Preparing Proposals in LaTeX with `proposal.cls`*

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Abstract

The `proposal` class supports many of the generic elements of Grant Proposals. It is optimized towards collaborative projects, and should specialized to particular funding agencies.

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*Version ? (last revised ?)

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1 Introduction

Writing grant proposals is a collaborative effort that requires the integration of contributions from many individuals. The use of an ASCII-based format like LaTeX allows to coordinate the process via a source code control system like Git or Subversion, allowing the proposal writing team to concentrate on the contents rather than the mechanics of wrangling with text fragments and revisions. In fact the `proposal` package has evolved out of a series of collaborative proposal writing efforts, where large teams (up to 30 individuals from up to 20 sites) have written a 100-page proposal in three weeks (with over 2000 commits). Such collaborative writing sprints are impossible without a revision control system and a "semantic" document class that generates tables, charts, and deliverable lists from content markup and thus takes care of many of the routine tasks of keeping information consistent.

The `proposal` class supports many of the generic elements of Grant Proposals. The package documentation is still preliminary, fragmented and incomplete.

The `proposal` class is distributed under the terms of the LaTeX Project Public License from CTAN archives in directory `macros/latex/base/lppl.txt`. Either version 1.0 or, at your option, any later version.

The CTAN archive always contains the latest stable version, the development version can be found on GitHub at https://github.com/KWARC/LaTeX-proposal. For bug reports please use the issue tracker there. Please feel free to fork the repository and provide extensions and improvements.

The development version also contains example proposals and a very useful script that generates GitHub issues for all the workpackages, tasks, and deliverables. This is a great way of starting up a project and controlling its progress. The OpenDreamKit EU project (see http://opendreamkit.org) uses this for its (very public) project planning on the issue tracker at https://github.com/OpenDreamKit after (also publicly) developing the proposal on GitHub.

Finally, the GitHub reposistory contains example project proposals and specialized Makefiles that help start off the proposal development process. These are not part of the CTAN/TeXLive distributions.

2 The User Interface

In this section we will describe the functionality offered by the `proposal` class along the lines of the macros and environments the class provides.

2.1 Package Options

The `proposal` package takes the options `submit`, `noworkareas`, `RAM`, `deliverables`, `wpsubsection`, `keys`, `svninfo`, `gitinfo`, and `public`.

`submit` The `submit` option will disable various proposal management decorations which are enabled by default for submission.

`noworkareas` The `noworkareas` option specifies that we do not want to structure our work plan into work areas (see section 2.6).

`RAM` The `RAM` option specifies that we specify research assistant months in the effort tallies (see section 2.6).

`deliverables` The `deliverables` option specifies that we specify deliverables in the grant proposal (see section 2.9). As the deliverables management needs extra support, we only activate them via this option.

`wpsubsection` The `wpsubsection` option specifies that we want to see subsections headings for the WPs (and WAs, if we have them).

`report` The `report` option specifies that we want to use the `report.cls` class as a basis for `proposal` instead of the default `article.cls`.

`keys` The `keys` option specifies that we want to see the values of various keyval arguments in the

margin.

svninfo The `svninfo` option specifies specifies that we want to use the `svninfo` package for displaying version control metadata in the document (except when the `submit` option is also given). For this we need the `svninfo` metadata line of the form

```
\SVN $Id: proposal.tex 13610 2007-07-11 04:30:16Z kohlhase $
\svnKeyword $HeadURL: https://svn.kwarc.info/../proposal.tex $
```

at the beginning of each file (or in the preamble).

gitinfo Analogously, the `gitinfo` option uses the `gitinfo2` package for GIT metadata. Note that you will need to install the post-commit hooks in your working copy according to [Lon] for this to work.

public Finally, the `public` option allows to hide certain sensitive (e.g. financial) parts of the proposal.
private For this, the `proposal` class provides the `private` environment. If the option `public` is set, the parts of the document between `\begin{private}` and `\end{private}` do not produce output. This is useful for producing public versions of the proposal that hide confidential parts. Note that both `\begin{private}` and `\end{private}` *have to be on lines of their own may not have any leading whitespace* otherwise an error occurs and LaTeX gives error messages that are difficult to comprehend. An alternative way to distinguish private and public sections are to use the
\ifpublic `\ifpublic` conditional: `\ifpublic{3}\else{5}\fi` will result in "5" in the submitted draft and "3" in the public document.

2.2 Proposal Metadata

proposal The metadata of the proposal is specified in the `proposal` environment, which also generates the title page and the first section of the proposal as well as the last pages of the proposal with the signatures, enclosures, and references. The `proposal` environment should contain all the mandatory parts of the proposal text. The `proposal` environment uses the following keys to specify metadata.

- title `title` for the proposal title (used on the title page),
- instrument `instrument` for the instrument of funding that you would like to apply for,
- acronym, acrolong `acronym` for the proposal acronym, possibly accompanied by an `acrolong` that explains it. The acronym will also be used in the page headings.
- start, months `start` for the start date of the proposed fragment of the project, and `months` for the length of the proposal in months. Both have to be specified for the `proposal` class to work.
- since, fundsuntil If the proposal only concerns a part of a longer-running project, the `since` key allows to specify the date since when the overall project runs. Finally, the `fundsuntil` allows to specify a date until which the funds last.
- discipline `discipline` for the academic discipline and `areas` for the research areas in that discipline.
- PI `PI` to declare the principal investigator. For collaborative proposals we can use the `PI` key multiple times. The `proposal` package uses the `workaddress` package for representation of personal metadata, see [Koh16c] or the file `proposal.tex` for details.
- site Many collaborative proposals are shared between two institutions, which we can declare with the `site` key. As this changes the interface this should not be used for single-institution proposals. We will describe the setup for a single-site proposal below and point out the differences. The example `proposal.tex` is a two-site proposal.

\pn If the `acronym` and `acrolong` are given, then they automatically define the macros `\pn` and
\pnlong `\pnlong` which allow to use the project acronym (project nname) and its long version in the text. Note that these macros use `\xspace` internallly, so they do not have to be enclosed in curly braces.

There are two ways of organizing the distribution of personnel resources when developing a proposal. Either the coordinator takes a *top-down approach* where she assigns person months (PM) to the respective site, of she takes a *bottom-up approach*, where the sites "request" personnel resources by marking them up in the CVs of the researchers in the site descriptions. `proposal.cls`
topdownPM supports both of these. Support for the first is configured via the `topdownPM` key and for the other

botupPM via the botupPM key. They add respective lines for planning in the WA/WP figure (see 2.6).

2.3 Proposal Appearance

The proposal environment takes a second set of keyval arguments that allow to fine-tune the
EdN:1 appearance of the proposal document. [1]

compactht
EdN:2
- If the compactht key is given (it does not need a value), then the header tables[2] are made compact, i.e. the sites that do not have a contribution to the work package or work area do not get listed. This is useful for proposals with more than 8 partners.

emphbox The proposal package supplies the emphbox environment to create boxes of emphasized material we want to call attention to.

2.4 The proposal Environment and Title Page

EdN:3 [3]

2.5 Objectives

The work plan starts with a discussion of objectives, which may be referenced in the text later.
objective The proposal package provides the objective environment that allows to mark up individual objectives. It takes a keyval argument with the keys id for identification, title for the objective title, and short for a short title that can be used for referencing when the title is too long. The
\OBJref objectives can be referenced via \OJBref{⟨*id*⟩} by their label and via \OJBtref{⟨*id*⟩} by label
\OBJtref and (short if it was specified) title.

2.6 Work Areas and Work Packages

Grant proposals have another part that is often highly stylized; the work plan. This is usually structured into "work packages" — i.e. work items that address a cohesive aspect of the proposed work. These work packages are usually consecutively numbered, have a title, and an associated effort estimation. As work packages are the "atomic" planning units, they are usually heavily cross-referenced. A well-written proposal usually contains a table giving an overview over the work packages and their efforts and a Gantt chart showing the temporal distribution of the proposed work to allow the reviewers to get a clear picture of the feasibility of the research and development proposed. But this picture is also essential during the development of a proposal (which the proposal package aims to support), when the work packages (and their estimated efforts) usually change considerably. Therefore the proposal class standardizes markup for work packages and automatically computes the work package table (which can be inserted into the table via the
\wpfig \wpfig macro) and the Gantt Chart (see Section 2.12).

workplan To achieve the automation, work plan is marked up by the workplan environment, which sets up various internal counters and bookeeping macros. It contains texts and workpackage environments for the work packages.

workpackage The purpose of the workpackage environment is to mark up a fragment of text as a work package description and specify the metadata so that it can be used in the work package table and Gantt chart generation. The metadata is specified by the following keys:

id
- The id key is used to specify a label for cross-referencing the work package or work area, it must be document-unique.

title
short
- The title and short keys are used for the work package/group title. The short title is used in tables and should not be longer than 15 characters.

wphases
- The wphases key is used according to Section 2.8

requires
- The requires key can be used to mark, up dependencies between tasks. If requires=\taskin{⟨*rid*⟩}{⟨*wp*⟩}

[1] EdNote: move the RAM, wpsectionheadings,... options here.
[2] EdNote: describe them somewhere and reference here
[3] EdNote: add documentation

is given in a task with `id=`⟨*t*⟩, then task ⟨*rid*⟩ in work package ⟨*wp*⟩ must be completed for task ⟨*t*⟩ to become possible. This key will draw an arrow into the gantt chart from the end of task ⟨*rid*⟩ to ⟨*t*⟩. Note that dependencies should always point forward in time. Furthermore, note that the fact that dependencies always go from the end of the source to the beginning of the target work phase is intentional, if this does not meet your needs, then you should probably break a work phase into pieces that can be addressed separately.

`RM` `RAM`
- In single-site proposals, the `RM` (and `RAM` if the `RAM` option was given) keys are used to specify the estimated efforts to be expended on research and development in this work package. Both are specified in person months. `RM` is used for "researcher months" (wissenschaftlicher Mitarbeiter) and `RAM` for "research assistant months" (wissenschaftliche Hilfskraft).

`*RM` `*RAM`
- In multi-site proposals, the `proposal` package generates the keys ⟨*site*⟩`RM` (and ⟨*site*⟩`RAM`) where ⟨*site*⟩ is any site label declared via the `site` key in the top-level `proposal` environment. This can be used to specify the person months that the site spends on this work package (the value for work areas is automatically computed (remember to run LaTeX twice for this)).

`lead`
- In multi-site proposals the `lead` key specifies the work package or work area lead, the value of this feature should be the short name of the respective partner.

`swsites`
- For work packages with many prospers the `swsites` key can be given (no value needed) to turn the site names sideways to conserve (horizontal) space.

`workarea`
It is often useful to group the work packages in a proposal further (especially for larger, collaborative proposals). This can be done via the `workarea` environment, which groups work packages. This environment takes the same keys as the `workpackage` environment, except for the efforts, which can be computed automatically from the work packages it groups.

As the author of the `proposal` class likes more structured proposals, using work areas is the default, but the `proposal` class can also be used with the `noworkareas` option for less structured (smaller) proposals.

2.7 Tasks

`tasklist` `task`
In the work packages we can list tasks that need to be undertaken with the `tasklist` environment. The individual tasks are marked up with the `task` environment. This takes a keyval argument with the keys `id` for identification, `title` for a title, and the workphase keys `wphases`, `start`, `end`, and `force` (see Section 2.8). For planning involvement we can specify the overall person months via the `PM` key, the task lead via `lead`, and the partners involved via the `partners` key. Finally task dependencies can be specified via the `requires` key.

`\taskref` `\tasktref` `\localtaskref`
Tasks can be referenced by the `\taskref` macro that takes two arguments: the work package identifier and the task identifier. As for work packages and work areas, there is a long reference variant with work package title: `\tasktref`. Finally, `\localtaskref` references a task in the local work package by the identifier in its argument.

2.8 Work Phase Metadata

`wphases`
The `task` and `workpackage` allow the `wphases` key to specify the a list of work phases. The value of this key is comma-separated list of work phase specifications of the form ⟨*start*⟩`-`⟨*end*⟩ or ⟨*start*⟩`-`⟨*end*⟩`!`⟨*force*⟩, where ⟨*start*⟩ and ⟨*end*⟩ delimit the run time of the work phase and the optional `!`⟨*force*⟩ specifies the work force, i.e. the intensity of work as a number between 0 and 1. If no force is given, the default is 1. The main reason for specifying this metadata for tasks is to generate a Gantt chart (see Section 2.12).

2.9 Milestones and Deliverables

Many proposal formats foresee that project progress will be tracked in the form of *milestones* – points in the project, where a predefined state of affairs is reached – and *deliverables* – tangible project outcomes that have to be delivered. Correspondingly, milestones and deliverables have to be specified in the proposal and accounted for in the project reports. To facilitate this the

proposal class and its instances provide a simple infrastructure for dealing with milestones and deliverables.

milestones

Milestones are usually given in a special table[1], which we markup up with the milestones environment that takes care of initialization and numbering issues. This contains a list of milestone descriptions via the \milestone macro which is invoked as \milestone[⟨keys⟩]{⟨title⟩}{⟨desc⟩}, where ⟨keys⟩ supports the keys id for identification month for specifying the milestone date (in months of the project duration). Milestones are numbered with labels whose shape can be customized by redefining \milestone@label and referenced by the \mileref{⟨id⟩} and \miletref{⟨id⟩} for a reference with milestone title. \pdatacount{all}{miles} gives the number of milestones.

