The mucproc class*

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1 Introduction

The mucproc class provides a document class which allows to use the LATEX document preparation system for contributions to the German "Mensch und Compuer 2017" conference. It corresponds to the Word-template offered via the conference's homepage http://muc2017.mensch-und-computer.de/for the year 2017. By offering this document class and an additional usage demonstration file (mucproc_demo.tex) we want to offer an easy to use possibility to prepare conference contributions in LATEX.

The goal of this document class is to create PDF-files which look like those created with the Word-template. Most of the contributions are still expected to be typeset in Word, that's why the mucproc class uses the historically grown formatting guidelines which have been created for Word-Users. Therefore the settings of this document class might not always be the typographically best.

2 Usage

A complete example of use can be found on the github repository for this project: https://github.com/Blubu/mucproc/

mucproc already configures all features needed for the usually required elements of a contribution to the MUC-conference. It loads a bunch of packages to simplify this process. Though the Syntax of the document using this class doesn't differ from classic LATEX documents.

2.1 Class options

\documentclass

Start your document by loading the mucproc class with an option for the document's main language. The class will expect either ngerman or english as main language. Otherwise an error message will be thrown.

^{*}This document corresponds to mucproc v1.0 MUC-conference, dated 2017/02/22.

For the language settings this class uses the babel package and loads csquotes for context sensitive quotations. The language option will also be used to configure the bibliography.

The other class option which can be used by authors is anonymous=truth value. It activates the anonymous-mode which shall be used for the submission to the review process before a contribution may be accepted. This option disables the author-field for the title and the additional author information as will be described later.

The third type of class option is not meant to be used by the authors themselves. It rather provides a possibility to force a document to be compiled in the final mode and enables some additional features of the document class. The option forcefinal=truth value will be used for a recompilation process for the preparation of the final version for the publication process of the proceedings. It can be passed to the class via command line interface and will disable a manually set anonymous-mode.

2.2 Title creation

\title

The \title command behaves identically to most popular document classes. There may be line breaks created with \\ or \newline inside the argument. Other formatting macros shall not be used, since this argument is also used for the metadata of the final PDF-file.

\author \and \thanks

The author macro can also be used similar to standard LATEX documents. If the document has more than one author, the names shall be separated with \and. The \thanks command shall be used to add the corresponding institution. It can be used similar to the standard LATEX definition, though it also can process an optional argument. The optional argument takes a label to reference an institution of another author. This prevents multiple mention of institutions. This macro is used to reference the labels set with the \thanks command. The implementation of the institution reference is very different from the usual label/ref mechanism. That's why the reference is only defined after the label was set. If the argument of \thanksref isn't a known Label an error will occur.

\thanksref

\author{John Doe\thanks[inst:1]{Institution 1}\and Jane Doe\thanks{Institution 2}\and John Doe II\thanksref{inst:1}

In contrast to the standard classes, mucproc doesn't place the footnotes created by \thanks on the bottom of the page, they are positioned directly below the author field of the title.

Other possible entries for the title (e.g. \date) are ignored.

\maketitle

The title has to be created by calling the \maketitle command as usual.

2.3 Additional author information

For the final version the authors of contributions have the possibility to add additional information about all authors. For this the mucproc class provides the authoraddendum environment.

authoraddendum

This environment can take up to 2 arguments, one optional containing the path to a corresponding photograph and a mandatory one for the Authors name.

```
\begin{authoraddendum}[john_doe.png]{Doe, John}
Text describing the author.
\end{authoraddendum}
```

If the optional picture argument ist left empty the text will be typeset over the whole \textwidth, otherwise there will be a 3 cm column on the left side containing the photograph.

3 Implementation

This section contains the source code to the mucproc.cls. It will be tried to explain how the class breaks the tasks.

