TYPST

A *USER'S* PERSPECTIVE

Dr Eberhard W Lisse
2023-07-14
el@lisse.NA

INTRODUCTION

BACKGROUND

- Obstetrician & Gynecologist
- Medical School
  - University Bonn 1981-1982
    - IBM Shop
    - PDP Unix
  - Technical University Aachen 1983-1987
    - DEC Shop (VMS)
    - CDC
- LaTeX 1985
- Private Practice 2004
- LyX 2005

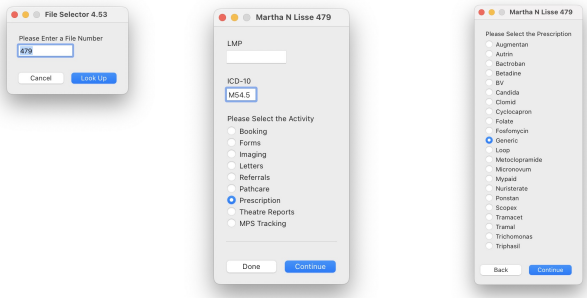
(COMMAND LINE) TOOLS

- Perl
- Bash
- (GNU) Make
- {My,Postgre}SQL{lite}
  - SQL-Ledger
- CSV2OFX
- QSV
  - MILLER
  - CSVQ
  - DATAMASH
- CSVIEW
- CSVLENS

PRACTICE WORKFLOW

- Mac (both Intel and Silicon)
- Scripting
  - Perl
  - Bash
  - Simple
    - Well Commented
- Simple Dialog/Menu
  - Pashua
- Templating
  - Template Toolkit
  - LyX

WORKFLOW DIALOG (PASHUA)



PRESCRIPTION TEMPLATING

DR. EBERHARD W. LISSE
State Examination (Aachen)
Obstetrician & Gynaecologist

PO Box 8421, Bachbrecht 10007
Swamed Centre, John Meinert Str, Windhoek
Practice Nr: 016-000-0141135

Telephone: 081 124 6733 (cell)
061 236403 (practice)
Date: [% TODAY %]

Name:	Ms [% FIRSTNAME %] [% SURNAME %]
Birthdate:	[% BIRTHDATE %]
Medical Aid:	[% MEDICALFUND %] [% MEDICALFUNDID %]
Address:	[% ADDRESSA %] [% ADDRESSB %] [% ADDRESSC %]
ICD-10:	[% ICDCODE %]
Diagnosis:	[% ICDTEXT %]

Rx

1. [% MED %] [% DOSE %] [% ROUTE %] * [% FREQ %] ([% TOTAL %])

Repeat * 3 prn

No Responsibility Taken for Generic Substitution

Dr Lisse

DR. EBERHARD W. LISSE
State Examination (Aachen)
Obstetrician & Gynaecologist

PO Box 8421, Bachbrecht 10007
Swamed Centre, John Meinert Str, Windhoek
Practice Nr: 016-000-0141135

Telephone: 081 124 6733 (cell)
061 236403 (practice)
Date: 2023-07-05

Name:	Ms Martha N Lisse
Birthdate:	19##-##-##
Medical Aid:	Fund ###-###-###
Address:	P.O. Box ##### Windhoek 10001
ICD-10:	M54.5
Diagnosis:	Backache

Rx

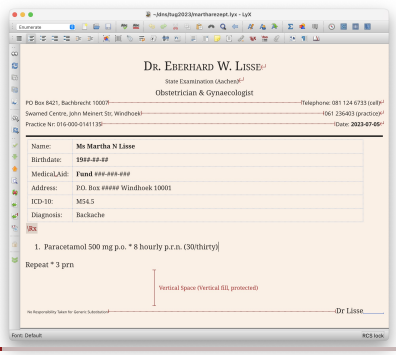
1. Paracetamol 500 mg p.o. * 8 hourly p.r.n. (30/thirty)