\milestone
\milestone@label
\mileref
\miletref

Deliverables are usually defined as part of the work package descriptions (see Section 2.6) and listed in an overview table in a separate of the proposal. As for the milestones, we use an environment wpdelivs that contains the deliverable descriptions. These are marked up via the environment which takes an optional keyval argument for the deliverable metadata a regular argument for the title and contains the description of the deliverable as the body. For the metadata we have the keys id for the deliverable identifier, due for the target date (a number that denotes the project month), nature and dissem for specifying the deliverable nature and dissemination status (usually as short strings prescribed by the proposal template), and miles for the milestone this deliverable is targeted for (specified by the milestone identifier). For repeating deliverables (e.g. project reports), both due and miles can contain comma-separated lists. Deliverables are numbered by labels whose shape can be customized by number, where the shape of the label can be specified by redefining \deliv@label and referenced by \delivref{⟨wp⟩}{⟨id⟩} where ⟨wp⟩ is the work package identifier and ⟨id⟩ that if the deliverable and \delivtref{⟨wp⟩}{⟨id⟩} for a reference with title. \localdelivref can be used to reference deliverables in the same work package. \pdatacount{⟨wp⟩}{delivs} gives the number of milestones of the work package ⟨wp⟩ \pdatacount{all}{delivs} that of all deliverables (aggregating over all work packages).

wpdelivs
wpdeliv
\deliv@label
\delivref
\delivtref
\localdelivref

Some proposal templates ask for an overview table of the deliverables which aggregates the deliverables of the respective work packages and areas ordered by due date. This can be generated with the \inputdelivs macro. This works index generation in LaTeX. The wpdeliv environment writes the deliverable data to a file ⟨main⟩.delivs, which can be processed externally (usually just sorting with sort in Unix is sufficient) into ⟨main⟩.deliverables, which is then input via the \inputdelivs macro.

\inputdelivs

In some proposals, also work areas can have deliverables, then the above hold analogously for wpdelivs and wadeliv environments.

wadelivs
wadeliv

Note that handling deliverables adds considerable overhead to proposal formatting and adds auxiliary files, so they are only activated if the deliverables option is given (see Section 2.1).

2.10 Project Data, Referencing, and Hyperlinking

The proposal package extends the hyperlinking provided by the hyperref package it includes to work packages, work areas, ... Whenever these are defined using the proposal infrastructure, the class saves the relevant information in the auxiliary file ⟨proposal⟩.aux. This information can be referenced via the \pdataref macro, which takes three arguments.

\pdataref

In a reference \pdataref{⟨type⟩}{⟨id⟩}{⟨aspect⟩} the first argument ⟨type⟩ specifies the type of the object (currently one of wp, wa, and partner) to be referenced, ⟨id⟩ specifies the identifier of the referenced object (it matches the identifier given in the id key of the object), and ⟨aspect⟩ specifies the aspect of the saved information that is referenced.

\pdatarefFB{⟨type⟩}{⟨id⟩}{⟨a1⟩}{⟨a2⟩} tries first \pdataref{⟨type⟩}{⟨id⟩}{⟨a1⟩} and if that is not given \pdataref{⟨type⟩}{⟨id⟩}{⟨a2⟩}.

\pdatarefFB

For a work package ⟨aspect⟩ can be number, (the work package number), label (the label **WP***n* where *n* is the work package number for referencing), title (the work package title), lead

[1] this is the default provided by the base proposal class, it can be specialized for proposal class instances by redefining the @milestones environment and correspondingly the milestone macro.

the work package leader, `short` (a short version of the WP title for tables). For work areas we have the same aspects with analogous meanings. In all cases, the referenced information carries a hyperlink to the referenced object.

`\pdataRef` `\pdataRefFB` The `\pdataRef` and `\pdataRefFB` macros are variant of `\pdataref` and `\pdataRef` that also carry a hyperlink (if the `hyperref` package is loaded).

`\pdatacount` The `\pdatacount` macro gives access to the numbers of certain aspects. For instance, the number of work packages in the proposal can be cited by `\pdatacount{all}{wp}`, similarly for work areas (if they are enabled), and finally, `\pdatacount{`⟨*wa*⟩`}{wp}` gives the number of work packages for a work area ⟨*wa*⟩. This is very useful for talking about work plans in a general way. Other objects that can be counted are deliverables (`\pdatacount{all}{deliverables}`) and milestones (`\pdatacount{all}{milestones}`).

Note that since the referencable information is written into the project data file ⟨*proposal*⟩`.pdata` file, it is available for forward references. However, it will only become available when the project data file is read, so the proposal has to be formatted twice for references to be correct.

`\WPref` `\WPtref` Finally, the `proposal` package supplies specialized reference macros for work packages and areas. The `\WPref` macro takes a work package identifier as an argument and makes a reference: `\WPref{`⟨*id*⟩`}` abbreviates `\pdataRef{wp}{`⟨*id*⟩`}{label}`. The `\WPtref` macro is similar, but also prints out the (short) title: `\WPref{`⟨*id*⟩`}` abbreviates `\pdataRef{wp}{`⟨*id*⟩`}{label}: \pdataRef{wp}{`⟨*id*⟩`}{title}`.

`\WAref` `\WAtref` Unless the `noworkareas` macro is set, we also have the variants `\WAref` and `\WAtref` for work areas.

2.11 The Work Package Table

`\wpfig` One of the most useful features of the `proposal` class is that we can generate an overview table for the distribution of workloads in the project fully automatically. All it takes is the `\wpfig` macro. We invoke this as `\wpfig[`⟨*opt*⟩`]`, where ⟨*opt*⟩ contains the following keywords:

`pages` makes a column with page numbers of the respective work package/area description.

`type` makes a column with work package/area types

`start`, `end`, and `length` makes a columns with work package/area start/end months and length (in months).

if `caption` is given then the table contains an explicatory caption.

`label` allows to specify a label other than the default `fig:wplist`.

For instance `\wpfig[pages,start,length,caption=Overview of Work Packages]` gives a table with columns for page references, duration information, and a special caption.

`\wpfigstyle` The general appearance of the table `\wpfigstyle` macro takes a token sequence to specialize the global appearance (mostly used for text sizes and color) of the work package table. Cell styling can be tweaked by redefining special internal macros; see section **??**.

2.12 Gantt Charts

Gantt charts are used in proposals to show the distribution of activities in work packages over time.

`gantt` `xscale` `yscale` `step` `draft` A gantt chart is represented by the `gantt` environment that takes a on optional keyval argument. The keys `xscale` and `yscale` are used to specify a scale factors for the chart so that it fits on the page. The `step` key allows to specify the steps (in months) of the vertical auxiliary lines. Finally, the `draft` key specifies that plausibility checks (that can be expensive to run) are carried out. Note that the value does not have to be given, so `\begin{gantt}{draft,yscale=.5,step=3}` is a perfectly good invocation.

`\ganttchart` Usually, the `gantt` environment is not used however, since it is part of the macro that takes the same keys. This generates a whole Gantt chart automatically from the work phase specifications in the work packages. As above we have to run LaTeX two times for the work phases to show up.

2.13 Coherence

\coherencematrix
\jointpub
\jointsub
\jointorga
\jointsoft
\jointsup
\coherencetable

Many proposals require ways to show coherence between the partners. The `proposal` class offers the macro `\coherencematrix` for this which generates a matrix of symbols specifying joint publications, project organization, software/resource development, and supervision of students by the project partners that have been declared by the `\jointpub`, `\jointproj`, `\jointorga` `\jointsoft`, and `\jointsup` macros before. These macros all take a comma-separated list of site identifiers as an argument. Use for instance `\jointproj{a,b,c}` to specify that the sites with the identifiers `a`, `b` and `c` have a joint project. `\coherencetable` is a variant which packages the coherence table in a table figure with label `tab:collaboration`.

\jpub
\jproj
\jorga
\jsoft
\jsup

The symbols used an be configured by redefining `\jpub`, `\jproj`, and `\jorga`, `\jsoft`, and `\jsup`.

2.14 Localization

The `proposal` class offers some basic support for localization. This is still partial though, and I am not sure that this is the best way of setting things up. What I do is to define macros for all generated texts that can be redefined in the proposal classes that build in `proposal`. For instance the `dfgproposal` class [Koh16b] provides an option `german` for german-language proposals and project reports that triggers a redefinition of all of these macros at read time.

3 Limitations and Enhancements

The `proposal` is relatively early in its development, and many enhancements are conceivable. We will list them here.

1. macros cannot be used in work package and work area titles. They really mess up our `\wpfig` automation. The problem is that they are evaluated too early, and our trick with making them undefined while collecting the parts of the table-rows only works if we know which macros we may expect. We might specify all "allowable" macros in an optional key `protectmacro`, which is defined via

   ```
   \define@key{wpfig}{protectmacro}{\epandafter\let\csname #1\endcsname=\relax}
   ```

   But I am not sure that this will work.

2. It would be great, if in the Gantt Charts, we could include some plausibility checks (for draft = not `submit` mode). I can see two at the moment:

   - calculating the effort (i.e. the weight of the black area) and visualizing it. Then we could check whether that is larger than the effort declared for the work package.
   - calculating (and visualizing) the monthly effort. That should be kind of even (or it has to be explained in the positions requested).

3. we currently do not have a way to relate `PI`s to `site`s, but we do not really need to.

If you have other enhancements to propose or feel you can alleviate some limitation, please feel free to contact the author.

Acknowledgements

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4 The Implementation

In this section we describe the implementation of the functionality of the `proposal` package.

4.1 Package Options and Format Initialization

We first set up the options for the package.

```
⟨*cls | reporting⟩
\newif\if@wpsubsection\@wpsubsectionfalse
\newif\ifsubmit\submitfalse
\newif\ifgrantagreement\grantagreementfalse
\newif\ifpublic\publicfalse
\newif\ifkeys\keysfalse
\newif\ifdelivs\delivsfalse
\newif\ifwork@areas\work@areastrue
\newif\if@RAM\@RAMfalse
\newif\if@svninfo\@svninfofalse
\newif\if@gitinfo\@gitinfofalse
\def\proposal@class{article}
\DeclareOption{wpsubsection}{\@wpsubsectiontrue}
\DeclareOption{submit}{\submittrue}
\DeclareOption{grantagreement}{\grantagreementtrue}
\DeclareOption{gitinfo}{\@gitinfotrue}
\DeclareOption{svninfo}{\@svninfotrue}
\DeclareOption{public}{\publictrue}
\DeclareOption{noworkareas}{\work@areasfalse\PassOptionsToClass{\CurrentOption}{pdata}}
\DeclareOption{RAM}{\@RAMtrue}
\DeclareOption{report}{\def\proposal@class{report}}
\DeclareOption{keys}{\keystrue}
\DeclareOption{deliverables}{\delivstrue}
\DeclareOption*{\PassOptionsToClass{\CurrentOption}{article}}
\ProcessOptions
\LoadClass[a4paper,twoside]{\proposal@class}
\RequirePackage{proposal}
⟨/cls | reporting⟩
```

For `proposal.sty` we load the packages we make use of

```
⟨*sty⟩
\RequirePackage{amssymb}
\RequirePackage{wasysym}
\RequirePackage{url}
\RequirePackage{graphicx}
\RequirePackage{colortbl}
\RequirePackage{xcolor}
\RequirePackage{rotating}
\RequirePackage{fancyhdr}
\RequirePackage{array}
\RequirePackage{xspace}
\RequirePackage{comment}
\AtBeginDocument{\ifpublic\excludecomment{private}\fi}
\RequirePackage{tikz}
\RequirePackage{paralist}
\RequirePackage[a4paper,margin=18mm]{geometry}
\RequirePackage{boxedminipage}
% so that ednotes in wps do not run out of symbols
\renewcommand{\thempfootnote}{\roman{mpfootnote}}
\renewcommand{\familydefault}{\sfdefault}
\RequirePackage[scaled=.90]{helvet}
```

```
\RequirePackage{textcomp}
\RequirePackage[hyperref=auto,style=alphabetic,defernumbers=true,backend=bibtex,firstinits=true,maxbibnames=9
\RequirePackage{csquotes}
\RequirePackage{mdframed}
```

in submit mode, we make the links a bit darker, so they print better.

```
\RequirePackage{pdata}
\definecolor{darkblue}{rgb}{0,0,.7}
\ifsubmit\def\prop@link@color{darkblue}\else\def\prop@link@color{blue}\fi
\RequirePackage[bookmarks=true,linkcolor=\prop@link@color,
 citecolor=\prop@link@color,urlcolor=\prop@link@color,colorlinks=true,
 breaklinks=true, bookmarksopen=true]{hyperref}
```

the `ed` package [Koh16a] is very useful for collaborative writing and passing messages between collaborators or simply reminding yourself of editing tasks, so we preload it in the class. However, we only want to show the information in draft mode. Furthermore, we adapt the options for the `svninfo` and `gitinfo2` packages.

```
\ifsubmit
\RequirePackage[hide]{ed}
\if@svninfo\RequirePackage[final,today]{svninfo}\fi
\else
\RequirePackage[show]{ed}
\if@svninfo\RequirePackage[eso-foot,today]{svninfo}\fi
\if@gitinfo\RequirePackage[mark]{gitinfo2}\fi
\fi
\renewcommand\ednoteshape{\sl\footnotesize}
```

private

We configure the `comment` package, so that it provides the `private` environment depending on the status of the `public` option.

```
\ifpublic\excludecomment{private}\else\includecomment{private}\fi
```

And we set up the appearance of the proposal. We want numbered subsubsections.

```
\setcounter{secnumdepth}{3}
```