3.0.1 Compatibility mode

This document class intends to be compiled on as many different distributions as possible. Basically this class compiles on releases newer than 2014/05/01 without errors. Nevertheless some specific fallback tests require a the expl3 package version of 2015/09/07 or newer. A compatibility mode test is implemented first and deactivates all problematic features of the class.

```
1 \RequirePackage{expl3}
2 \ExplSyntaxOn
3 \bool_new:N \g_MUC@compatibility_mode
4 \@ifpackagelater{expl3}{2015/09/07}{
5 \bool_gset_false:N \g_MUC@compatibility_mode
6 }{
7 \msg_new:nnn {mucproc}{compatibility}{
      Your LaTeX-Distribution seems to be outdated.
      Enabling~ compatibility~ Mode.\\\
9
      Some features won't be available.
10
11
      \msg_warning:nn {mucproc}{compatibility}
13 \bool_gset_true:N \g_MUC@compatibility_mode
14 }
15
16 \RequirePackage{xparse}
```

The boolean $\g_MUC@compatibility_mode$ is set true, if the expl3 is older than required.

3.1 Class options

The key-value class options are implemented using the scrbase package defining a Family called MUC.

```
17 \RequirePackage{scrbase}
18 \DefineFamily{MUC}
19 \DefineFamilyMember{MUC}
20 \bool_new:N \g_MUC@pdfa_bool
```

The Options anonymous and forcefinal are implemented using the basic scrbase mechanism for boolean options:

```
21 \FamilyBoolKey{MUC}{anonymous} 
22 \FamilyBoolKey{MUC}{forcefinal}{MUC@final} 
23 \FamilyBoolKey{MUC}{headline}{MUC@headline} 
24 \FamilyBoolKey{MUC}{copyrightinfo}{MUC@copyrightinfo} 
25 \FamilyBoolKey{MUC}{pagestyle}{MUC@pagestyle}
```

Set up the default boolean values before processing options.

```
26 \MUC@headlinetrue
27 \MUC@copyrightinfotrue
28 \MUC@pagestyletrue
29
30 \FamilyProcessOptions{MUC}
```

The pagestyle settings can be disabled if headline and copyrightinfo are set false.

```
31 \ifMUC@headline
32 \else
33 \ifMUC@copyrightinfo
34 \else
35 \MUC@pagestylefalse
36 \fi
37 \fi
```

If the forcefinal option is set, all global options containing the substring "draft" or both of the substrings"final" and "false" are removed to avoid any global draft mode.

```
38 \ifMUC@final
      \bool_if:NTF \g_MUC@compatibility_mode {
39
          \msg_new:nnn {mucproc} {compatibility-final-error} {
40
          forcefinal is not possible in compatibility mode. \\\
41
          Update your TeX distribution and retry!}
42
43
          \msg_error:nn {mucproc} {compatibility-final-error}
44
45
      }{
      \sys_if_engine_luatex:F {
46
          \msg_new:nnn {mucproc} {luatex-required} {
47
```

```
forcefinal~ requires~ LuaLaTeX~ for~ correct~ PDF/A~ output.\\\
48
          Remove forcefinal option or change the compiler.
49
50
          \msg_error:nn {mucproc} {luatex-required}
51
52
      \clist_new:N \l_MUC@globalopts_clist
53
54
      \msg_new:nnn {mucproc} {force-final} {
55
          forcefinal option is enabled. \\\
56
          Ignoring~ all~ global~ complementary~ options.}
57
      \msg_warning:nn {mucproc} {force-final}
58
      \msg_new:nnn {mucproc} {remove-draft}{
59
60
          forcefinal enabled: The global Option #1 is ignored,
          because it seems to activate draft mode!}
61
62
      \exp_args:Nx \clist_map_inline:nn {\@classoptionslist} {
63
       \tl_if_in:nnTF {#1} {draft}
64
65
              {\msg_warning:nnx {mucproc} {remove-draft} {#1}}
              {\clist_put_right:Nn \l_MUC@globalopts_clist {#1}}
66
          \tl_if_in:nnTF {#1} {final}
67
              {\tl_if_in:nnTF {#1} {false}
68
                  {\msg_warning:nnx {mucproc} {remove-draft} {#1}}
69
70
                  {\clist_put_right:Nn \l_MUC@globalopts_clist {#1}}
71
              }
              {\clist_put_right:Nn \l_MUC@globalopts_clist {#1}}
72
      }
73
74
75
      \edef\@classoptionslist{\clist_use:Nn \l_MUC@globalopts_clist {,}}
Additionally enable PDF/A-mode and metadata generation and disable
anonymization.
      \bool_gset_true:N \g_MUC@pdfa_bool
77
      \MUC@anonymousfalse
78
79
      }
80 \fi
```