Repeat * 3 prn

No Responsibility Taken for Generic Substitution

Dr Lisse

PRESCRIPTION TEMPLATING



Templating/Scripting

VAT PAYABLE

TOTAL OUTPUT TAX DUE:	N$ 60000.14
LESS INPUT TAX CLAIMED	N$ 15000
AMOUNT DUE/REPAYABLE	N$ 45000.14
INTEREST	N$ 0
PENALTY	N$ 0
TOTAL PAYABLE	**N$ 45000.14**

Return Information

TIN:	########	Taxpayer Name:	Demo Internet Services (Pty) Ltd
Tax Type:	Value Added Tax	Return Type:	Value Added Tax Return
Period From:	2023-03-01	Period To:	2023-04-30
Return Period:	2023 04	Receive Date:	....
Due Date:	....		
EFT Ref No:	10# ######## 15 2023 04		

VAT DECLARED AND VAT CLAIMED

VAT DECLARED (Outputs)	Tax Categories (Namibian Dollars only)			TOTAL OUTPUT TAX DUE
Sales Figures (excluding VAT)	**Exempt**	**Zero-Rated**	**15%**	
Trading: Sales/Fees, etc	N$ 0	N$ 0	**N$ 400000.9**	**N$ 60000.14**
Capital goods sold	N$ 0	N$ 0	N$ 0	N$ 0
Output adjustments	N$ 0	N$ 0	N$ 0	N$ 0
TOTALS	N$ 0	N$ 0	N$ 400000.9	**N$ 60000.14**

VAT CLAIMED (Inputs)	Tax Categories (Namibian Dollars only			Total Input Tax Claimed
Purchasing Figures (excluding VAT)	**Exempt**	**Zero-Rated**	**15%**	
Local Purchases	N$ 0	N$ 0	**N$ 100000**	**N$ 15000**
Capital goods purchased locally	N$ 0	N$ 0	N$ 0	N$ 0
Imported purchases	N$ 0	N$ 0	N$ 0	N$ 0
Imported capital goods	N$ 0	N$ 0	N$ 0	N$ 0
Input adjustments	N$ 0	N$ 0	N$ 0	N$ 0
TOTALS	N$ 0	N$ 0	**N$ 100000**	**N$ 15000**

VAT Return Information Form *(v1.4)* Demo Internet Services (Pty) Ltd: **10# ######## 15 2023 04** 2023-05-04

Is TeX Ready for Prime Time?

LaTeX Prescription

```
\documentclass[a5paper,11pt,DIV=15]{scrartcl}
\usepackage[medium]{noto}
\usepackage{scrdate}
\usepackage{array}
\usepackage{setspace}
\pagestyle{empty}
\setlength{\parindent}{0mm}
\headsep0pt
\providecommand{\Rx}{\Large R\kern-0.1em\lower0.7ex\hbox{x}}
\setstretch{0.9}
\renewcommand{\arraystretch}{0.8}

\begin{document}

\begin{spacing}{1.2}
    \begin{center}
      \textsc{\LARGE{}Dr. Eberhard W. Lisse}\\
      {\footnotesize{}State Examination (Aachen)}\\
      Obstetrician \& Gynaecologist
      \end{center}
\end{spacing}
\vspace*{-1em}
\begin{center}
   \textsf{%
      \footnotesize{%
         PO Box 8421, Bachbrecht 10007\hfill{}
            Telephone: 081 124 6733 (cell)\\
         Swamed Centre, John Meinert Str, Windhoek\hfill{}
            061 236403 (practice)\\
         Practice Nr: 016-000-0141135\hfill{}
            Date: \textbf{2023-07-05}
      }
   }\\
   \footnotesize{\textbf{\rule{1\linewidth}{2pt}}}
\end{center}
```

```
\begin{spacing}{1.2}
   \small{
      \begin{tabular}{ll}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%                        Template Toolkit                    %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
      {Name:}        & \textbf{Ms Martha N Lisse}\\
      {Birthdate:}   & \textbf{19\#\#-\#\#-\#\#}\\
      {Medical~Aid:} & \textbf{Fund}{ \#\#\#-\#\#\#-\#\#\#}\\
      {Address:}     & {P.O. Box \#\#\#\#\# Windhoek 10001}\\
      {ICD-10:}      & {M54.5}\\
      {Diagnosis:}   & {Backache}\\
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
      \end{tabular}
   }
\end{spacing}
{\large{}\Rx}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%                              Manual                        %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\begin{enumerate}
   \item Paracetamol 500 mg p.o. {*} 8 hourly p.r.n.
         (30/thirty)
\end{enumerate}
Repeat {*} 3 prn
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\vfill
\textsf{
   {\tiny{}No Responsibility Taken for Generic Substitution}
   \hfill{}Dr Lisse\hspace{1cm}
}
\end{document}
%
% $Id: marthatex.tex,v 1.3 2023/07/05 13:39:57 el Exp $
%
```

