Dr. StrangeBook

or: How I Learned to Stop Worrying and Love XML

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What am I going to talk about?

▶ Document publication in web and print formats using XML as the base source.
▶ Used for many course documents:
  ▶ Currently INFO 321 and INFO 405
  ▶ INFO 212 is next
What am I going to talk about?

The initial stages

The second version of our authoring framework

Problems encountered

What you need to do this yourself

Where to next?
Aren’t you talking about DocBook?
Aren’t you talking about DocBook?

SH!

Not yet!
Disclaimer

This presentation was not produced from an XML document!

*Beamer* is much better at this for now.
But first, a word from our sponsors...

**Chris Edwards** did the entire first implementation and much of the basic infrastructure for the second version.

**Richard Pascoe** got me back into *LATEX* again, and also introduced it to Chris along with the idea of producing multiple output targets from the same source.

**Richard O’Keefe** presented a seminar on using SGML for exam papers, which got Chris thinking about using XML for document production.
What we wanted to do

- All course documents in the same source format.
- Cross-platform (at least Win32 & Mac OS X).
- Produce both print and HTML versions.
- Multiple versions of the same document:
  - Questions for students
  - Model answers for students
  - Notes for teachers
  - Individual documents vs. combined course handbook
We used to use Word...  
(→ ca. 1998)

- OK, but a typical Microsoft product.
- Print output typically pretty ugly; HTML even worse :(  
- Messy for managing questions vs. answers vs. notes.
...then we moved to \LaTeX...
(ca. 1999–2002)

- No GUI, but so what? It doesn’t have that !$@%ˆ$! paper clip.
- Beautiful print output.
- Web output mostly OK (\LaTeX2HTML), but still not ideal.
then Chris began to think about XML  
(late 2002)

- Content-neutral format.
- Potentially better HTML output using XSLT.
- We were starting to teach XML + XSLT anyway ⇒ good learning exercise!
So why didn’t you use DocBook?
So why didn’t you use DocBook?

SH!

I told you, not yet!!
The first version of the framework (S1 2003)

- Two monolithic XSL style sheets: XML → HTML, XML → \LaTeX{}.
- Existing \LaTeX{} tool chain for print output (\LaTeX{} [→ DVI → PS] → PDF).
Workflow for version 1

XML source

xml2html.xsl

XSLT processor

HTML source

CSS style sheet

Web browser

LaTeX source

latex2html.xsl

LaTeX tool chain

PDF document

CSS style sheet
But not all was well…

- Not designed for general documents (i.e., other than labs or tutorials).
- Two separate style sheets ⇒ harder to maintain consistency.
The second version of the framework
(2004)

- Single monolithic master format document combining both HTML and \LaTeX XSLT templates.
- Master format document processed through separate XSL master style sheets to produce XML → HTML & XML → \LaTeX style sheets.
- Generalised to other types of documents.
Workflow for version 2

Workflow diagram:
- Master XML file
- XML to HTML conversion
- HTML to PDF conversion
- LaTeX source
- PDF document
- CSS style sheet
- Web browser
- XSLT processor
- XML resolver
- LaTeX toolchain
- CSS style sheet
- Web browser
Features

- The usual paragraph formatting, etc.
- Moderately complex tabular structures (including multi-column & multi-row cells).
- Hyperlinks & cross-references.
- Floating matter (figures, tables).
- Images in various formats.
- Very basic maths.
- Conditional processing based on format (LaTeX/HTML).
- Raw code for that really crufty stuff.
- etc...
Examples
BUT WHAT ABOUT DOCBOOK?
BUT WHAT ABOUT DOCBOOK?

All right, all right!!
BUT WHAT ABOUT DOCBOOK?

- DocBook is a set of comprehensive SGML & XSL style sheets for producing technical computing documents from XML source, managed by OASIS. (see http://www.docbook.org/)
- Why didn’t we use it?
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- Why didn’t we use it? We didn’t know about it!
BUT WHAT ABOUT DOCBOOK?

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- Why didn’t we use it? We didn’t know about it!

- Our framework is remarkably similar but not quite as powerful.

- But we seem to do some things a little better :)

- Use formatting objects to output direct to PDF.
Problems encountered with version 2

- Sometimes need to be careful about white space.
- Sometimes things just don’t work ⇒ embedded raw code.
- LaTeX-only vs. HTML-only features can be a nuisance.
- Master format document needs to be modularised.
Platform issues

- Different TeX distributions (fpTeX vs. teTeX).
- Different XSLT processors (SAXON vs. Xalan-C vs. Xalan-Java) with different command-line conventions.
- Line breaks!
- Compatible vector drawing tools.
- Differing directory path conventions.
- Where to find the style sheets?
The essential software

- The XSL style sheets!
- XSLT processor (we use Apache Xalan or SAXON).
- A \TeX{} distribution (\text{teX}X).
- Something to edit XML with (GVim, BBEdit).
Nice to have

- GhostScript.
- GNU make.
- Vector drawing tool (Visio, OmniGraffle).
- Graphics manipulation tools (epstool, ImageMagick, ...).
- LaTeX spelling checker (aspell, Excalibur).
- Version control (CVS).
- Apache XML-Commons resolver for locating style sheets on the fly. (see http://xml.apache.org/commons/)
Did we achieve our goals?

- Cross-platform (Win32/Cygwin, Mac OS X, should work fine on any Unix derivative).
- \LaTeX{} gives high-quality print output.
- Good (and improving) HTML output.
- Customisable & extensible.
- Sufficient geek factor :)

Dr. StrangeBook  
CIS Seminar 2004
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Beyond the current version

- Roll out for INFO 212 (S2 2004).
- Investigate moving to DocBook (investigations in progress):
  - Should be relatively easy to write an XSL style sheet to convert our markup to DocBook
  - Need a customisation layer for “our” stuff
  - Default PDF output too Word-like; also needs customisation (Apache FOP vs. PassiveTEX vs. ??)
- Find a good cross-platform vector drawing tool! PGF? Sodipodi? Skencil? Kivio? Others? (but not XFig!!)
- SVG for graphics?
- Lecture slides in XML?
Questions?