

Document Engineering with T_EX and METAPOST

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The Software

1.1 TEX

TEX is a program by Donald Knuth that allows the computer to do high-quality typesetting of documents.

- text-based interface
- conceptual model of document presentation: boxes, glue, penalties
- stable, free, intimidating

1.2 pdfT_EX

- a re-implementation of T_EX: pdf instead of dvi output
- pdf is the *Portable Document Format*, a file format designed by Adobe Systems, Inc.

1.3 METAPOST

- a programming language for generating graphics
 - a declarative, math-smart programming language
 - vector graphics
- by John Hobby, Knuth's star student
- based on METAFONT
- works very well with $\text{T}_{\text{E}}\text{X}$ thanks to Hans Hagen

1.4 ConT_EXt

- macropackage (like L_AT_EX is)
- high-level document features, e.g. indices, quire collation
- up-to-date features, e.g. hyperlinks, colors, graphics
- no feature conflict, e.g. L_AT_EX's multicol package breaks the TOC
- slower

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Applications

2.1 pdftex from perl

- safely make a unique temp dir
- make a file with TeX code in the temp dir
- run tex in subshell in temp dir on TeX source file
- slurp resulting pdf file into memory and serve
- clean up

- complex documents may benefit from using a template file in the second step.
- running the subshell from perl:

```
my $error =  
    system ("cd /tmp/foo-003 && pdftex foo.tex < /dev/null");
```

2.2 pdf $\text{T}_{\text{E}}\text{X}$ and METAPOST

- same steps as in the “[pdftex from perl](#)” example
- also put file with METAPOST code into temp dir
- also run mpost in subshell in temp dir on METAPOST source file before running $\text{T}_{\text{E}}\text{X}$
- $\text{T}_{\text{E}}\text{X}$ source will include a command that uses the METAPOST figure, e.g. ...

```
\convertMPtoPDF {foo.1}
```

- again, templates can help keep things manageable by keeping perl code simple: e.g., bulk of METAPOST code stays in template file instead of the perl source.
- Be meticulous with error checking to avoid hopeless sinking feeling if something goes wrong.

2.3 optimizing

using pdf \TeX and two METAPOST figures for efficiency

Two MP figures: one for unchanging stuff (*static* content); and one for the stuff that will change with each run (*dynamic* content).

same steps as in the “**pdf \TeX and METAPOST**” example, except ...

- put file with METAPOST code for dynamic content into temp dir
- create symlink to the preprocessed METAPOST figure for the static content
- run mpost in subshell in temp dir on the METAPOST source file for dynamic content
- \TeX source will include a command that uses both METAPOST figures, superimposing the dynamic one over the static one.

This is done with \TeX boxes of zero height and depth. For us, Ed’s “supersmash” macro handles it.