We specify the page headings.

```
\newif\ifofpage\ofpagefalse
\ifgrantagreement
\fancyhead{}
\renewcommand{\headrulewidth}{0pt}
\renewcommand{\footrulewidth}{0.4pt}
\else
\fancyhead[RE,LO]{\prop@gen@acronym}
\fancyhfoffset{0pt}
\fi
\fancyfoot[C]{}
\newcommand\prop@of@pages[2]{page~#1\ifofpage~of~#2\fi}
\ifgrantagreement
\fancyfoot[L]{\prop@gen@proposalnumber\quad \prop@gen@acronym\quad --\quad Part B}
\fancyfoot[R]{\thepage}
\else
\fancyhead[LE,RO]{\prop@of@pages\thepage{\pdataref@num{prop}{page}{last}}}
\fi
\pagestyle{fancyplain}
```

⟨/sty⟩

4.2 Proposal Metadata

pdata

Most of the metadata functionality is encapsulated into the `pdata` package, which is shared by

the proposal and report classes. `pdata.sty` first loads the `workaddress` package from sTeX and supplies the Euro symbol.

```
⟨*pdata⟩
\RequirePackage{workaddress}[2016/07/06]
\RequirePackage{eurosym}
```

We define the keys for metadata declarations in the `proposal` environment, they park their argument in an internal macro for use in the title page. The `site` key is the most complicated, so we take care of it first: We need a switch `\if@sites` that is set to true when the `site` key is used. Furthermore `site=`⟨*site*⟩ makes new keys ⟨*site*⟩`RM` and ⟨*site*⟩`RAM` (if the `RAM` option was set) for the `workpackage` environment and records the sites in the `\prop@gen@sites` token register.

```
\newif\if@sites\@sitesfalse\let\prop@gen@sites=\relax%
\newcounter{@site}%
\define@key{prop@gen}{site}{\@sitestrue\@dmp{site=#1}%
\stepcounter{@site}\pdata@def{site}{#1}{number}{\the@site}%
\@ifundefined{prop@gen@sites}{\xdef\prop@gen@sites{#1}}{\xdef\prop@gen@sites{\prop@gen@sites,#1}}%
\define@key{prop@gen}{#1RM}{\pdata@def{site}{#1}{intendedRM}{##1}}%
\if@RAM\define@key{prop@gen}{#1RAM}{\pdata@def{site}{#1}{intendedRAM}{##1}}\fi
\define@key{workpackage}{#1RM}{\pdata@def\wp@id{#1}{RM}{##1}}%
\if@RAM\define@key{workpackage}{#1RAM}{\pdata@def\wp@id{#1}{RAM}{##1}}\fi
\define@key{task}{#1RM}{\pdata@def{\wp@id @\task@id}{#1}{RM}{##1}}%
\if@RAM\define@key{task}{#1RAM}{\pdata@def{\wp@id @\task@id}{#1}{RAM}{##1}}\fi
\define@key{prop@gen}{#1employed}{{\let\tabularnewline\relax\let\hline\relax\let\wa@ref\relax%
\@ifundefined{prop@gen@employed@lines}%
{\xdef\prop@gen@employed@lines{\wa@ref3{institution}{#1}{shortname} & ##1\tabularnewline\hline}}%
{\xdef\prop@gen@employed@lines{\prop@gen@employed@lines \wa@ref3{institution}{#1}{shortname} & ##1\tabularnew
```

If there are no sites, then we have to define keys `RM` and `RAM` that store the intended research (assistant months). Unfortunately, we cannot just include this in the `\if@sites` conditional here, since that is only set at runtime.

```
\define@key{prop@gen}{RM}{\@dmp{RM=#1}\if@sites%
\PackageWarning{Do not use the RM key in the presence of sites}\else%
\pdata@def{all}{intended}{RM}{#1}\fi}
\define@key{prop@gen}{RAM}{\@dmp{RAM=#1}\if@sites%
\PackageWarning{Do not use the RAM key in the presence of sites}\else%
\pdata@def{all}{intended}{RAM}{#1}\fi}
```

similarly, the `PI` keys are registered in `\prop@gen@PIs`.

```
\define@key{prop@gen}{PI}{\@dmp{PI=#1}%
\@ifundefined{prop@gen@PIs}{\xdef\prop@gen@PIs{#1}}{\xdef\prop@gen@PIs{\prop@gen@PIs,#1}}}
```

and the `pubspage` keys in `\prop@gen@pubspages`.

```
\define@key{prop@gen}{pubspage}{\@ifundefined{prop@gen@pubspages}%
{\xdef\prop@gen@pubspages{#1}}{\xdef\prop@gen@pubspages{\prop@gen@pubspages,#1}}}
```

the `importfrom` key reads the proposal data from its argument.

```
\define@key{prop@gen}{importfrom}{\message{importing proposal data from #1.pdata}\readpdata{#1}}
```

The rest of the keys just store their value.

```
\define@key{prop@gen}{instrument}{\def\prop@gen@instrument{#1}%
\pdata@def{prop}{gen}{instrument}{#1}\@dmp{inst=#1}}
\define@key{prop@gen}{title}{\def\prop@gen@title{#1}%
\pdata@def{prop}{gen}{title}{#1}}
\define@key{prop@gen}{acronym}{\gdef\prop@gen@acronym{#1}%
\pdata@def{prop}{gen}{acronym}{#1}\@dmp{acro=#1}}
\define@key{prop@gen}{acrolong}{\def\prop@gen@acrolong{#1}%
\pdata@def{prop}{gen}{acrolong}{#1}}
\define@key{prop@gen}{proposalnumber}{\def\prop@gen@proposalnumber{#1}%
\pdata@def{prop}{gen}{proposalnumber}{#1}}
\define@key{prop@gen}{discipline}{\def\prop@gen@discipline{#1}%
```

```
\pdata@def{prop}{gen}{discipline}{#1}}
\define@key{prop@gen}{areas}{\def\prop@gen@areas{#1}%
\pdata@def{prop}{gen}{areas}{#1}}
\define@key{prop@gen}{start}{\def\prop@gen@start{#1}%
\pdata@def{prop}{gen}{start}{#1}}
\define@key{prop@gen}{months}{\def\prop@gen@months{#1}%
\pdata@def{prop}{gen}{months}{#1}}
\define@key{prop@gen}{since}{\def\prop@gen@since{#1}%
\pdata@def{prop}{gen}{since}{#1}}
\define@key{prop@gen}{totalduration}{\def\prop@gen@totalduration{#1}%
\pdata@def{prop}{gen}{totalduration}{#1}}
\define@key{prop@gen}{fundsuntil}{\def\prop@gen@fundsuntil{#1}%
\pdata@def{prop}{gen}{fundsuntil}{#1}}
\define@key{prop@gen}{topdownPM}[true]{\def\prop@gen@topdownPM{#1}}
\define@key{prop@gen}{botupPM}[true]{\def\prop@gen@botupPM{#1}}
\define@key{prop@gen}{keywords}{\def\prop@gen@keywords{#1}}
```

and the default values, these will be used, if the author does not specify something better.

```
\newcommand\prop@gen@acro@default{ACRONYM}
\def\prop@gen@acro{\prop@gen@acro@default}
\newcommand\prop@gen@months@default{???months???}
\def\prop@gen@months{\prop@gen@months@default}
\newcommand\prop@gen@title@default{???Proposal Title???}
\def\prop@gen@title{\prop@gen@title@default}
\newcommand\prop@gen@instrument@default{??? Instrument ???}
\def\prop@gen@instrument{\prop@gen@instrument@default}
```

`\prop@tl` An auxiliary macro that is handy for making tables of WorkAddress data.

```
\newcommand\prop@tl[2]{\xdef\tab@line{}
\@for\tl@ext:={#1}\do{\xdef\tab@line{\tab@line&#2}}
\tab@line}
```

4.3 Proposal Appearance

We define the keys for the proposal appearance

```
\def\prop@gen@compactht{false}
\define@key{prop@gen}{compactht}[true]{\def\prop@gen@compactht{#1}}
⟨/pdata⟩
```

`emphbox`

```
⟨*sty⟩
\newmdenv[settings=\large]{emphbox}
```

4.4 The proposal Environment and Title Page

`prop@proposal` This internal environment is called in the `proposal` environment from the `proposal` class. The implementation here is only a stub to be substituted in a specialized class.

```
\newenvironment{prop@proposal}
{\thispagestyle{empty}%
\begin{center}
  {\LARGE \prop@gen@instrument}\\[.2cm]
  {\LARGE\textbf{\prop@gen@title}}\\[.3cm]
  {\LARGE Acronym: {\prop@gen@acronym}}\\[.2cm]
  {\large\today}\\[1em]
  \begin{tabular}{c*{\the@PIs}{c}}
    \prop@tl\prop@gen@PIs{\wa@ref3{person}\tl@ext{name}}\\
    \prop@tl\prop@gen@PIs{\wa@ref3{institution}{\wa@ref3{person}\tl@ext{affiliation}}{name}}
```

```
 \end{tabular}\\[2cm]
\end{center}
\setcounter{tocdepth}{2}\tableofcontents\newpage\setcounter{page}{1}}
```

Now we come to the end of the environment:

```
{\section{List of Attachments}
\begin{itemize}
\@for\@I:=\prop@gen@PIs\do{%
\item Curriculum Vitae and list of publications for
  \wa@ref3{person}\@I{personaltitle} \wa@ref3{person}\@I{name}}
\end{itemize}\newpage
\printbibliography[heading=warnpubs]}
```

proposal

The `proposal` environment reads the metadata keys defined above, and if there were no `site` keys, then it defines keys `RM` and `RAM` (unless the `noRAM` package option was given) for the `workpackage` environment. Also it reads the project data file and opens up the project data file `\pdata@out`, which it also closes at the end.

The environment calls an internal version of the environment `prop@proposal` that can be customized by the specializing classes.

```
\newenvironment{proposal}[1][]{\readpdata\jobname
\ofpagetrue\setkeys{prop@gen}{#1}
\pdata@open\jobname
\if@sites\else
\define@key{workpackage}{RM}{\pdata@def{wp}\wp@id{RM}{##1}\@dmp{RM=##1}}
\if@RAM\define@key{workpackage}{RAM}{\pdata@def{wp}\wp@id{RAM}{##1}\@dmp{RAM=##1}}\fi
\define@key{task}{RM}{\pdata@def{task}{\wp@id @\task@id}{RM}{##1}\@dmp{RM=##1}}
\if@RAM\define@key{task}{RAM}{\pdata@def{wp}{\wp@id @\task@id}{RAM}{##1}\@dmp{RAM=##1}}\fi
\fi
\newcounter{@PIs}
\@ifundefined{prop@gen@PIs}{}{\@for\@I:=\prop@gen@PIs\do{\stepcounter{@PIs}}}
\newcounter{@sites}
\@ifundefined{prop@gen@sites}{}{\@for\@I:=\prop@gen@sites\do{\stepcounter{@sites}}}
\setcounter{page}{0}
\begin{prop@proposal}}
```

Now we come to the end of the environment, we take care of the last page and print the references.

```
{\end{prop@proposal}
\pdata@def{prop}{page}{last}{\thepage}\ofpagefalse
\pdata@close}
⟨/sty⟩
```

The `report` environment is similar, but somewhat simpler

report

```
⟨*reporting⟩
\newif\if@report\@reportfalse
\newenvironment{report}[1][]%
{\@reporttrue\readpdata\jobname%
\ofpagetrue\setkeys{prop@gen}{#1}%
\pdata@open\jobname%
\@ifundefined{prop@gen@PIs}{}{\newcounter{@PIs}\@for\@I:=\prop@gen@PIs\do{\stepcounter{@PIs}}}%
\@ifundefined{prop@gen@sites}{}{\newcounter{@sites}\@for\@I:=\prop@gen@sites\do{\stepcounter{@sites}}}%
\setcounter{page}{0}%
\begin{prop@report}}
{\end{prop@report}%
\pdata@def{prop}{page}{last}{\thepage}\ofpagefalse\newpage
\printbibliography[heading=warnpubs]
\pdata@close}
```

prop@report

```
\newenvironment{prop@report}
{\begin{center}
  {\LARGE Final Project Report}\\[.2cm]
  {\LARGE\textbf{\prop@gen@title}}\\[.3cm]
  {\LARGE Acronym: {\prop@gen@acronym}}\\[.2cm]
  {\large\today}\\[1em]
  \begin{tabular}{c*{\the@PIs}{c}}
    \prop@tl\prop@gen@PIs{\wa@ref3{person}\tl@ext{name}}\\
    \prop@tl\prop@gen@PIs{\wa@ref3{institution}{\wa@ref3{person}\tl@ext{affiliation}}{name}}
 \end{tabular}\\[2cm]
\end{center}
\setcounter{tocdepth}{2}\tableofcontents\newpage\setcounter{page}{1}}
{}
```

⟨/reporting⟩

\site*

⟨*sty⟩

```
\newcommand\site[1]{\hyperlink{site@#1@target}{\wa@ref3{institution}{#1}{acronym}}}
\newcommand\sitename[1]{\hyperlink{site@#1@target}{\wa@ref3{institution}{#1}{name}}}
```

4.5 Objectives

We first define a presentation macro for objectives

\objective@label

```
\newcommand\objective@label[1]{O#1}
```

We define the keys for the objectives environment

```
\define@key{obj}{id}{\def\obj@id{#1}\@dmp{id=#1}}
\define@key{obj}{title}{\def\obj@title{#1}\@dmp{title=#1}}
\define@key{obj}{short}{\def\obj@short{#1}\@dmp{short=#1}}
```