After 45 Years...

- Short Answer
  - No
- Difficult
  - Complicated / Arcane
  - Powerful
- GUI?
  - Not really
  - LyX
- Dictation Impractical/Impossible
- Slow
  - PDFLaTeX
  - LuaLaTeX

NOW, THEREFORE...

Typst

- Masters Theses
  - Mädje / Haug
- Gap between
  - *Advanced tools like TeX/LaTeX*
  - *Simpler tools like Word or Google Docs*
- *Build a typesetting tool that is*
  - *highly capable and a pleasure to use*
- Speed
  - (near) WYSIWYG
    - Auto-Reload
- Rust

Typst

- Markup Language
  - Outputs PDF
  - Very fast
  - Simpler than LaTeX
    - Nontrivial
    - Less powerful than LaTeX
- On Line Tool
- Github
- Documentation

Command Line Tool

```
typst creates PDF files from .typ files

Usage: typst [OPTIONS] <COMMAND>

Commands:
  compile  Compiles the input file into a PDF file [aliases: c]
  watch    Watches the input file and recompiles on changes [aliases: w]
  fonts    List all discovered fonts in system and custom font paths
  help     Print this message or the help of the given subcommand(s)

Options:
      --root <DIR>       Configure the project root [env: TYPST_ROOT=]
      --font-path <DIR>  Add additional directories to search for fonts [env: TYPST_FONT_PATHS=]
  -v, --verbosity...     Sets the level of logging verbosity: -v = warning & error, -vv = info, -vvv = debug, -vvvv = trace
  -h, --help             Print help
  -V, --version          Print version
```

Fonts

```
typst fonts | grep 'Serif' | pr -2 -t
```

```
IBM Plex Serif                Noto Serif Balinese
IBM Plex Serif Text           Noto Serif Hmong Nyiakeng
Libertinus Serif              Noto Serif Myanmar
Libertinus Serif Display      Noto Serif Yezidi
Libertinus Serif Initials     PT Serif
Microsoft Sans Serif          PT Serif Caption
Noto Serif                    Roboto Serif
Noto Serif Ahom               Source Serif Pro
```

Hello World!

```
\documentclass{scrartcl}
\usepackage{noto}

\begin{document}

Hello World!

\end{document}
```

```
real  0m1.940s/0m0.871s
user  0m1.703s/0m0.811s
sys   0m0.190s/0m0.049s
```

```
#set text(font: "Noto Serif")

Hello World!
```

```
real  0m0.150s
user  0m0.092s
sys   0m0.053s
```

Sectioning

```
#set page(columns: 2)
= Section
#Lorem(30)
== Subsection
#Lorem(30)
=== Subsubsection
#Lorem(30)
```

```
#set heading(numbering: "1.1")
= Section
#Lorem(30)
== Subsection
#Lorem(30)
=== Subsubsection
#Lorem(30)
```

Sectioning

Section

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

Subsection

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

Subsubsection

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

1 Section

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

1.1 Subsection

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

1.1.1 Subsubsection

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri.

