\LaTeX Profiles as Objects in the Category of Markup Languages

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1 Translation of \LaTeX

Question: What works well with translation software?
Answer: Profiled usage of \LaTeX.

- Carefully limited command vocabulary.
- Tuned translation software.

2 Today’s Suggestion

formalize profiled usage
3 The Notion of \texttt{\LaTeX} Profile

- A dialect of \LaTeX\ with a fixed command vocabulary where all macro expansions must be effective in that vocabulary.
- A language essentially equivalent to an SGML document type with a canonical XML shadow.

4 A Simple Example

of a document under a \texttt{\LaTeX} profile

\documentclass{article}
\surtitle{\LaTeX\ Profiles}
\title{\LaTeX\ profiles: An Example}
\begin{document}

Classical \LaTeX\ can be very hard to translate, but \LaTeX\ profiles are straightforward to translate.

It’s easier to learn to write in a \LaTeX\ profile than to learn to write \LaTeX.

\textbf{Gratuitous Mathematical Content:}
The numbers \$\pi\$, \$i = \sqrt{-1}\$, and \$e = \exp(1)\$ are related by the equation
\[ e^{i\pi} = -1 \ . \]
\end{document}
5 Generalized \LaTeX

A \TeX Catalogue Entry from 2001

not under a \LaTeX profile

\begin{entry}[
  id="gellmu"
  datestamp="2001/07/30"
  modifier="hammond@math.albany.edu"
]\end{entry}

\begin{about}
  \caption{LaTeX-like markup for writing XML documents}
  \author{\name{William F. Hammond}\email{hammond@math.albany.edu}}
  \license[type="gpl"];
  \version{\number{0.7.4}\released{2001/07/26}}
\end{about}

\begin{description}
\begin{abstract}
  \ldots
\end{abstract}
\end{description}

\distribution{\ctan{support/gellmu}}
\end{entry}

6 Notion of Category

- A category consists of:
  1. Objects
  2. Arrows between objects
- Rule: An arrow followed by a second is also an arrow
- Relevance: to suggest a way of thinking about markup
- (No plans for actually using category theory)
7 The Category of Markup Languages

- Markup languages are the objects
- Translations are the arrows

8 Classical \LaTeX{}: an object in the category

(to the extent that classical \LaTeX{} is a well-defined language)

- \LaTeX{} is a reasonable translation target (for author-level markup languages).
- \LaTeX{} is a poor domain for translation to languages other than printer languages.

9 Texinfo: an object in the category

- The language of the GNU Documentation System.
- A good domain for translation.
- Essentially equivalent to an author-level XML document type — an historical accident
- No provision for author-level math.
10 SGML & XML

- SGML is a subcategory of the category of all markup languages
- XML is a subcategory of SGML
- XML is SGML made suitable for the World Wide Web

11 Good domains for translation

- Author-level SGML and XML document types are, by design, good domains for translation, i.e., arrows can flow from these document types.
- Arrows can be “chained”; these pipelines work well.

12 The \LaTeX Project

- Sponsor one or more reference profiles
- Sponsor translations from reference profiles to
  1. DVI and PDF
  2. HTML (including math)

13 Publishing

- Encourage maintainers of XML document types to reach HTML and PDF by translating first to reference \LaTeX profiles
- Encourage authors to submit articles to journals as \LaTeX instances under reference profiles.
14 The GELLMU Project

- Demonstrates that these ideas are not vaporous
- The GELLMU didactic document type may be viewed as a \texttt{LATEX} profile that can serve as a base for constructing reference profiles

15 These Slides

- HTML with Math
- Written in the GELLMU didactic document type albeit with slides in mind
- Generated from the XML document type with a special translator for making HTML slides
- Gratuitous Math:

\[
\int_0^\infty t^x e^{-t} \frac{dt}{t} = \frac{1}{x} \prod_{k=1}^{\infty} \frac{(1 + \frac{1}{k})^x}{(1 + \frac{x}{k})}
\]

16 Acknowledgement

The XHTML + MathML version of these slides uses W3C’s \textit{Slidy} by Dave Raggett, a JavaScript/CSS package for sizing and flow control of an HTML or XHTML slide show.

(The slides were generated in a non-standard fashion from GELLMU source.)