And a counter for numbering objectives

```
\newcounter{objective}
```

objective

```
\newenvironment{objective}[1][]
{\let\obj@id\relax\let\obj@title\relax\let\obj@short\relax%
\setkeys{obj}{#1}\stepcounter{objective}%
\goodbreak\smallskip\par\noindent%
\textbf{\objective@label{\arabic{objective}}:%
~\pdata@target{obj}{\obj@id}{\pdataref{obj}{\obj@id}{title}}\ignorespaces}%
\pdata@def{obj}\obj@id{label}{\objective@label\theobjective}%
\@ifundefined{obj@title}{}{\pdata@def{obj}\obj@id{title}\obj@title}%
\@ifundefined{obj@short}{}{\pdata@def{obj}\obj@id{short}\obj@short}}
{}
```

\OBJref

```
\newcommand\OBJref[1]{\pdataRef{obj}{#1}{label}}
\newcommand\OBJtref[1]{\OBJref{#1}: \pdataRefFB{obj}{#1}{short}{title}}
```

4.6 Work Areas and Work Packages

We first define keys for work areas (if we are in larger project).

```
\ifwork@areas
\define@key{workarea}{id}{\def\wa@id{#1}\@dmp{id=#1}}
\define@key{workarea}{title}{\pdata@def{wa}\wa@id{title}{#1}}
```

```
\define@key{workarea}{short}{\pdata@def{wa}\wa@id{short}{#1}}
\define@key{workarea}{lead}{\pdata@def{wa}\wa@id{lead}{#1}}
\fi
```

work packages have similar ones.

```
\define@key{workpackage}{id}{\def\wp@id{#1}\@dmp{id=#1}}
\define@key{workpackage}{title}{\pdata@def{wp}\wp@id{title}{#1}}
\define@key{workpackage}{short}{\pdata@def{wp}\wp@id{short}{#1}}
\define@key{workpackage}{lead}{\pdata@def{wp}\wp@id{lead}{#1}\def\wp@lead{#1}\@dmp{lead=#1}}
\define@key{workpackage}{type}{\def\wp@type{#1}\pdata@def{wp}\wp@id{type}{#1}}
\define@key{workpackage}{wphases}{\def\wp@wphases{#1}\pdata@def{wp}\wp@id{wphases}{#1}}
\define@key{workpackage}{swsites}[true]{\def\wp@swsites{#1}}
```

We define the constructors for the work package and work area labels and titles.

```
\newcommand\wp@mk@title[1]{Work Package {#1}}
\newcommand\wp@label[1]{WP{#1}}
\ifwork@areas
\newcommand\wa@label[1]{WA{#1}}
\newcommand\wa@mk@title[1]{Work Area {#1}}
\fi
```

The `wa` and `wp` counters are for the work packages and work areas, the counter `deliv` for deliverables.

```
\ifwork@areas\newcounter{wa}\newcounter{wp}[wa]\else\newcounter{wp}\fi
\ifdelivs\newcounter{deliv}[wp]\fi
\newcounter{allwp}
```

`\update@*` update the list `\@wps` of the work packages in the local group and the list `\@was` work areas for the staff efforts table: if `\@wps` is undefined, then initialize the comma-separated list, otherwise extend it.[4]

EdN:4

```
\newcommand\update@wps[1]{\@ifundefined{@wps}{\xdef\@wps{#1}}{\xdef\@wps{\@wps,#1}}}
\newcommand\update@tasks[1]{\@ifundefined{@tasks}{\xdef\@tasks{#1}}{\xdef\@tasks{\@tasks,#1}}}
\newcommand\update@deps[1]{\@ifundefined{task@deps}{\xdef\task@deps{#1}}{\xdef\task@deps{\task@deps,#1}}}
\ifwork@areas\def\update@was#1{\@ifundefined{@was}{\xdef\@was{#1}}{\xdef\@was{\@was,#1}}}\fi
```

`\decode@wphase` `\decode@wphase` decodes a string of the form ⟨*start*⟩`-`⟨*end*⟩`!`⟨*force*⟩ and defines the macros `\wphase@start`, `\wphase@end`, and `\wphase@force` with the three parts and also computes `\wphase@len`. The intermediate parsing macro `\decode@p@start` parses out the start (a number), and passes on to `\decode@p@end`, which parses out the end (another number) and the force string, which is either empty (if the `!`⟨*force*⟩ part is omitted) or of the form `!`⟨*force*⟩. In the first case the default value 1 is returned for `\decode@force` in the second ⟨*force*⟩.

```
\newcommand\decode@wphase[1]{\expandafter\decode@p@start#1@%
\local@count\wphase@end\advance\local@count by -\wphase@start%
\def\wphase@len{\the\local@count}}
\def\decode@p@start#1-#2@{\def\wphase@start{#1}\decode@p@end#2!@}
\def\decode@p@end#1!#2@{\def\wphase@end{#1}\def\@test{#2}%
\ifx\@test\@empty\def\wphase@force{1}\else\decode@p@force#2\fi}
\def\decode@p@force#1!{\def\wphase@force{#1}}
```

`\startend@wphases` We first iteratively decode the work phases, so that the last definition of `\wphase@end` remains, then we parse out the start of the first workphase to define `\wphase@start`

```
\def\wphases@start#1-#2@{\def\wphase@start{#1}}
\newcommand\startend@wphases[1]{\def\@test{#1}
\ifx\@test\@empty\def\wphase@start{0}\def\wphase@end{0}\else%
\@for\@I:=#1\do{\expandafter\decode@p@start\@I @}
\expandafter\wphases@start#1@\fi}
```

[4] EdNote: with the current architecture, we cannot have work areas that do not contain work packages, this leads to the error that `wps` is undefined in `endworkplan`

with these it is now relatively simple to define the interface macros.

work@package The workpackage environment collects the keywords, steps the counters, writes the metadata to the aux file, updates the work packages in the local group, generates the work package number \wp@num.

```
\newcounter{wp@RM}
\if@RAM\newcounter{wp@RAM}\fi
\newenvironment{work@package}[1][]%
{\def\wp@wphases{0-0}% default values
\def\wp@swsites{false}
\setkeys{workpackage}{#1}\stepcounter{wp}\stepcounter{allwp}%
\startend@wphases\wp@wphases%
\pdata@def{wp}\wp@id{start}\wphase@start\pdata@def{wp}\wp@id{end}\wphase@end%
\@ifundefined{wp@type}{}{\pdata@def{wp}\wp@id{type}\wp@type}%
\let\@tasks=\relax%
\edef\wp@num{\ifwork@areas\thewa.\fi\thewp}%
\pdata@def{wp}\wp@id{label}{\wp@label\wp@num}%
\pdata@def{wp}\wp@id{number}{\thewp}%
\pdata@def{wp}\wp@id{page}{\thepage}%
\update@wps\wp@id%
\edef\wp@num{\ifwork@areas\thewa.\fi\thewp}%
\pdata@def{wp}{\wp@id}{num}{\thewp}%
```

If we have sites, we have to compute the total RM and RAM for this WP.

```
\if@sites%
\setcounter{wp@RM}{0}\if@RAM\setcounter{wp@RAM}{0}\fi%
\@for\@site:=\prop@gen@sites\do{%
\edef\@RM{\pdataref@num\wp@id\@site{RM}}\addtocounter{wp@RM}{\@RM}%
\if@RAM\edef\@RAM{\pdataref@num\wp@id\@site{RAM}}\addtocounter{wp@RAM}{\@RAM}\fi}
\pdata@def{wp}\wp@id{RM}{\thewp@RM}%
\if@RAM\pdata@def{wp}\wp@id{RAM}{\thewp@RAM}\fi%
\fi}% if@sites
{\@ifundefined{@tasks}{}{\pdata@def{\wp@id}{task}{ids}\@tasks}}
```

workpackage With this, it becomes simple to define a work package environment. We consider two cases, if we have sites, then we make a header table. If not, we can make things much simpler: we just generate a subsection

```
\newenvironment{workpackage}[1][]%
{\begin{work@package}[#1]%
\ifgrantagreement\else%
%\if@wpsubsection\subsubsection*{{\wp@mk@title\thewp}: \pdataref{wp}\wp@id{title}}\fi
\if@sites\goodbreak\medskip\wpheadertable%
\else\subsubsection*{{\wptitle} (\wprm)}\fi%
\addcontentsline{toc}{paragraph}{{\wp@mk@title\thewp}: \pdataref{wp}\wp@id{title}}%
\noindent\ignorespaces%
\fi}
{\end{work@package}}
```

EdN:5 \wptitle [5]

```
\newcommand\wptitle{\wp@mk@title{\wp@num}: \pdata@target{wp}{\wp@id}{\pdataref{wp}\wp@id{title}}}
```

EdN:6 \wprm [6]

```
\newcommand\wprm{\pdataref@safe{wp}\wp@id{RM}\if@RAM\ RM+\pdataref{wp}\wp@id{RAM} RAM\fi}
```

[5] EdNote: document above
[6] EdNote: document above

`@site@contributes` Called as `\if@site@contributes{`⟨*site*⟩`}{`⟨*tokens*⟩`}` the following happens: If `\prop@gen@compactht` is `\@true` (set by the `compactht` attribute on the `proposal` environment), then ⟨*tokens*⟩ is processed. Otherwise, ⟨*tokens*⟩ is only processed if ⟨*site*⟩ contributes to the current work package (i.e the `RM` $\neq 0$ and `RAM` $\neq 0$)

```
\newcount\site@contribution%
\newcommand\if@site@contributes[2]{%
\ifx\prop@gen@compactht\@true
\if@RAM\ifnum\pdataref@num\wp@id{#1}{RM} > 0 \ifnum \pdataref@num\wp@id{#1}{RAM} > 0 #2\fi\fi
\else\ifnum\pdataref@num\wp@id{#1}{RM} > 0 #2\fi\fi
\else #2\fi}
```

`\wp@sites@line` `\wp@efforts@line` `\wp@sites@num` The following macro computes the sites line (in the token register `\wp@sites@line`), the efforts line (in `\wp@efforts@line`), and the sites number (in the counter `\sites@num`) for later inclusion in the `\wpheadertable`. If `\prop@gen@compactht` is `\@true`, then no sites without contributions are listed in the table.

```
\newcounter{wp@sites@num}
\newcommand\wp@sites@efforts@lines{%
\setcounter{wp@sites@num}{0}
{\let\G@refundefinedtrue=\relax\let\@latex@warning=\relax\let\@sw\relax%
\let\site\relax\let\textbf\relax\let\sum@style\relax\let\lead@style\relax%
\let\pn\relax\let\sys\relax%
\xdef\wp@sites@line{\wp@legend@site}\xdef\wp@efforts@line{\wp@legend@effort}%initialize lines
\@for\@site:=\prop@gen@sites\do{\if@site@contributes\@site{\stepcounter{wp@sites@num}}%
\xdef\wp@sites@line{\wp@sites@line%
\if@site@contributes\@site{&%
\ifx\wp@swsites\@true%
\@sw{\ifx\@site\wp@lead\lead@style{\site{\@site}}\else\site{\@site}\fi}%
\else\ifx\@site\wp@lead\lead@style{\site{\@site}}\else\site{\@site}\fi%
\fi}}%
\xdef\wp@efforts@line{\wp@efforts@line%
\if@site@contributes\@site{&%
\ifx\@site\wp@lead%
\lead@style{\pdataref@safe\wp@id\@site{RM}\if@RAM+\pdataref@safe\wp@id\@site{RAM}\fi}
\else\pdataref@safe\wp@id\@site{RM}\if@RAM+\pdataref@safe\wp@id\@site{RAM}\fi\fi}}%
}% do
\xdef\wp@sites@line{\wp@sites@line&\sum@style{\wp@legend@all}}%
\xdef\wp@efforts@line{\wp@efforts@line&
\sum@style{\textbf{\pdataref{wp}\wp@id{RM}\if@RAM+\pdataref{wp}\wp@id{RAM}\fi}}}}}
```

`\wpheadertable` This macro computes the default work package header table, if there are sites.

```
\newcommand\wpheadertable{%
\wp@sites@efforts@lines%
\par\noindent\begin{tabular}{|l||l|*{\thewp@sites@num}{c|}|c|}\hline%
\textbf{\wp@mk@title{\wp@num}}&\wp@sites@line\\\hline%
\textsf{\pdata@target{wp}{\wp@id}{\pdataref{wp}\wp@id{title}}} &\wp@efforts@line\\\hline%
\end{tabular}\smallskip\par\noindent\ignorespaces}
```

and now multilinguality support

```
\newcommand\wp@legend@site{Site}
\newcommand\wp@legend@effort{Effort\if@RAM{ (RM+RAM)}\fi}
\newcommand\wp@legend@all{\textbf{all}}
```