Markup Comparison

Element	LaTeX	Typst
Bullet list	itemize environment	- List
Citation	\cite{humphrey97}	@humphrey97
Emphasis	\emph{emphasis}	_emphasis_
Equation	x, align / equation environments	x, $ x = y $
Figure	figure environment	figure function
Label	\label{intro}	<intro>
Link	\url{https://typst.app}	https://typst.app/
Monospace / code	\texttt{print(1)}	`print(1)`
Numbered list	enumerate environment	+ List
Reference	\ref{intro}	@intro
Strong emphasis	\textbf{strong}	*strong*
Table	table environment	table function
Term list	description environment	/ Term: List

Typst Source

```
#let results = csv("latextypst.csv")
#align(center,
  table(
    columns: 3,
    fill: (_, row) =>
      if row == 0 { rgb( 255, 231, 230 ) }
      else if calc.odd(row) { rgb( 228,234,250 ) },
    align: (col, row) =>
      if row == 0 { center } else { left },
    ..results.flatten(),
  ),
)
```

Typst Table

Element	LaTeX	Typst
Bullet list	itemize environment	- List
Citation	\cite{humphrey97}	@humphrey97
Emphasis	\emph{emphasis}	_emphasis_
Equation	x, align / equation environments	x, $ x = y $
Figure	figure environment	figure function
Label	\label{intro}	<intro>
Link	\url{https://typst.app}	https://typst.app/
Monospace / code	\texttt{print(1)}	`print(1)`
Numbered list	enumerate environment	+ List
Reference	\ref{intro}	@intro
Strong emphasis	\textbf{strong}	*strong*
Table	table environment	table function
Term list	description environment	/ Term: List

On-Board Resources

LaTeX Package	Typst Alternative
graphicx, **svg**	**image** function
tabularx	**table**, **grid** functions
fontenc, **inputenc**, **unicode-math**	Just start writing!
babel, **polyglossia**	**text** function: **#set text(lang: "zh")**
amsmath	Math mode
amsfonts, **amssymb**	**sym** module and syntax
geometry, **fancyhdr**	**page** function
xcolor	**text** function: **#set text(fill: rgb("#BF101D"))**
hyperref	**link** function
bib{la}tex, **natbib**	**cite**, **bibliography** functions
lstlisting, **minted**	**raw** function and syntax
parskip	**block** and **par** functions
csquotes	Set the **text lang**uage and type " or '
caption	**figure** function
enumitem	**list**, **enum**, **terms** functions

On-Board Resources

Code Mode			
Name	Example	Name	Example
Variable access	x	Any literal	**1pt**, **"hey"**
Code block	{ **let** x = 1; x + 2 }	Content block	**[*Hello*]**
Parenthesized expression	(1 + 2)	**Array**	(1, 2, 3)
Dictionary	(a: "hi", b: 2)	Unary operator	-x
Binary operator	x + y	Assignment	x = 1
Field access	x.y	Method call	x.**flatten**()
Function call	**min**(x, y)	**Unnamed function**	(x, y) => x + y
Let binding	**let** x = 1	Named function	**let** f(x) = 2 * x
Set rule	**set** text(14pt)	Set-if rule	**set** text(..) **if** ..
Show-set rule	**show** par: **set** block(..)	Show rule with function	**show** raw: it => {..}
Show-everything rule	**show**: columns.with(2)	**Conditional**	**if** x == 1 {..} **else** {..}
For loop	**for** x **in** (1, 2, 3) {..}	While loop	**while** x < 10 {..}
Loop control flow	**break**, **continue**	Return from function	**return** x
Include module	**include** "bar.typ"	Import module	**import** "bar.typ"
Import items from module	**import** "bar.typ": **a**, **b**, **c**	**Comment**	/* block */, // line

