From LaTeX to MathML and beyond

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LaTeX is a high-level authoring language offering a special attention to mathematics. MathML is a low-level markup language representation for mathematics, suitable in particular for machine processing. Nemeth code, the standard used in North America for representing mathematics in braille, is a complex linear notation based on 63 symbols.

In recent years, I have been involved with the development of the TeX4ht tool for translating LaTeX to hypertext, and of a tool for translating hypertext to braille. The presentation will discuss the use of LaTeX for authoring content for the Web, with emphasis on MathML production. Lessons learned from translating LaTeX to braille through MathML will also be considered.

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Programming dynamic LaTeX documents

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This talk will present an overview of a co-operative programming model for generating dynamic LaTeX documents. The basic aim, at least in the area of computational science where the model was conceived, is to allow researchers to substantiate scientific articles with inline computer simulations whose code is open to hard scrutiny.

The current implementation (see http://www.amrita-ebook.org/drink-me) leverages off pdfLaTeX in a sufficiently general manner to be of interest beyond its specialist origins. And the talk will describe how TeX is utilized to bring out its typesetting strengths, while hiding its programming weaknesses. Thus the material might serve to add a fresh perspective on the developments needed to keep TeX relevant in the 21st century.

eXaMpLe

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The eXaMpLe project started as an experiment to bring XML into ConTeXt. When this was accomplished, a logical next step was to provide means to comfortably embed ConTeXt in workflows that deal with this kind of coding. This effort resulted in the eXaMpLe framework. This framework offers ConTeXt users the following benefits:

- remote access to a ConTeXt server by means of a client–server applications; one can either send requests by HTTP or drop request in hot folders
- technology to hide the nasty parts of TeX and related applications behind a user–interface, which itself is generated by ConTeXt
- an experimental editing environment for XML documents, either combined with, or not combined with TeX, driven by roles (authors, editors, reviewers)

The eXaMpLe framework is used by PRAGMA ADE, as well as its customers, for instance for the following:

- interfacing to TeX, Ghostscript and other applications in the typesetting workflow
- form based editing of letters and other small documents
- typesetting on demand, based on user requirements, from XML databases
- building and maintaining resource libraries (e.g. graphics)
- generating exams and drill-and-practice documents, based on user input

In this talk I will demonstrate the tools that are part of the eXaMpLe framework. I will also discuss the (XML based) scripting environment that drives the processes.

Web services for CTAN

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The material held in the Comprehensive TEX Archive Network sites is a great resource, but finding solutions to problems can be hard, especially for beginners or infrequent TEX users. The emerging standards of web information services promise to help. For instance, users looking for a package with some feature can now go to CTAN and search Graham Williams's *Catalogue* for keywords. However, currently this is done by hand: you fire up a browser and click around to enter the information. This could happen behind the scenes if CTAN furnished the results in some standard format. Web information services provide that format.

This talk will look at the work done so far, at plans for the future, and will also solicit ideas for other services.

(We expect to publish the full paper in the next regular issue of *TUGboat*. *Ed.*)

ERCOTEX: Yet another database publishing application of LATEX

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In the talk, a *database publishing system* for paper-based product presentations using pdfLATEX is presented which was developed to provide

1. top-quality typography;
2. completely automated document generation;
3. high flexibility for design and specification of documents from product 'specsheets' to complete catalogues;
4. multi-language support;
5. efficient production of very high volumes (number of documents, number of pages).

While some of the features (typographic excellence, multi-language support, support for high volumes) are provided by pdfLATEX 'out of the box' and at most require appropriate tweaking of TEX's parameters, to provide the optimal combination of completely automated document generation and high flexibility for document design and specification, a dedicated system consisting of several macro packages and document classes was created. The heart of the system consists of a macro package for managing a layout grid which is placed behind every page. Several pages can be constructed in parallel by placing objects (graphics, text, tables) in the grid. Grid cells are reserved according to measured dimensions of the placed objects.

It is possible to inspect the grid of a given page for free cells and continue construction accordingly. Text can flow between pages, either on a path which is calculated automatically, or through a predefined sequence of grid cells. Objects can be grouped and the group placed as a composite object (including the possibility for multi-column placement and page breaks). Dimensions of objects and groups can be measured, providing case distinctions for switching between design variants.

The automated production of a document requires a *data record* (TEX file in key-value syntax) and a *document description* (say, for a product specsheet) formulated in a special *document design language*, where data contents are placed in the grid.

(We expect to publish the full paper in the next regular issue of *TUGboat*. *Ed.*)