`workarea` the `workarea` environment for work areas is almost the same, but we also have to initialize the work package counters. Also, the efforts can be computed from the work packages in this group via the `wa@effort` counter

```
\newcounter{prop@RM}\if@RAM\newcounter{prop@RAM}\fi
\ifwork@areas
\newcounter{wa@RM}\if@RAM\newcounter{wa@RAM}\fi\newcounter{wa@wps}
```

```
\newenvironment{workarea}[1][]
{\setkeys{workarea}{#1}
\let\@wps=\relax
\stepcounter{wa}
\pdata@def{wa}{\wa@id}{label}{\wa@label\thewa}
\pdata@def{wa}{\wa@id}{number}{\thewa}
\pdata@def{wa}{\wa@id}{page}{\thepage}
\update@was{\wa@id}
\pdata@def{wa}{\wa@id}{num}{\thewa}
\setcounter{wa@RM}{0}\if@RAM\setcounter{wa@RAM}{0}\fi\setcounter{wa@wps}{0}
\edef\@@wps{\pdataref@aux\wa@id{wp}{ids}}
\@for\@wp:=\@@wps\do{\stepcounter{wa@wps}%
\if@sites
\@for\@site:=\prop@gen@sites\do{%
  \edef\@RM{\pdataref@num\@wp\@site{RM}}
  \if@RAM\edef\@RAM{\pdataref@num\@wp\@site{RAM}}\fi
  \addtocounter{wa@RM}{\@RM}\addtocounter{prop@RM}{\@RM}
  \if@RAM\addtocounter{wa@RAM}{\@RAM}\addtocounter{prop@RAM}{\@RAM}\fi}
\else
\edef\@RM{\pdataref@num{wp}\@wp{RM}}
\if@RAM\edef\@RAM{\pdataref@num{wp}\@wp{RAM}}\fi
\addtocounter{wa@RM}{\@RM}\addtocounter{prop@RM}{\@RM}
\if@RAM\addtocounter{wa@RAM}{\@RAM}\addtocounter{prop@RAM}{\@RAM}\fi
\fi}
\pdata@def{wa}\wa@id{RM}\thewa@RM
\pdata@def{prop}{all}{RM}\theprop@RM
\if@RAM
\pdata@def{wa}\wa@id{RAM}\thewa@RAM
\pdata@def{prop}{all}{RAM}\theprop@RAM
\fi
\subsubsection*{{\wa@mk@title\thewa}: {\pdata@target{wa}\wa@id{\pdataref{wa}\wa@id{title}}}}
\addcontentsline{toc}{subsubsection}{{\wa@mk@title\thewa}: \pdataref{wa}\wa@id{title}}%
\ignorespaces}
{\@ifundefined{@wps}{}{\pdata@def\wa@id{wp}{ids}\@wps}\pdata@def\wa@id{wp}{count}\thewa@wps}\fi
```

workplan The `workplan` environment sets up the accumulator macros `\@wps`, `\@was`, for the collecting the identifiers of work packages and work areas. At the end of the workplan description it writes out their content to the aux file for reference.

```
\ifdelivs\newwrite\wpg@delivs\fi
\newenvironment{workplan}%
{\ifdelivs\immediate\openout\wpg@delivs=\jobname.delivs\fi
\ifwork@areas\let\@was=\relax\else\let\@wps=\relax\fi}%
{\@ifundefined{task@deps}{}{\pdata@def{all}{task}{deps}{\task@deps}}
\pdata@def{all}{task}{count}{\thealltasks}
\ifwork@areas
\@ifundefined{@was}{}{\pdata@def{all}{wa}{ids}\@was}
\else
\@ifundefined{@wps}{}{\pdata@def{all}{wp}{ids}\@wps}
\fi
\ifdelivs\@ifundefined{mile@stones}{}
{\@for\@I:=\mile@stones\do{%
\pdata@def{mile}\@I{delivs}{\@ifundefined{\@I delivs}{}{\csname\@I delivs\endcsname}}}}\fi
\ifwork@areas\pdata@def{all}{wa}{count}{\thewa}\fi
\pdata@def{all}{wp}{count}{\theallwp}
\ifdelivs
\pdata@def{all}{deliverables}{count}{\thedeliverable}
\pdata@def{all}{milestones}{count}{\themilestone}
\fi
```

```
\ifdelivs\closeout\wpg@delivs\fi}
```

4.7 Tasks

tasklist

```
\newenvironment{tasklist}
{\smallskip\begin{compactenum}}{\end{compactenum}\smallskip}
```

The next step is to

```
\ifwork@areas
\newcommand\task@label[3]{\textbf{T#1.#2.#3}}
\else
\newcommand\task@label[2]{\textbf{T#1.#2}}
\fi
```

We define the keys for the task macro

```
\define@key{task}{id}{\def\task@id{#1}\@dmp{id=#1}}
\define@key{task}{wphases}{\def\task@wphases{#1}\@dmp{wphases=#1}}
\define@key{task}{requires}{\@requires\task@id{#1}\@dmp{req=#1}}
\define@key{task}{title}{\def\task@title{#1}}
\define@key{task}{lead}{\def\task@lead{#1}}
\define@key{task}{partners}{\def\task@partners{#1}}
\define@key{task}{PM}{\def\task@PM{#1}}
\define@key{task}{issue}{\def\task@issue{#1}}
\def\task@set#1{\edef\task@id{task\thetask@all}
\def\task@wphases{0-0}\def\task@partners{}\def\task@lead{}\def\task@PM{}\def\task@title{}
\setkeys{task}{#1}}
```

@post@title@space make the space after the title tweakable

```
\def\task@post@title@space{\;}
```

task The task environment. We first set up config stuff

```
\newcounter{alltasks}
\def\task@post@title@space{ }
\newcommand\task@legend@partners{Sites: }
\newcommand\task@legend@PM{PM}
```

now comes the environment proper. We first call \@task on the keyval argument to do the metadata handling. Then we start formatting the task as an item in the description list from the tasklist environment, and print the title if there is one

```
\newenvironment{task}[1][]%
{\stepcounter{alltasks}%
\@task{#1}%
\item[\pdata@target{task}{\taskin\task@id\wp@id}%
{\ifwork@areas\task@label\thewa\thewp\thetask@wp\else\task@label\thewp\thetask@wp\fi}]%
\ifx\task@title\@empty\else\textbf\task@title\fi\task@post@title@space%
```

now we decode and show the work phases on the task, if they have been specified.

```
\def\@initial{0-0}%
\ifx\task@wphases\@initial\else%
\let\@@sep=\relax\@for\@I:=\task@wphases%
\do{\decode@wphase\@I%
\@@sep\show@wphase\wphase@start\wphase@end\wphase@force%
\let\@@sep=\sep@wphases}%
\fi% initial
```

in non-submit mode we give the specified PM for cross-checking

```
\ifsubmit\else\ifx\task@PM\@empty\else\task@PM~\task@legend@PM;\fi\fi%
```

and we list the partners who contribute if they are specified.

```
\if@sites%
\ifx\task@lead\@empty\else\ \task@legend@partners\site\task@lead~(\legend@lead)%
\@for\@I:=\task@partners\do{, \site\@I}\\\fi%
```

if there are no partners, then we show the RM/RAM contributions specified (if any)

```
\ifx\task@partners\@empty
\xdef\@@involvement{}\xdef\@@inv{}%
\xdef\@@sep{, }\def\m@sep{}% do not show the sep the first time around
\edef\@@sites{\prop@gen@sites}%
\@for\@site:=\@@sites\do{%
\edef\@@RM{\pdataref@safe{\wp@id @\task@id}\@site{RM}}%
\ifx\@@RM\@empty\else\xdef\@@inv{showit}%
\xdef\@@involvement{\@@involvement% and
\m@sep\@site: \@@RM\if@RAM\ifx\@@RAM\@empty\else/\@@RM\fi\fi}
\let\m@sep=\@@sep% but the second time show it.
\fi}% \@@RM empty
\ifx\@@inv\@empty\else(RM{\if@RAM/RAM\fi} distribution: \@@involvement)\strut\\\fi
\fi% no partners key
\fi% sites
```

finally, we ignore any spaces that may follow the the `task` environment

```
\ignorespaces}
{\smallskip}
```

now the multilingual support and presentation configuration

```
\newcommand\month@label[1]{M#1}
\newcommand\show@wphase[3]{\edef\@test{#3}\def\@one{1}%
\month@label{#1}-\month@label{#2}%
\ifx\@test\@empty\else\ifx\@test\@one\else @#3\fi\fi}
\newcommand\sep@wphases{; }
\newcommand\legend@partners{Partners}
\newcommand\legend@lead{lead}
\newcommand\task@label@long{Task}
```

`\@task` The `\@task` macro is a internal macro which takes a bunch of keyword keys and writes their values to the aux file.

```
\newcounter{task@all}\newcounter{task@wp}[wp]
\newcount\task@@end
\def\@task#1{\stepcounter{task@all}\stepcounter{task@wp}%
\task@set{#1}%
\pdata@def{task}{\taskin\task@id\wp@id}{title}{\task@title}
\pdata@def{task}{\taskin\task@id\wp@id}{lead}{\task@lead}
\pdata@def{task}{\taskin\task@id\wp@id}{partners}{\task@partners}
\pdata@def{task}{\taskin\task@id\wp@id}{PM}{\task@PM}
\pdata@def{task}{\taskin\task@id\wp@id}{wphases}{\task@wphases}
\@ifundefined{task@issue}{}
{\pdata@def{task}{\taskin\task@id\wp@id}{issue}{\task@issue}}%
\ifwork@areas
\pdata@def{task}{\taskin\task@id\wp@id}{label}{\task@label\thewa\thewp\thetask@wp}%
\else
\pdata@def{task}{\taskin\task@id\wp@id}{label}{\task@label\thewp\thetask@wp}%
\fi
\pdata@def{task}{\taskin\task@id\wp@id}{number}{\thetask@wp}%
\pdata@def{task}{\taskin\task@id\wp@id}{page}{\thepage}%
\update@tasks{\taskin\task@id\wp@id}}
```

4.8 Work Phase Metadata

\workphase

```
\newcommand\workphase[1]{\PackageError{proposal}
  {The \protect\workphase macro is deprecated,\MessageBreak
    use the attributes wphase on the workpackage environment instead!}}
```

*task*ref

```
\newcommand\taskin[2]{#2@#1}
\newcommand\taskref[2]{\pdataRef{task}{#1@#2}{label}}
\newcommand\taskreflong[2]{\pdataRef{task}{#2}{label}}
\newcommand\tasktref[2]{\taskref{#1}{#2}: \pdataRefFB{task}{#1@#2}{short}{title}}
\newcommand\localtaskref[1]{\taskref{\wp@id}{#1}}
\newcommand\localtasktref[1]{\tasktref{\wp@id}{#1}}
```

now we initialize experimental infrastructure for task dependencies (not very well used/tested)

```
\newcounter{gantt@deps}
\def\@requires#1#2{\stepcounter{gantt@deps}%
\edef\dep@id{taskdep\thegantt@deps}%
\pdata@def{taskdep}\dep@id{from}{\taskin{#1}\wp@id}%
\pdata@def{taskdep}\dep@id{to}{#2}%
\update@deps\dep@id}
```

4.9 Milestones and Deliverables

deliv@error this macro raises an error if deliverable commands are used without the `deliverables` option being set.

```
\newcommand\deliv@error{\PackageError{proposal}
{To use use deliverables, you have to specify the option 'deliverables'}}
```

wpdelivs

```
\newenvironment{wpdelivs}{\begin{wp@delivs}}{\end{wp@delivs}}
```

wp@delivs

```
\newenvironment{wp@delivs}
{\ifdelivs\textbf\deliv@legend@delivs:\\[-3ex]%
\begin{compactdesc}\else\deliv@error\fi}
{\ifdelivs\end{compactdesc}\fi}
```

and now multilinguality support

```
\newcommand\deliv@legend@delivs{Deliverables}
```

\wadelivs

```
\newenvironment{wadelivs}
{\textbf\deliv@legend@delivs:\\[-3ex]\begin{wp@delivs}}
{\end{wp@delivs}}
```

\lec This macro is generally useful to put a comment at the end of the line, possibly making a new one if there is not enough space.

```
\newcommand\lec[1]{\strut\hfil\strut\null\nobreak\hfill\hbox{$\leadsto$#1}\par}
```

\deliv@label

```
\newcommand\deliv@label[1]{D{#1}}
```

*deliv*ref This macro is generally useful to put a comment at the end of the line, possibly making a new one if there is not enough space.

```
\newcommand\delivref[2]{\pdataRef{deliv}{#1@#2}{label}}
\newcommand\localdelivref[1]{\delivref{\wp@id}{#1}}
\newcommand\delivtref[2]{\delivref{#1}{#2}: \pdataRefFB{deliv}{#1@#2}{short}{title}}
\newcommand\localdelivtref[1]{\delivtref{\wp@id}{#1}}
```

\wpg@deliv We first define the keys

```
\define@key{deliv}{id}{\def\deliv@id{#1}}
\define@key{deliv}{due}{\def\deliv@due{#1}}
\define@key{deliv}{dissem}{\def\deliv@dissem{#1}}
\define@key{deliv}{nature}{\def\deliv@nature{#1}}
\define@key{deliv}{miles}{\def\deliv@miles{#1}}
\define@key{deliv}{short}{\def\deliv@short{#1}}
\define@key{deliv}{lead}{\def\deliv@lead{#1}}
\define@key{deliv}{issue}{\def\deliv@issue{#1}}
```

The \wpdeliv macro cycles over the due dates and generates the relevant entries into the deliverables file. The first step is to write the general metadata to the pdata file.

```
\newcounter{deliverable}
\newcommand{\wpg@deliv}[3]{% keys, title, type
\stepcounter{deliverable}
\let\deliv@miles=\relax% clean state
\def\@type{#3}\def\@wp{wp}% set up ifx
\def\wpg@id{\csname #3@id\endcsname}
\setkeys{deliv}{#1}\stepcounter{deliv}% set state
\ifx\@type\@wp\def\current@label{\deliv@label{\ifwork@areas\thewa.\fi\thewp.\thedeliv}}
\else\def\current@label{\deliv@label{\thewa.\thedeliv}}\fi
\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{label}{\current@label}
\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{title}{#2}
\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{page}{\thepage}%
\@ifundefined{deliv@short}
{\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{short}{#2}}
{\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{short}{\deliv@short}}
\@ifundefined{deliv@nature}
{\protect\G@refundefinedtrue\@latex@warning{key 'nature' for Deliv \wpg@id undefined}}
{\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{nature}{\deliv@nature}}
\@ifundefined{deliv@dissem}
{\protect\G@refundefinedtrue\@latex@warning{key 'dissem' for Deliv \wpg@id undefined}}
{\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{dissem}{\deliv@dissem}}
\@ifundefined{deliv@lead}
{\protect\G@refundefinedtrue\@latex@warning{key 'lead' for Deliv \wpg@id  undefined}}
{\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{lead}{\deliv@lead}}
```