3.2 Basic Setup

The next step is loading scrartcl as base class. According to the formatting rules we pass some options and use the mucfontsize10pt.clo file for setting up the font sizes.

```
81 \newcommand*{\@fontsizefilebase}{mucfontsize}
82 \PassOptionsToClass{abstract=true,parskip=full,fontsize=10pt,
83    twoside=semi){scrartcl}
84 \LoadClass{scrartcl}
85 \setparsizes{0pt}{7pt plus 7 pt}{1em plus 1 fill}
86 \raggedbottom
```

Now the other required packages can be loaded.

```
87 \RequirePackage{graphicx}
88 \RequirePackage{babel}
89 \PassOptionsToPackage{babel}{csquotes}
90 \bbl@frenchspacing
91 \RequirePackage{csquotes}
92
93 \RequirePackage{geometry}% setup margins
94 \geometry{paper=a4paper,top=4.8cm, bottom=5.7cm,left=3.8cm,right=4cm,
95 head=12.045pt,headsep=\dimexpr1cm-12.045pt\relax}
```

3.3 Bibliography setup

The bibliography will be created using biblatex with biber as backend.

```
96 \PassOptionsToPackage{backend=biber}{biblatex}
97 \PassOptionsToPackage{citestyle=authoryear-comp}{biblatex}
98 \PassOptionsToPackage{bibstyle=apa}{biblatex}
99 \RequirePackage{biblatex}
```

The APA-style requires a Language mapping. It is set for both supported main languages.

```
100 \DeclareLanguageMapping{american}{american-apa}
101 \DeclareLanguageMapping{ngerman}{ngerman-apa}
```

Set up additional Settings to get an equal output, like the Word-version.

```
102 \renewcaptionname{ngerman}{\refname}{Literaturverzeichnis} 103
```

104 \renewcommand*{\nameyeardelim}{\addcomma\space}

3.4 Font Choice

The formatting guidelines request Times New Roman as font. Since on most operating systems it is installed as a system font. We check if it is present and the currently used compiler supports the fontspec package.

```
105 \bool_new:N \g_MUC@fontspec_bool
```

These tests basically use the expl3 methods, but also a fallback for older distributions is implemented to support older distributions. First we implement the compatibility-version.

```
106 \bool_if:NTF \g_MUC@compatibility_mode {
```

To test if PDFT_EX is used, we check if \pdfmatch is defined.

```
107 \expandafter\ifx\csname pdfmatch\endcsname\relax
108 \else
109 \PassOptionsToPackage{utf8}{inputenc}
110 \RequirePackage{inputenc}
111 \fi
112 \bool_gset_false:N \g_MUC@fontspec_bool
```

Next step is the mechanism to check if the used compiler supports fontspec.

```
114 \sys_if_engine_luatex:TF {
            \bool_gset_true:N \g_MUC@fontspec_bool
115
116
       \sys_if_engine_xetex:TF{
117
                \verb|\bool_gset_true:N \ \g_MUC@fontspec_bool|
118
119
120
       \sys_if_engine_pdftex:T {
                \bool_gset_false:N \g_MUC@fontspec_bool
121
       \PassOptionsToPackage{utf8}{inputenc}
122
123
       \RequirePackage{inputenc}
124
            }
            }
125
       }
126
127 }
```

The font fallback is saved in a macro. This prevents the code to be written twice. It is executed when either FONTSPEC is not supported or Times New Roman isn't installed.