Additional & On-Board Resources

```
#set text(11pt, font: "Noto Serif")
#import "@preview/tablex:0.0.4": *
#align(center,
   tablex(
      columns: 4,
      header-rows: 2,
      fill: (col, row) ⇒
         if row in (0,1) { rgb( 255, 231, 230 ) }
         else if calc.odd(row) { rgb( 228,234,250 ) },
      align: (_, row) ⇒
          if row in (0,1,4) { center } else { left },
      colspanx(4)[#text(size: 1.125em)[*Code Mode*]], (), (), (),
      [Name],                    [Example],                                  // Up to here: manual
      [Name],                    [Example],                        // From here: Pandoc'ed from CSV
      [#text(fill: rgb("#BF101D"))[*Variable access*]], [x],
      [Any literal],             [*1pt*, *"hey"*],
      [Code block],              [{ *let* x = 1; x + 2 }],
      [Content block],           [\[*\*Hello\**\]],
      /*
                                      Shortened to fit on slide
      */
      [#text(fill: rgb("#BF101D"))[Import items from module], [*import* "bar.typ": *a*, *b*, *c*],
      [#text(fill: rgb("#BF101D"))[Comment]], [*\/\** block *\*\/*, *\/\/* line],
   ),
)
```

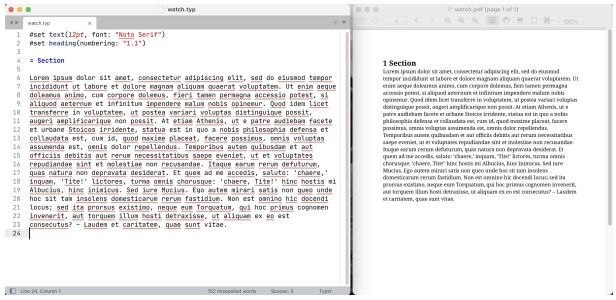
Additional Resources

- Package System
- typst-tablex (*almost* drop-in table replacement)
  - Header Rows
    - No footer rows (yet)
  - Multi-Columns/Rows
  - Format by *Content*
- typst-slides (not tried yet)
- gloss-awe (not tried yet)

Additional Resources

- Sublime Text (Mac/Linux/Windows)
  - Typst syntax highlighting
  - *Build* system
- *Watching* PDF Viewers
  - Mac
    - Skim
  - Linux
    - Evince, Okular
  - Windows
    - Sumatra PDF

watch.{typ,pdf}



Opinionated Summary

Nice To/Should/Must Haves

1. Floats
2. Index
3. Interaction with Environment
   3.1 Variables
   3.2 *shell-escape*?
4. Label / Reference
   4.1 Unnumbered Items
   4.2 *... on page #*

Nice To/Should/Must Haves/See

5. *Enumerate-Resume*
6. *Un-Scoped* #include
7. Citation Style Language (CSL)
8. See the Roadmap
9. See the (community) Wiki
10. Barrier Free PDF

Brilliant Effort!

- Very, Very Promising
  - Very Fast
  - Early Beta
    - 0.6.0
- Small(er) Projects
- Complex Projects?
  - *Beta*
  - Circumvent Missing Features
- Could be a *Gateway Drug* to LaTeX
  - Pandoc
- Further Links

Questions?

Colophon

- Homebrew
- MacTeX
  - **basictex** v2023.0314
  - `tlmgr (update -all)`
- LyX v2.3.7
  - LuaLaTeX v1.17.0
  - `Beamer` vv3.70
    - Metropolis Theme v1.2
- typst v0.6.0
- Template Toolkit v3.101
  - `CPAN`
- Pandoc v3.1.4
- Listings:
  - `typst` **`#raw`**
    - `pdfcpu` v0.4.1 dev
  - **`\includegraphics`**
- (GNU) Make v4.4.1

Version Numbers as of 2023-07-05