Then we iterate over the due dates and generate an entry for teach of them.

```
\@ifundefined{deliv@due}{}{%
\@ifundefined{deliv@issue}{}{\pdata@def{deliv}{\taskin\deliv@id\wpg@id}{issue}{\deliv@issue}}
\@for\@I:=\deliv@due\do{\protected@write\wpg@delivs{}{\string\deliverable%
{\ifnum\@I<10 0\@I\else\@I\fi}% sort key
{\@I}% due date
{\current@label}% label
{\@ifundefined{deliv@id}{??}{\taskin\deliv@id\wpg@id}}% id
{\@ifundefined{deliv@dissem}{??}{\deliv@dissem}}% dissemination level
{\@ifundefined{deliv@nature}{??}{\deliv@nature}}% nature
{#2}
{\ifx\@type\@wp{WP\ifwork@areas\thewa.\fi\thewp}\else{WA\thewa}\fi}%WP
{\@ifundefined{deliv@lead}{??}{\string\site{\deliv@lead}}}}}}% lead
```

And finally, we generate the entry into the deliverables table.

```
\item[\current@label\ (%
\delivs@legend@due: \@ifundefined{deliv@due}{??}{\deliv@due},
\delivs@legend@nature: \@ifundefined{deliv@nature}{??}{\deliv@nature},
\delivs@legend@dissem: \@ifundefined{deliv@dissem}{??}{\deliv@dissem},
\delivs@legend@lead: \@ifundefined{deliv@lead}{??}{\site{\deliv@lead}})]
 \pdata@target{deliv}{\taskin\deliv@id\wpg@id}{\textit{#2}}
\@ifundefined{deliv@miles}{}{% print the milestones and update their deliverables
\let\m@sep=\relax% do not print the separator the first time round
\lec{\@for\@I:=\deliv@miles\do{% Iterate over the milestones mentioned
\m@sep\pdataRef{mile}{\@I}{label}% print the milestone reference
\let\m@sep=,}}%set the separator for the next times
\def\d@sep{,}
 \@for\@I:=\deliv@miles\do{% Iterate over the milestones mentioned
 \expandafter\ifx\csname\@I delivs\endcsname\relax% Check that the miles@delivs is empty
  {\expandafter\xdef\csname\@I delivs\endcsname{\wpg@id @\deliv@id}}% if so, skip the separator
   \else\expandafter\xdef\csname\@I delivs\endcsname%if not add it
      {\csname\@I delivs\endcsname\d@sep\wpg@id @\deliv@id}\fi}}
```

Now, we only need to instantiate

wadeliv

```
\newenvironment{wadeliv}[2][]{\ifdelivs\wpg@deliv{#1}{#2}{wa}\else\deliv@error\fi}{}
```

wpdeliv

```
\newenvironment{wpdeliv}[2][]{\ifdelivs\wpg@deliv{#1}{#2}{wp}\else\deliv@error\fi}{}
```

\milestone@label

```
\newcommand\milestone@label[1]{M{#1}}
```

\mileref This macro is generally useful to put a comment at the end of the line, possibly making a new one if there is not enough space.

```
\newcommand\mileref[1]{\pdataRef{mile}{#1}{label}}
\newcommand\miletref[1]{\mileref{#1}: \pdataRefFB{mile}{#1}{short}{title}}
```

\milestone create a new milestone, initialize its deliverables accumulator macro, set up hyperlinking, and extend the milestones list.

```
\newcounter{milestone}
\define@key{milestone}{id}{\gdef\mile@id{#1}}
\define@key{milestone}{month}{\gdef\mile@month{#1}}
\newcommand\milestone[3][]{%
\ifdelivs%
\setkeys{milestone}{#1}\stepcounter{milestone}%
\pdata@def{mile}\mile@id{label}{\milestone@label{\themilestone}}%
\pdata@def{mile}\mile@id{month}{\mile@month}%
\pdata@def{mile}\mile@id{title}{#2}%
\pdata@def{mile}\mile@id{description}{#3}%
\@ifundefined{mile@stones}%
{\xdef\mile@stones{\mile@id}}%
{\xdef\mile@stones{\mile@stones,\mile@id}}%
\@milestone{\mile@id}{#2}{#3}% presentation
\else\deliv@error\fi}
```

\@milestone the corresponding presentation macro.

```
\newcommand\@milestone[3]{% id, title, description
\item \textbf{\miles@legend@milestone\xspace\pdata@target{mile}\mile@id{\pdataref{mile}{#1}{label}}
(\miles@legend@month \pdataref{mile}\mile@id{month})
\textbf{#2}} #3}
\newcommand\miles@legend@month{Month}
\newcommand\miles@legend@milestone{Milestone}
```

milestones This does the metadata bookkeeping, the layout is delegated to the presentation environment `@milestones` and the legend macros that can be customized for specific proposals.

```
\newenvironment{milestones}%
{\ifdelivs\begin{@milestones}\else\deliv@error\fi}
{\ifdelivs\pdata@def{all}{mile}{ids}{\mile@stones}%
\pdata@def{all}{mile}{count}{\themilestone}%
\end{@milestones}\fi}
```

@milestones here we do the work.

```
\newenvironment{@milestones}{\begin{enumerate}}{\end{enumerate}}
```

\deliverable the first argument is an extended due date to facilitate sorting.

```
\newcommand{\deliverable}[9]{\pdataRef{deliv}{#4}{label}&#7&#8&#9&#6&#5&#2\\\hline}%sortkey,due,label,id,titl
```

deliverables

```
\newenvironment{deliverables}[1]{\ifdelivs\begin{longtable}{|l|p{#1}|l|l|l|l|l|}\hline%
\#&\textbf{\delivs@legend@name}&%
\textbf{\delivs@legend@wp}&%
\textbf{\delivs@legend@lead}&%
\textbf{\delivs@legend@nature}&%
\textbf{\delivs@legend@level}&%
\textbf{\delivs@legend@due}\\\hline\hline%
\endhead%
\else\deliv@error\fi}
{\ifdelivs\end{longtable}\fi}
```

now the multilingual support

```
\newcommand\delivs@legend@name{Deliverable name}
\newcommand\delivs@legend@wp{WP}
\newcommand\delivs@legend@nature{Type}
\newcommand\delivs@legend@level{Level}
\newcommand\delivs@legend@due{Due}
\newcommand\delivs@legend@dissem{Dissem.}
\newcommand\delivs@legend@lead{Lead}
```

\inputdelivs

```
\newcommand{\inputdelivs}[1]{%
\begin{deliverables}{#1}%
\IfFileExists{\jobname.deliverables}%
{\input{\jobname.deliverables}}%
{\IfFileExists{\jobname.delivs}{\input{\jobname.delivs}}{}}
\end{deliverables}}
```

⟨/sty⟩

4.10 Project Data, Referencing & Hyperlinking

\pdata@* `\pdata@out` is the file handle for the project data file, we define internal macros to open and close it.

```
⟨*pdata⟩
\newif\ifwork@areas\work@areastrue
\DeclareOption{noworkareas}{\work@areasfalse}
\ProcessOptions
\RequirePackage{xspace}
\newwrite\pdata@out
\newcommand\pdata@open[1]{\immediate\openout\pdata@out=#1.pdata}
\newcommand\pdata@close{\closeout\pdata@out}
```

\readpdata This macro reads the project data file and its error handling

```
\newcommand\readpdata[1]{\IfFileExists{#1.pdata}
{\message{proposal: Reading Project Data}\makeatletter\input{#1.pdata}\makeatother}
{proposal: No Project Data found, (forward) references may be compromized}}
```

\pdata@target This internal macro makes a hyper-target: `\pdata@target{`⟨*cat*⟩`}{`⟨*id*⟩`}{`⟨*label*⟩`}` prints ⟨*label*⟩ with a target name ⟨*cat*⟩`@`⟨*id*⟩`@target` attached to it.

```
\newcommand\pdata@target[3]{\hypertarget{#1@#2@target}{#3}}
```

\pdata@def This macro writes an `\@pdata@def` command to the current aux file and also executes it.

```
\newcommand\pdata@def[4]{%\@pdata@def{#1}{#2}{#3}{#4}%
  \protected@write\pdata@out{}{\string\@pdata@def{#1}{#2}{#3}{#4}}}
```

\@pdata@def This macro stores the value of its last argument in a custom macro for reference.

```
\newcommand\@pdata@def[4]{\expandafter\gdef\csname #1@#2@#3\endcsname{#4}}
```

\pdataref

```
\newcommand\pdataref[3]{\@ifundefined{#1@#2@#3}%
                {\protect\G@refundefinedtrue\@latex@warning{#3 for #1 #2 undefined}??}%
                 {\csname #1@#2@#3\endcsname}}%
\newcommand\pdataref@aux[3]{\@ifundefined{#1@#2@#3}{??}{\csname #1@#2@#3\endcsname}}%
\newcommand\pdataref@num[3]{\@ifundefined{#1@#2@#3}{0}{\csname #1@#2@#3\endcsname}}%
\newcommand\pdataref@safe[3]{\@ifundefined{#1@#2@#3}{}{\csname #1@#2@#3\endcsname}}%
```

\pdatarefFB a variant with fallback field,

```
\newcommand\pdatarefFB[4]{\@ifundefined{#1@#2@#3}%
{\@ifundefined{#1@#2@#4}%
{\protect\G@refundefinedtrue\@latex@warning{both #3 and its fallback #4 undefined for #1 #2}??}%
{\csname #1@#2@#4\endcsname}}
{\csname #1@#2@#3\endcsname}}
```

\pdataRef

```
\newcommand\pdataRef[3]{\@ifundefined{#1@#2@#3}%
{\protect\G@refundefinedtrue\@latex@warning{#3 for #1 #2 undefined}??}%
{\hyperlink{#1@#2@target}{\csname #1@#2@#3\endcsname}}}
```

\pdataRefFB a variant with fallback field,

```
\newcommand\pdataRefFB[4]{\@ifundefined{#1@#2@#3}%
{\@ifundefined{#1@#2@#4}%
{\protect\G@refundefinedtrue\@latex@warning{both #3 and its fallback #4 undefined for #1 #2}??}%
{\hyperlink{#1@#2@target}{\csname #1@#2@#4\endcsname}}}
{\hyperlink{#1@#2@target}{\csname #1@#2@#3\endcsname}}}
```

\pdatacount

```
\newcommand\prop@count[1]{\ifcase #1 zero\or one\or two\or three\or four\or five\or six\or seven \or
  eight\or nine\or ten\or eleven \or twelve\else#1\fi}
\newcommand\pdatacount[2]{\prop@count{\pdataref@num{#1}{#2}{count}}}
```

\pn*

```
\newcommand\pn{\pdataref{prop}{gen}{acronym}\xspace}
\newcommand\pnlong{\pdataref{prop}{gen}{acrolong}\xspace}
```

\W*ref

```
\newcommand\WPref[1]{\pdataRef{wp}{#1}{label}}
\newcommand\WPtref[1]{\WPref{#1}: \pdataRefFB{wp}{#1}{short}{title}}
\ifwork@areas
\newcommand\WAref[1]{\pdataRef{wa}{#1}{label}}
\newcommand\WAtref[1]{\WAref{#1}: \pdataRefFB{wa}{#1}{short}{title}}
\fi
```

⟨/pdata⟩

4.11 The Work Package Table

EdN:7 `\wp@style` These macros[7] determine the styling of cells in the work package table. That can be tweaked by redefining them.

```
700 ⟨*sty⟩
701 \definecolorset{gray/rgb/hsb/cmyk}{}{}%
702 {leadgray,.90/.90,.90,.90/0,0,.90/0,0,0,.10;%
703 wagray,.70/.70,.70,.70/0,0,.70/0,0,0,.30;%
704 ganttgray,.60/.60,.60,.60/0,0,.60/0,0,0,.40}
705 \newcommand\sum@style[1]{\cellcolor{wagray}{\textbf{#1}}}
706 \newcommand\wa@style[1]{\cellcolor{wagray}{\textbf{#1}}}
707 \newcommand\wp@style[1]{#1}
708 \newcommand\lead@style[1]{\cellcolor{leadgray}{\textit{#1}}}
709 \newcommand\wp@lead@style@explained{light gray italicised}
```

`\wpfigstyle`

```
710 \def\wpfig@style{}
711 \newcommand\wpfigstyle[1]{\def\wpfig@style{#1}}
```

We first define the options for the `\wpfig` macro, they specify what columns we have in the table.

```
712 \newcounter{wpfig@options}
713 \define@key{wpfig}{size}{\def\wpfig@size{#1}\@dmp{size=#1}}
714 \def\@true{true}
715 \def\wpfig@pages{false}
716 \define@key{wpfig}{pages}[true]{\def\wpfig@pages{#1}\stepcounter{wpfig@options}}
717 \def\wpfig@type{false}
718 \define@key{wpfig}{type}[true]{\def\wpfig@type{#1}\stepcounter{wpfig@options}}
719 \def\wpfig@start{false}
720 \define@key{wpfig}{start}[true]{\def\wpfig@start{#1}\stepcounter{wpfig@options}}
721 \def\wpfig@length{false}
722 \define@key{wpfig}{length}[true]{\def\wpfig@length{#1}\stepcounter{wpfig@options}}
723 \def\wpfig@end{false}
724 \define@key{wpfig}{end}[true]{\def\wpfig@end{#1}\stepcounter{wpfig@options}}
725 \define@key{wpfig}{label}{\def\wpfig@label{#1}}
726 \define@key{wpfig}{caption}{\def\wpfig@caption{#1}}
```