3.5 PDF/A-mode and metadata creation

The PDF archiving mode is created using the pdfx package. For the correct creation the PDF/A format and the .xmpdata file for metadata specific system settings may be required. Therefore this mode is only active if the forcefinal mode is enabled.

```
142 \if_bool:N \g_MUC@pdfa_bool

143 \PassOptionsToPackage{a-1b}{pdfx}

144 \RequirePackage{pdfx}

145 \hypersetup{hidelinks}

146 \iow_new:N \MUC@xmpdata_stream

147 \iow_open:Nn \MUC@xmpdata_stream {\jobname.xmpdata}

148 \tl_new:N \g_MUC@xmp_title
```

```
149
       \tl_new:N \g_MUC@xmp_author
150
       \newcommand*{\MUC@passTitleData}{
151
       \begingroup
152
       \def\newline{}
153
154
       \left( \frac{1}{2} \right)
       \xdef\MUC@author{\@author}
155
       \xdef\MUC@title{\@title}
156
       \cs_set:Npn \and {\exp_not:n {\exp_not:N \sep}}
157
       \tl_gset:Nx \g_MUC@xmp_title {\@title}
158
       \tl_gset:Nx \g_MUC@xmp_author {\@author}
159
       \endgroup
161
       \iow_now:Nx \MUC@xmpdata_stream
162
        \exp_not:N \Title{\tl_use:N \g_MUC@xmp_title}
163
164
        \exp_not:N \Author{\tl_use:N \g_MUC@xmp_author}
166
         \exp_not:N \Org{Mensch~ und~ Computer~ 2017}
167
168
        }
If no PDF/A shall be created, the \maketitle data will only be passed to
the headline.
170 \else:
       \msg_new:nnn {mucproc} {no-pdfa}{The mucproc class won't create PDF/A-mode.}
171
172
       \msg_info:nn {mucproc} {no-pdfa}
       \newcommand*{\MUC@passTitleData}{
173
174
            \begingroup
        \def\newline{}
175
         \left( \frac{1}{2} \right)
176
         \xdef\MUC@author{\@author}
        \xdef\MUC@title{\@title}
178
            \endgroup
179
180
       }
181 \fi:
```

4 Title creation

The title creation process also invokes the mechanism to pass the title data to headline and metadata. It can be initialized calling \maketitle.

4.1 Institution footnotes

The MUC formatting guidelines request the institutions typeset similar to footnotes, though they shouldn't be placed at the bottom of the page. The standard footnote mechanism is quite complicated, though we use the LATEX3 clist datatype to create a special mechanism implementing these

"footnotes". The mechanism is called inside \maketitle but created outside of that macro definition to leave the code more readable.

All Arguments of the \thanks command will be saved in the comma list called \l_MUC@thanks_clist.

```
182 \clist_new:N \l_MUC@thanks_clist
```

The value of the footnote counter has to be expanded when the \thanks macro is called. Otherwise the footnotemarks might not match. To achieve this expansion order the \MUC@thanks:nn command takes the counter value as first argument and the institution name as second.

Inside the real \thanks macro the first argument will be expanded directly. Additionally \MUC@thanks sets its own first (optional) argument as a label for the property list \g_MUC@InstRef_prof. This allows the footnote counter value to be accessed through the label.

```
187 \bool_if:NTF \g_MUC@compatibility_mode
188 {\NewDocumentCommand{\MUC@thanks}{om}{
189
       \footnotemark%
       \exp_args:Nx \MUC@thanks:nn {\thefootnote}{#2}
190
191
192 }{
193 \NewDocumentCommand{\MUC@thanks}{om}{
194
       \footnotemark%
       \IfNoValueF{#1}{
195
           \prop_if_exist:NF \g_MUC@InstRef_prop {
196
                \prop_new:N \g_MUC@InstRef_prop}
197
           \prop_put:Nnx \g_MUC@InstRef_prop {#1} {\thefootnote}
198
       \exp_args:Nx \MUC@thanks:nn {\thefootnote}{#2}
200
201
202 }
```

The mechanism seems to work like the typical LATEX label/ref though no backref is supported. To inform the user about this an error will be thrown when a label is accessed which does not exist.

```
203 \bool_if:NTF \g_MUC@compatibility_mode {
204 \msg_new:nnn {mucproc} {thanksref-unavailable} {
205     Compatibilty~ mode~ enabled.\\\
206     The~ institution~ reference~ mechanism~ is~ not available.\\\\
207     Update~ Your~ TeX~ distribution~ to~ be~ able~
208          to~ use~ this~ feature.
209     }
210 \msg_warning:nn {mucproc} {thanksref-unavailable}
211     \newcommand\MUC@thanksref[1]{$\dagger$}
212 }{
```

```
213 \msg_new:nnn {mucproc} {thanks-label-missing} {
      No institute labeled '#1'.\\\
       Add a label using the optional argument
215
           of the \thanks command.
216
217
218
219 \NewDocumentCommand\MUC@thanksref{m}{
       \prop_if_in:NnTF \g_MUC@InstRef_prop {#1} {
220
       \def\@thefnmark{\prop_item:Nn \g_MUC@InstRef_prop {#1}}%
221
222
       \@makefnmark
       }
223
       {\msg_error:nn {mucproc} {thanks-label-missing}}
224
225 }
226 }
 After the title has been set, the institutional notes shall be typeset.
```

```
227 \newcommand*\typeset@MUC@thanks {
228 \clist_use:Nn \l_MUC@thanks_clist {\rule{0pt}{0pt}\\}}
```

