formatted PDF](#)
- [CSS Formatted PDF](#)
- [XSL-FO & HTML + CSS Files](#)

[XSL-FO and CSS Comparison \(antennahouse.com\)](https://www.antennahouse.com/xsl-fo-css-comparison)

<https://www.antennahouse.com/xsl-fo-css-comparison>



CSS



XSL-FO

[XSL-FO and CSS Comparison
\(antennahouse.com\)](http://antennahouse.com)



CSS or XSL-FO

XSL-FO

- is now over 22 years old
- Can do complex document formatting

CSS3

- CSS3 paged output is over 15 years old
- Can do almost all the same level of complex document formatting

Use CSS when you can, use XSL when you must.

- Easier to use and easier to learn = easier to maintain and cheaper
- CSS simplicity means it has its limitations

What ChatGPT said

User: which is better xsl-fo or css for paged output?

ChatGPT: The choice between XSL-FO (Extensible Stylesheet Language Formatting Objects) and CSS (Cascading Style Sheets) for paged output depends on several factors, including the specific requirements of your project and your familiarity with each technology. Here are some considerations for comparing XSL-FO and CSS for paged output:

1. **Purpose:** XSL-FO was specifically designed for paged media and is well-suited for creating complex print layouts. It provides extensive control over page elements, such as page size, margins, headers, footers, and multi-column layouts. On the other hand, CSS was primarily developed for web styling, and while it has added support for paged media with the @page rule, it may not offer the same level of fine-grained control as XSL-FO for complex print layouts.
2. **Layout Complexity:** If you require advanced layout features like automatic table of contents, footnotes, cross-references, or indexes, XSL-FO offers more built-in capabilities for handling such requirements. XSL-FO provides specific formatting objects for these features, whereas achieving similar functionality with CSS may require additional scripting or workarounds.
3. **Learning Curve:** CSS is widely used for web styling and has a large community and extensive documentation available. If you are already familiar with CSS, leveraging CSS for paged output may be more straightforward and require less learning effort. XSL-FO, on the other hand, has a narrower focus and may require some additional learning if you are not already familiar with it.
4. **Tooling Support:** CSS enjoys broader tooling support due to its widespread use in web development. There are numerous CSS preprocessors, frameworks, and layout libraries available that can simplify styling tasks. XSL-FO tooling may be more limited, and dedicated XSL-FO processors or tools might be necessary for generating the desired output.
5. **Integration with Other Technologies:** If your project involves XML-based workflows or XSLT (XSL Transformations), using XSL-FO can provide seamless integration as both XSL-FO and XSLT are part of the same family of technologies. This integration can be beneficial when generating print-ready output from XML sources.

In summary, if your focus is primarily on creating complex print layouts with extensive control over page elements, XSL-FO may be a better choice. However, if your requirements are relatively simple or if you are already familiar with CSS and want to leverage existing web technologies, CSS with @page rule support can be a viable option for paged output. Consider the specific needs of your project, your familiarity with the technologies, and the available tooling when making your decision.



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ANTENNA HOUSE

Questions?

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