`wp@figure` This environment makes legend for the table (but not the contents) for the `\wpfig` macro. The main work achieved here is to generate the head line (sideways) and the footer in the various cases
EdN:8 given by the package options.[8] Depending on the various class and `wpfig` options, we make header and footer line for the table.

```
727 \def\@sw#1{\begin{sideways}#1\end{sideways}}
728 \newenvironment{wp@figure}{\begin{table}[ht]\wpfig@style\begin{center}
729 {\let\@sw\relax\let\textbf\relax\let\site\relax\let\pn\relax\let\sys\relax%
730 \gdef\wpfig@headline{\wpfig@legend@wap&\wpfig@legend@title%
731 \ifx\wpfig@type\@true&\wpfig@legend@type\fi%
732 \ifx\wpfig@pages\@true&\@sw{\wpfig@legend@page}\fi%
733 \ifx\wpfig@start\@true&\@sw{\wpfig@legend@start}\fi%
734 \ifx\wpfig@length\@true&\@sw{\wpfig@legend@length}\fi
735 \ifx\wpfig@end\@true&\@sw{\wpfig@legend@end}\fi}%
736 \if@sites%
737 \@for\@site:=\prop@gen@sites\do{%
738 \xdef\wpfig@headline{\wpfig@headline&\@sw{\wpfig@legend@siteRM{\@site}}}%
739 \if@RAM\xdef\wpfig@headline{\wpfig@headline&\@sw{\wpfig@legend@siteRAM{\@site}}}\fi}%
740 \xdef\wpfig@headline{\wpfig@headline&\@sw{\wpfig@legend@totalRM}}%
```

[7] EdNote: maybe add "wpfig" in the name to show dependency
[8] EdNote: this is a bit of misnomer, it does not do the figure bit.

```
\if@RAM\xdef\wpfig@headline{\wpfig@headline&\@sw{\wpfig@legend@totalRAM}}\fi%
\else% if@sites
\xdef\wpfig@headline{\wpfig@headline &\@sw{\wpfig@legend@RM}\if@RAM&\@sw{\wpfig@legend@RAM}\fi}
\fi}%if@sites
\if@RAM\begin{tabular}{|l|l|*{\thewpfig@options}{r|}*{\the@sites}{r|r|}|r|r|}\hline
\else\begin{tabular}{|l|l|*{\thewpfig@options}{r|}|*{\the@sites}{r|}|r|}\hline\fi%|
\wpfig@headline\\\hline\hline}
{\end{tabular}\smallskip\\
\wpfig@legend@RAM@expl\if@sites; \wpfig@legend@lead@expl\fi
\@ifundefined{wpfig@label}{\caption{\wpfig@legend@caption}}{\caption{\wpfig@caption}}
\@ifundefined{wpfig@label}{\label{fig:wplist}}{\label{\wpfig@label}}
\end{center}\end{table}}
```

and now multilinguality support

```
\newcommand\wpfig@legend@wap{\textbf{\ifwork@areas{WA/P}\else{WP}\fi}}
\newcommand\wpfig@legend@title{\textbf{Title}}
\newcommand\wpfig@legend@type{\textbf{type}}
\newcommand\wpfig@legend@page{\textbf{page}}
\newcommand\wpfig@legend@start{\textbf{start}}
\newcommand\wpfig@legend@length{\textbf{length}}
\newcommand\wpfig@legend@end{\textbf{end}}
\newcommand\wpfig@legend@siteRM[1]{\site{#1}\if@RAM\ RM\fi}
\newcommand\wpfig@legend@siteRAM[1]{\site{#1}\ RAM}
\newcommand\wpfig@legend@totalRM{total\if@RAM\ RM\fi}
\newcommand\wpfig@legend@totalRAM{total RAM}
\newcommand\wpfig@legend@RM{RM}
\newcommand\wpfig@legend@RAM{RAM}
\newcommand\wpfig@legend@RAM@expl{\if@RAM R(A)M $\widehat=$ Researcher (Assistant) Months\else\ Efforts in PM
\newcommand\wpfig@legend@lead@expl{WP lead efforts \wp@lead@style@explained}
\newcommand\wpfig@legend@caption{{\ifwork@areas Work Areas and \fi}Work Packages}
```

EdN:9\wpfig [9]

```
\newcount\local@count
\newcount\@@@RM\if@RAM\newcount\@@@RAM\fi
\newcount\all@@@RM\if@RAM\newcount\all@@@RAM\fi
\newcommand{\wpfig}[1][]{\setcounter{wpfig@options}{0}\setkeys{wpfig}{#1}
```

the first thing to do is to build the body of the table programmatically by (globally) extending the \@wp@lines token register inside a bracket group which locally redefines all macros we are using in the extensions, so that they do not get into the way. We start this group now.

```
{\gdef\@wp@lines{}%initialize
\let\tabularnewline\relax\let\hline\relax\let\lead@style\relax% so they
\let\wa@style\relax\let\wp@style\relax \let\@sw\relax\let\textbf\relax% do not
\let\G@refundefinedtrue=\relax\let\@latex@warning=\relax\let\hyperlink=\relax% bother
\let\pn\relax\let\xspace\relax% us
```

The code that follows now, could be more elegant, if we had a better way of organizing the data, but this works for now, we have four cases: with/without work areas and with/without sites. All do something very similar.

```
\ifwork@areas
\edef\@@was{\pdataref@safe{all}{wa}{ids}}%
\@for\@@wa:=\@@was\do{% iterate over the work areas
\xdef\@@wa@line{\wa@style{\pdataRef{wa}\@@wa{label}}%
&\wa@style{\@ifundefined{wa@\@@wa @short}{\pdataref{wa}\@@wa{title}}{\pdataref{wa}\@@wa{short}}}%
\ifx\wpfig@type\@true&\wa@style{\pdataref{wa}\@@wa{type}}\fi%
\ifx\wpfig@pages\@true&\wa@style{\pdataref{wa}\@@wa{page}}\fi%
\ifx\wpfig@start\@true&\wa@style{\pdataref{wa}\@@wa{start}}\fi%
```

[9] EdNote: The computation can be distributed much more efficiently (by intermingling the counter advances with the row creation), but this works now

```
\ifx\wpfig@length\@true&\wa@style{\pdataref{wa}\@@wa{len}}\fi%
\ifx\wpfig@end\@true&\wa@style{\pdataref{wa}\@@wa{end}}\fi}
\if@sites
\@for\@site:=\prop@gen@sites\do{%
\edef\@@wps{\pdataref@safe\@@wa{wp}{ids}}%
\local@count 0%
\@for\@@wp:=\@@wps\do{\advance\local@count by \pdataref@num\@@wp\@site{RM}}%
\pdata@def\@@wa\@site{RM}{\the\local@count}%
\xdef\@@wa@line{\@@wa@line&\wa@style{\the\local@count}}%
\if@RAM
\local@count 0%
\@for\@@wp:=\@@wps\do{\advance\local@count by \pdataref@num\@@wp\@site{RAM}}
\pdata@def\@@wa\@site{RAM}{\the\local@count}%
\xdef\@@wa@line{\@@wa@line&\wa@style{\the\local@count}}%
\fi}
\local@count0\relax%
\@for\@site:=\prop@gen@sites\do{\global\advance\local@count by \pdataref@num\@@wa\@site{RM}}%
\xdef\@@wa@line{\@@wa@line &\wa@style{\textbf{\the\local@count}}}
\if@RAM
\local@count0\relax%
\@for\@site:=\prop@gen@sites\do{\global\advance\local@count by \pdataref@num\@@wa\@site{RAM}}%
\xdef\@@wa@line{\@@wa@line &\wa@style{\textbf{\the\local@count}}}
\fi
\else% if@sites
\edef\@@wps{\pdataref@safe{all}{wp}{ids}}%
\xdef\@@wa@line{\@@wa@line&\wa@style{\pdataref{wa}\@@wa{RM}}
\if@RAM&\wa@style{\pdataref{wa}\@@wa{RAM}}\fi}%
\fi% if@sites
\xdef\@wp@lines{\@wp@lines\@@wa@line\tabularnewline\hline}% add the line for the workarea
\edef\@@wps{\pdataref@safe\@@wa{wp}{ids}}%
\@for\@@wp:=\@@wps\do{% iterate over its work packages
\xdef\@@wp@line{\pdataRef{wp}\@@wp{label}%
&\@ifundefined{wp@\@@wp @short}{\pdataref{wp}\@@wp{title}}{\pdataref{wp}\@@wp{short}}%
\ifx\wpfig@type\@true&\pdataref{wp}\@@wp{type}\fi%
\ifx\wpfig@pages\@true&\pdataref{wp}\@@wp{page}\fi%
\ifx\wpfig@start\@true&\pdataref{wp}\@@wp{start}\fi%
\ifx\wpfig@length\@true&\pdataref{wp}\@@wp{len}\fi%
\ifx\wpfig@end\@true&\pdataref{wp}\@@wp{end}\fi}
\if@sites
\@for\@site:=\prop@gen@sites\do{%
\edef\@@lead{\pdataref@safe{wp}\@@wp{lead}}
\edef\@@RM{\ifx\@@lead\@site\lead@style{\pdataref@safe\@@wp\@site{RM}}\else\wp@style{\pdataref@safe\@@wp\@sit
\xdef\@@wp@line{\@@wp@line&\@@RM}
\if@RAM
\edef\@@RAM{\ifx\@@lead\@site\lead@style{\pdataref@safe\@@wp\@site{RAM}}\else\wp@style{\pdataref@safe\@@wp\@s
\xdef\@@wp@line{\@@wp@line&\@@RAM}
\fi}
\local@count0\relax%
\@for\@site:=\prop@gen@sites\do{\global\advance\local@count by \pdataref@num\@@wp\@site{RM}}%
\xdef\@@wp@line{\@@wp@line &\textbf{\the\local@count}}
\if@RAM
\global\local@count0\relax%
\@for\@site:=\prop@gen@sites\do{\global\advance\local@count by \pdataref@num\@@wp\@site{RAM}}%
\xdef\@@wp@line{\@@wp@line &\textbf{\the\local@count}}
\fi% if@RAM
\else% if@sites
\xdef\@@wp@line{\@@wp@line&\wp@style{\pdataref@safe{wp}\@@wp{RM}}}
\if@RAM\xdef\@@wp@line{\@@wp@line&\wp@style{\pdataref@safe{wp}\@@wp{RAM}}}\fi
```

```
\fi% if@sites
\xdef\@wp@lines{\@wp@lines\@@wp@line\tabularnewline\hline}}}
```

Now the case where we do not have work areas.

```
\else% ifwork@areas
\edef\@@wps{\pdataref@safe{all}{wp}{ids}}%
\@for\@@wp:=\@@wps\do{% iterate over its work packages
\xdef\@@wp@line{\pdataRef{wp}\@@wp{label}%
&\@ifundefined{wp@\@@wp @short}{\pdataref{wp}\@@wp{title}}{\pdataref{wp}\@@wp{short}}
\ifx\wpfig@type\@true&\pdataref{wp}\@@wp{type}\fi%
\ifx\wpfig@pages\@true&\pdataref{wp}\@@wp{page}\fi%
\ifx\wpfig@start\@true&\pdataref{wp}\@@wp{start}\fi%
\ifx\wpfig@length\@true&\pdataref{wp}\@@wp{len}\fi%
\ifx\wpfig@end\@true&\pdataref{wp}\@@wp{end}\fi}
\if@sites
\@for\@site:=\prop@gen@sites\do{%
\edef\@@lead{\pdataref@safe{wp}\@@wp{lead}}
\edef\@@RM{\ifx\@@lead\@site\lead@style{\pdataref@safe\@@wp\@site{RM}}\else\wp@style{\pdataref@safe\@@wp\@sit
\xdef\@@wp@line{\@@wp@line&\@@RM}
\if@RAM
\edef\@@RAM{\ifx\@@lead\@site\lead@style{\pdataref@safe\@@wp\@site{RAM}}\else\wp@style{\pdataref@safe\@@wp\@s
\xdef\@@wp@line{\@@wp@line&\wp@style\@@RAM}
\fi}
\global\local@count0\relax%
\@for\@site:=\prop@gen@sites\do{\global\advance\local@count by \pdataref@num\@@wp\@site{RM}}%
\xdef\@@wp@line{\@@wp@line &\textbf{\the\local@count}}
\if@RAM
\global\local@count0\relax%
\@for\@site:=\prop@gen@sites\do{\global\advance\local@count by \pdataref@num{#1}\@site{RAM}}%
\xdef\@@wp@line{\@@wp@line &\textbf{\the\local@count}}
\fi
\else% if@sites
\xdef\@@wp@line{\@@wp@line&\wp@style{\pdataref@safe{wp}\@@wp{RM}}}
\if@RAM\xdef\@@wp@line{\@@wp@line&\wp@style{\pdataref@safe{wp}\@@wp{RAM}}\fi}
\fi% if@sites
\xdef\@wp@lines{\@wp@lines\@@wp@line\tabularnewline\hline}}
\fi%ifwork@areas
```