4.2 Typesetting the title

As written before, \maketitle has to execute additional jobs. Since the title fields also can contain other macros or even line breaks, the expansion process has to be controlled carefully.

```
229 \renewcommand*{\maketitle}{
230 \begingroup
```

Before passing the data to the headlines or metadata using the earlier defined \MUC@passTitleData we need some redefinitions for the commands, which can be used inside the title fields.

```
231 \DeclareExpandableDocumentCommand{\thanks}{om}{}
232 \def\thanksref##1{}
233 \def\and{\unskip,~\ignorespaces}
234 \MUC@passTitleData
```

Not the actual title creation begins redefining the user macros to those prepared for that purpose.

```
235 \let\titlepage@restore\relax
236 \renewcommand*\thefootnote{\@arabic\c@footnote}
237 \let\thanks\MUC@thanks
238 \let\thanksref\MUC@thanksref
Now only the title fields have to be typeset.
239 \global\@topnum=\z@
240 \setparsizes{\z@}{\z@}{\z@}@plus 1fil}\par@updaterelative
241 \null
242 \vskip 41pt
```

243 {\usekomafont{title}{\Huge \@title \par}}%

\Large\@subtitle\par\fi}%

245

```
246
       \vskip 7pt
247 {%
248 \usekomafont{author}{%
249 \lineskip .5em%
250 \@author
251 \par
252 }%
253 }%
254 \par
255 \vskip 8pt
256 \bool_if:NTF \g_MUC@compatibility_mode
       {\thispagestyle{empty}}
257
258
       {\thispagestyle{MUC@titlepagestyle}}
259 \typeset@MUC@thanks
260 \par
261 \vspace{8pt}
262 \endgroup
263 \setcounter{footnote}{0}%
264 \global\let\and\relax
265 \global\let\thanksref\relax
266 }
```

4.3 Anonymization and additional author information

The anonymization is realized checking the setting using the corresponding if-expression. The \@author information to the language dependent meaning of \MUCanonymousauthor.

```
267 \newcaptionname{ngerman}{\MUCanonymousauthor}{Anonymisierte Fassung} \\ 268 \newcaptionname{english}{\MUCanonymousauthor}{anonymous version} \\ 269 \ifMUC@anonymous \\ 270 \def\@author{\MUCanonymousauthor} \\ 271 \def\author#1\relax
```

The authoraddendum environment shall create no output, if the anonymous mode is active.

```
272 \RequirePackage{comment}
273 \excludecomment{authoraddendum}
274 \else
```

authoraddendum

The Implementation works via the typical xparse mechanisms.

```
275
       \NewDocumentEnvironment{authoraddendum}{d<>om}{
276
           \par
           \IfNoValueTF{#2}{
277
           {\usekomafont{authoraddendum}#3}\par\medskip
278
279
           \begin{minipage}[t]{3cm}
280
           \vspace{0pt}
281
           \IfNoValueTF{#1}{
                \includegraphics[width=\linewidth]{#2}
283
```

```
}{
284
285
                \includegraphics[#1]{#2}
            }
286
            \end{minipage}\hspace{.5cm}%
287
            \begin{minipage}[t]{\dimexpr\linewidth-3.5cm\relax}
289
            \vspace{0pt}
            {\usekomafont{authoraddendum}#3}\par\medskip%
290
291
            \usekomafont{authoraddendum}
293
            \IfNoValueF{#2}{\end{minipage}}
294
295
            \par
296
297 \fi
```

4.4 Visible adjustment of sizes and spacing

To match the Word template we have to adjust a bunch of spacing settings as well as font sizes. The easiest way to achieve this is using the KOMA-Script mechanisms.