Applications

optimizing

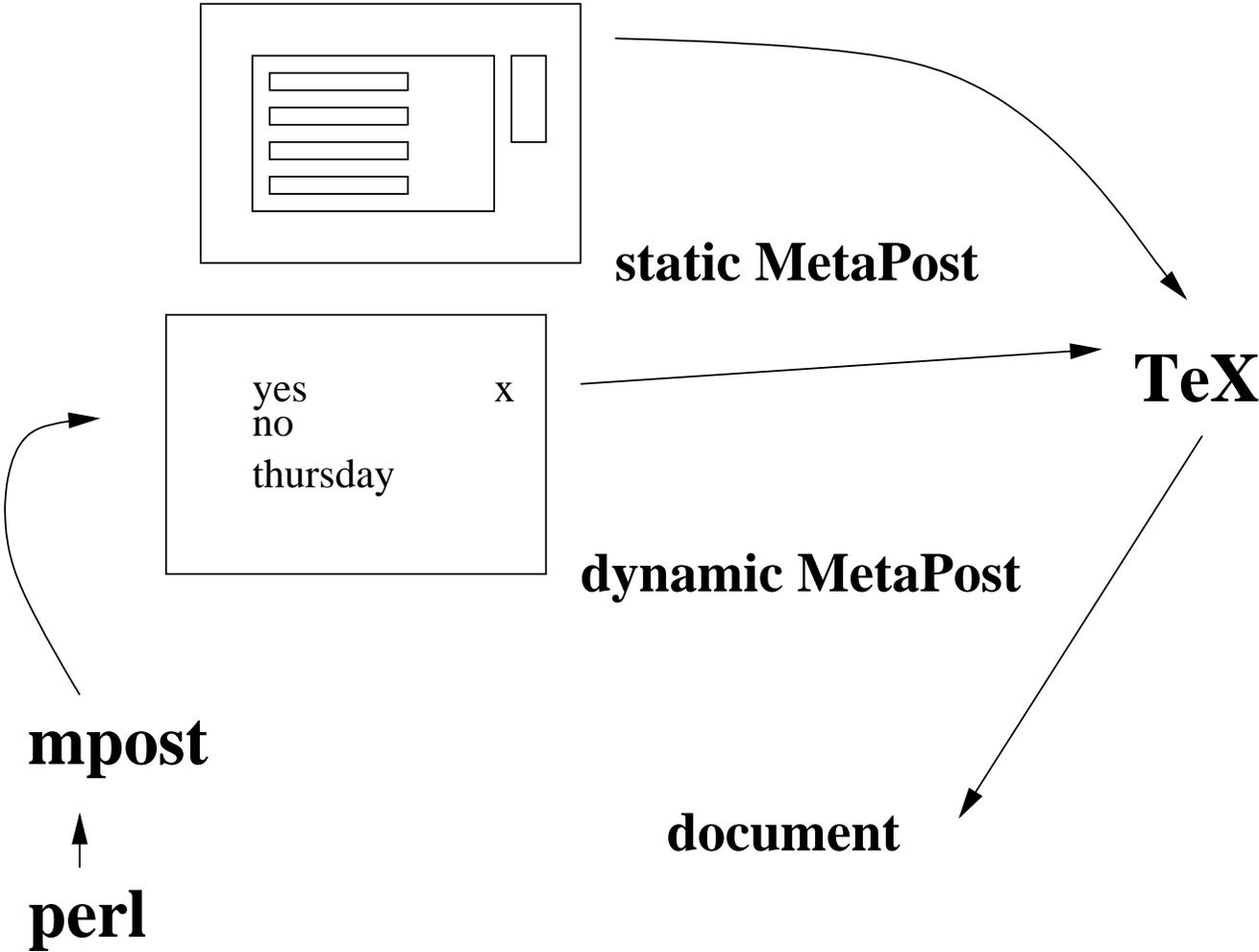


Figure 1 Using Two MetaPost figures

Advantages of using two MP figures:

- static content, like the background of a form, needn't be generated from source at every runtime.
- dynamic content changes with each run and so the MP figure is generated at runtime.

Resources

3.1 Online

- TUG, The T_EX User Group
<http://www.tug.org/>
 - CTAN: the Comprehensive T_EX Archive Network
Good for finding software.
 - pdfT_EX mailing list archive
<http://www.tug.org/cgi-bin/lwgate/pdftex/>
 - METAPOST links
<http://www.tug.org/metapost.html>
- Pragma-ADE, makers of ConT_EXt
<http://www.pragma-ade.nl/>

- `comp.text.tex`

Usenet group where T_EX questions are answered (sometimes).

- teT_EX Mailing list

Thomas Esser's excellent T_EX distribution has its own mailing list:

`<Majordomo@majordomo.informatik.uni-hannover.de>`

... and it is archived on the web:

`http://www.mail-archive.com/`

3.2 Offline

- *The T_EXbook*, Donald Knuth.

Authoritative and quirkily fun book by the creator of T_EX introduces T_EX and the powerful *plain* macropackage.¹

¹ Plain is the nicest macropackage for creating non-standard documents that must process quickly.

[toc](#)