4.5 Structure Settings

Word indents the section headings independent from the width of the section number. To achieve this a macro called \MUC@sectionnumberbox is created and all section formats are redefined. In compatibility mode these settings will be ignored.

```
298 \reverse_if:N \if_bool:N \g_MUC@compatibility_mode
299 \newcommand*{\MUC@sectionnumberbox}[1]{\makebox[28bp][1]{#1\autodot}}
300 \renewcommand*{\sectionformat}{
       \MUC@sectionnumberbox{\thesection}}
302 \renewcommand*{\subsectionformat}{
       \MUC@sectionnumberbox{\thesubsection}}
304 \renewcommand*{\subsubsectionformat}{
       \MUC@sectionnumberbox{\thesubsubsection}}
The spacing around the headings also has to be adjusted:
306 \RedeclareSectionCommand[afterskip=1.5ex plus .2ex,%
       beforeskip=-3.6ex plus -1ex minus -.2ex]{section}
308 \RedeclareSectionCommand[afterskip=.5ex plus .2ex,%
       beforeskip=-1ex plus -1ex minus -.2ex]{subsection}
309
310 \RedeclareSectionCommand[afterskip=.5ex plus .2ex,%
       beforeskip=-1ex plus -1ex minus -.2ex]{subsubsection}
312 \RedeclareSectionCommand[afterskip=1em,%
       beforeskip=1ex plus 1ex minus .2ex]{paragraph}
314 \RedeclareSectionCommand[afterskip=1em,%
       beforeskip=1ex plus 1ex minus .2ex]{subparagraph}
316 \fi:
317 \ExplSyntaxOff
```

The font settings will be done together with all other font settings in the next subsection.

4.6 Font Settings

Adjusting the font settings to match the Word version:

```
318 \setkomafont{disposition}{}
319 \setkomafont{title}{}
320 \setkomafont{author}{\large}
321 \setkomafont{section}{\LARGE}
322 \setkomafont{subsection}{\Large}
323 \setkomafont{caption}{\footnotesize\itshape}
324 \setkomafont{captionlabel}{\usekomafont{caption}}
325 \newkomafont{abstractcontent}{\small}
326 \newkomafont{abstract}{\normalsize\bfseries}
327 \newkomafont{authoraddendum}{\small}
```

4.7 Abstract

The abstract environment is redefined to match the Word version.

```
328 \renewenvironment{abstract}{%
329    \setparsizes{0pt}{4pt}{0pt plus 1 fill}{%
330    \usekomafont{abstract}}%
331    \abstractname}\par%
332    \usekomafont{abstractcontent}}{}
```

4.8 Pagestyle

The demo document shows a headline containing author and document title. To achieve this that information was passed inside the \maketitle macro and saved in the \MUC@author and \MUC@title macros. There is also a possibility to set a copyright-information box similar to the Word template.

```
333 \ifMUC@pagestyle
334 \PassOptionsToPackage{headsepline}{scrlayer-scrpage}
335 \RequirePackage{scrlayer-scrpage}
336 \ifMUC@copyrightinfo
```

Nowadays it is possible to write the complete content for the scrlayers directly inside the definition. To support older distributions as well the content is wrapped into a box. The most absolute length values have been extracted from different measurements to match the Word version.

```
-2\fboxrule\relax][t]{%
342
343
                    \dimexpr\textwidth-2\fboxsep-2\fboxrule%
344
                    -1.6pt\relax{%
        Platzhalter für DOI und ggf. Copyright Text.
345
346
           (Bitte nicht entfernen).\par
        \vspace{7pt}
347
        Name, Vorname (2017): Titel.%
348
        Tagungsband Mensch und Computer 2017.
349
           Gesellschaft für Informatik.%
350
        DOI: xxxxxx}%
351
        }
352
        \end{lrbox}
353
354
       \DeclareNewLayer[align=tl,area={\dimexpr 1in
355
            + \hoffset + \oddsidemargin\relax}{%
           \dimexpr\paperheight-3.9cm\relax}{\textwidth}{2cm},
356
           contents={\usebox\MUC@copyrightbox}]{copyright}
357
358
       \DeclareNewPageStyleByLayers{MUC@titlepagestyle}{copyright}
359
       \DeclareNewPageStyleAlias{MUC@titlepagestyle}{empty}
360
361
       \fi
       \clearpairofpagestyles
362
       \ifMUC@headline
363
           \lohead{\MUC@title}
364
365
           \rehead{\csname MUC@author\endcsname}
366
       \fi
       \setkomafont{pagehead}{\normalfont}
367
       \setkomafont{pagefoot}{}
368
369 \fi
```