Now we compute the totals lines in the `\@totals` macros; again there are four cases to consider

```
\gdef\@totals{}
\ifwork@areas
\if@sites
\@for\@site:=\prop@gen@sites\do{% iterate over the sites
\@@@RM=0\if@RAM\@@@RAM=0\fi
\edef\@@was{\pdataref@safe{all}{wa}{ids}}%
\@for\@@wa:=\@@was\do{% iterate over the work areas
\edef\@@wps{\pdataref@safe\@@wa{wp}{ids}}%
\@for\@@wp:=\@@wps\do{% iterate over the work packages
\advance\@@@RM by \pdataref@num\@@wp\@site{RM}%
\if@RAM\advance\@@@RAM by \pdataref@num\@@wp\@site{RAM}\fi}}
\pdata@def{all}\@site{RM}{\the\@@@RM}\if@RAM\pdata@def{all}\@site{RAM}{\the\@@@RAM}\fi
\advance\all@@@RM by \the\@@@RM\if@RAM\advance\all@@@RAM by \the\@@@RAM\fi
\xdef\@totals{\@totals & \textbf{\the\@@@RM}\if@RAM& \textbf{\the\@@@RAM}\fi}}
\xdef\@totals{\@totals & \textbf{\the\all@@@RM}\if@RAM&\textbf{\the\all@@@RAM}\fi}
\pdata@def{all}{total}{RM}{\the\all@@@RM}\if@RAM\pdata@def{all}{total}{RAM}{\the\all@@@RAM}\fi
\else% if@sites
\@@@RM=0\if@RAM\@@@RAM=0\fi
\edef\@@was{\pdataref@safe{all}{wa}{ids}}%
\@for\@@wa:=\@@was\do{\edef\@@wps{\pdataref@safe\@@wa{wp}{ids}}%
```

```
\@for\@@wp:=\@@wps\do{% iterate over the work packages
\advance\@@@RM by \pdataref@num{wp}\@@wp{RM}%
\if@RAM\advance\@@@RAM by \pdataref@num{wp}\@@wp{RAM}\fi}}
\pdata@def{all}{total}{RM}{\the\@@@RM}\if@RAM\pdata@def{all}{total}{RAM}{\the\@@@RAM}\fi
\xdef\@totals{&\the\@@@RM\if@RAM &\the\@@@RAM\fi}
\fi% if@sites
\else%i.e. no work@areas
\if@sites
\@for\@site:=\prop@gen@sites\do{%iterate over the sites
\@@@RM=0\if@RAM\@@@RAM=0\fi%
\edef\@@wps{\pdataref@safe{all}{wp}{ids}}%
\@for\@@wp:=\@@wps\do{% iterate over the work packages
\advance\@@@RM by \pdataref@num\@@wp\@site{RM}%
\if@RAM\advance\@@@RAM by \pdataref@num\@@wp\@site{RAM}\fi}
\pdata@def{all}\@site{RM}{\the\@@@RM}\if@RAM\pdata@def{all}\@site{RAM}{\the\@@@RAM}\fi
\xdef\@totals{\@totals & \textbf{\the\@@@RM}\if@RAM& \textbf{\the\@@@RAM}\fi}
\advance\all@@@RM by \the\@@@RM\if@RAM\advance\all@@@RAM by \the\@@@RAM\fi}
\xdef\@totals{\@totals &\textbf{\the\all@@@RM}\if@RAM&\textbf{\the\all@@@RAM}\fi}
\pdata@def{all}{total}{RM}{\the\all@@@RM}\if@RAM\pdata@def{all}{total}{RAM}{\the\all@@@RAM}\fi
\else% if@sites
\@@@RM=0\if@RAM\@@@RAM=0\fi
\edef\@@wps{\pdataref@safe{all}{wp}{ids}}%
\@for\@@wp:=\@@wps\do{% iterate over the work packages
\advance\@@@RM by \pdataref@num{wp}\@@wp{RM}%
\if@RAM\advance\@@@RAM by \pdataref@num{wp}\@@wp{RAM}\fi}
\pdata@def{all}{total}{RM}{\the\@@@RM}\if@RAM\pdata@def{all}{total}{RAM}{\the\@@@RAM}\fi
\xdef\@totals{&\the\@@@RM\if@RAM &\the\@@@RAM\fi}
\fi% if@sites
\fi
```

And we finally have a line for the intended totals which we use in draft mode.

```
\gdef\intended@totals{}\gdef\requested@totals{}
\if@sites
\@for\@site:=\prop@gen@sites\do{
\xdef\intended@totals{\intended@totals&\textbf{\pdataref@safe{site}\@site{intendedRM}}}
\xdef\requested@totals{\requested@totals&\pdataref@safe{site}\@site{reqPM}}
\if@RAM\xdef\intended@totals{\intended@totals&\textbf{\pdataref@safe{site}\@site{intendedRAM}}}\fi}
\if@RAM\xdef\intended@totals{\intended@totals&&}\else%
\xdef\intended@totals{\intended@totals&}%
\xdef\requested@totals{\requested@totals&}%
\fi
\else% if@sites
\xdef\intended@totals{\intended@totals&\textbf{\pdataref@safe{all}{intended}{RM}}}
\if@RAM\xdef\intended@totals{\intended@totals&\textbf{\pdataref@safe{all}{intended}{RAM}}}\fi
\fi}% if@sites
```

finally, we make all of this into a figure, computing the colspan of the the legend cells for the totals via `\local@count` from the optional columns.

```
\local@count\thewpfig@options\advance\local@count by 2
\begin{wp@figure}
\@wp@lines\hline%
\multicolumn{\the\local@count}{|c|}{\prop@legend@totals}\@totals\\\hline%
\ifsubmit\else%
\ifx\prop@gen@topdownPM\@true%
\multicolumn{\the\local@count}{|c|}{\prop@legend@intendedtotals}\intended@totals\\\hline%
\fi% topdownPM
\ifx\prop@gen@botupPM\@true%
\multicolumn{\the\local@count}{|c|}{\prop@legend@requestedtotals}\requested@totals\\\hline%
\fi% botupPM
```

```
\fi% submit
\end{wp@figure}}
```

and now multilinguality support

```
\newcommand\prop@legend@totals{\textbf{totals}}
\newcommand\prop@legend@intendedtotals{\textbf{intended totals}}
\newcommand\prop@legend@requestedtotals{\textbf{requested totals}}
```

4.12 Gantt Charts

Gantt Charts are done with help of the the `tikz` package. The `gantt` environments pick up on the declared duration of the proposal in months stored in the `\prop@gen@months` macro.

We define the keys for Gantt tables

```
\newif\ifgantt@draft\gantt@draftfalse
\newif\ifgantt@miles\gantt@milesfalse
\define@key{gantt}{xscale}{\def\gantt@xscale{#1}}
\define@key{gantt}{yscale}{\def\gantt@yscale{#1}}
\define@key{gantt}{step}{\def\gantt@step{#1}}
\define@key{gantt}{size}{\def\gantt@size{#1}}
\define@key{gantt}{draft}[true]{\ifsubmit\else\gantt@drafttrue\fi}
\define@key{gantt}{milestones}[true]{\gantt@milestrue}
```

Then we define an auxiliary function that provides defaults for these keys and sets the internal macros.

```
\def\gantt@set#1{\gantt@draftfalse\def\gantt@xscale{1}\def\gantt@yscale{.35}\def\gantt@step{3}
\setkeys{gantt}{#1}}
```

Finally, the Gantt Chart environment itself.

gantt The `gantt[`⟨*keyvals*⟩`]{`⟨*height*⟩`}` environment sets up the grid and legend for a gantt chart. The grid is `\prop@gen@months` wide and ⟨*height*⟩ high.

```
\newenvironment{gantt}[2][]
{\gantt@set{#1}\gdef\gantt@height{#2}
\def\@test{\prop@gen@months@default}
\ifx\@test\prop@gen@months
\ClassError{proposal}{Need overall project months to draw gantt
    chart - expect trouble;\MessageBreak specify
    \protect\begin{proposal}[...,months=??,...] to fix}\fi
\@ifundefined{gantt@size}{}{\csname\gantt@size\endcsname}
\newdimen\gantt@ymonths
\gantt@ymonths=\gantt@height cm
\advance\gantt@ymonths by .8cm
\begin{tikzpicture}[xscale=\gantt@xscale,yscale=\gantt@yscale]}
{\draw[xstep=\gantt@step,very thin] (0,0) grid (\prop@gen@months,\gantt@height);
\foreach \x in {0,\gantt@step,...,\prop@gen@months} \node at (\x,\gantt@ymonths) {\x};
\ifgantt@miles
\newdimen\gantt@ymiles\gantt@ymiles=\gantt@height cm
\advance\gantt@ymiles by 2cm
\newdimen\gantt@ymiles@top\gantt@ymiles@top=\gantt@height cm
%\advance\gantt@ymiles@top by 2cm
\edef\@@miles{\pdataref@safe{all}{mile}{ids}}
\@for\@I:=\@@miles\do{%
\edef\@@month{\pdataref@safe{mile}{\@I}{month}}
\draw[very thick,blue] (\@@month,\gantt@ymiles@top) -- (\@@month,0);
\node[blue] at (\@@month,\gantt@ymiles) {\pdataref{mile}{\@I}{label}};}
\fi %gantt@miles
\end{tikzpicture}}
```

\@action In this we have used the macro that does the actual painting. \@action{⟨*name*⟩}{⟨*line*⟩}{⟨*start*⟩}{⟨*len*⟩}{⟨*force*⟩} creates a gantt node with name ⟨*name*⟩ in line ⟨*line*⟩ starting at month ⟨*month*⟩ with length ⟨*len*⟩ that is ⟨*force*⟩ thick.

```
\newdimen\gantt@ymid\newdimen\gantt@yinc\newdimen\gantt@xend
\newcommand{\@action}[6][]{\def\@test{#1}%
\ifx\@test\@empty\def\@@color{ganttgray}\else\def\@@color{#1}\fi
\gantt@ymid=#3 cm\gantt@yinc=\gantt@yscale cm
\gantt@xend=#4 cm\advance\gantt@xend by #5 cm
\advance\gantt@ymid by \gantt@yinc
\fill[\@@color] (#4,#3) rectangle +(#5,#6);
\node (#2@left) at (#4,\gantt@ymid) {};
\node (#2@right) at (\gantt@xend,\gantt@ymid) {};}
```

\@dependency

```
\def\@dependency#1#2{\draw[->,line width=2pt,color=red] (#1@right) -- (#2@left);}
```

tt@compute@effort A helper function that updates the dimension \gantt@effort according to whether the counter \gantt@month is in the range. It is used in \gantt@chart

```
\newcommand\gantt@compute@effort[3]{% start, len, force
  \@@e=#1\advance\@@e by #2
  \ifnum\thegantt@month<#1\else
  \ifnum\thegantt@month<\@@e
  \gantt@plus=#3cm\advance\gantt@effort by \gantt@plus\fi\fi}
```

\ganttchart This macro iterates over the work areas, their work packages, and finally their work phases to use the internal macro \@action. All of this in the gantt setting.

```
\newcommand{\ganttchart}[1][]{\begin{figure}[ht]\centering
\gantt@set{#1}
\def\gantt@wps{\pdataref@num{all}{wp}{count}}
\begin{gantt}[#1]{\gantt@wps}
 \newcounter{taskwps}\newcount\@@line
 \edef\@@was{\pdataref@safe{all}{wa}{ids}}
 \ifwork@areas
 \@for\@@wa:=\@@was\do{% iterate over work areas
   \edef\@@wps{\pdataref@safe\@@wa{wp}{ids}}
   \@for\@@wp:=\@@wps\do{% iterate over work packages
     \stepcounter{taskwps}
     \@@line=\gantt@wps\advance\@@line by -\thetaskwps
     \edef\@@tasks{\pdataref@safe\@@wp{task}{ids}}
     \node at (-1/\gantt@xscale,\@@line) [above=-2pt] {\pdataRef{wp}\@@wp{label}};
     \edef\@@wphases{\pdataref@safe{wp}\@@wp{wphases}}
     \@for\@@ft:=\@@wphases\do{%wp-level work phases
       \decode@wphase\@@ft
       \@action\@@wp\@@line\wphase@start\wphase@len\wphase@force}
     \@for\@@task:=\@@tasks\do{% tasks
       \edef\@@wphases{\pdataref@safe{task}\@@task{wphases}}
       \@for\@@ft:=\@@wphases\do{%task-level work phases
         \decode@wphase\@@ft
         \@action\@@task\@@line\wphase@start\wphase@len\wphase@force}}}}
 \else% ifwork@areas false
 \edef\@@wps{\pdataref@safe{all}{wp}{ids}}
 \@for\@@wp:=\@@wps\do{% iterate over work packages
   \stepcounter{taskwps}
   \@@line=\gantt@wps\advance\@@line by -\thetaskwps
   \edef\@@tasks{\pdataref@safe\@@wp{task}{ids}}
   \node at (-1/\gantt@xscale,\@@line) [above=-2pt] {\pdataRef{wp}\@@wp{label}};
   \edef\@@wphases{\pdataref@safe{wp}\@@wp{wphases}}
   \@for\@@ft:=\@@wphases\do{%iterate over the wp-level work phases
```

```
    \decode@wphase\@@ft
    \@action\@@wp\@@line\wphase@start\wphase@len\wphase@force}
  \@for\@@task:=\@@tasks\do{% task-level work phases
    \edef\@@wphases{\pdataref@safe{task}\@@task{wphases}}
    \@for\@@ft:=\@@wphases\do{%iterate over the task-level work phases
      \decode@wphase\@@ft
      \@action\@@task\@@line\wphase@start\wphase@len\wphase@force}}}
\fi% ifwork@areas end
\edef\@@deps{\pdataref@safe{all}{task}{deps}}
\@for\@@dep:=\@@deps\do{%
  \@dependency{\pdataref@safe{taskdep}\@@dep{from}}{\pdataref@safe{taskdep}\@@dep{to}}}
```

The next piece of code generates the effort sum table in draft mode

```
\ifgantt@draft
   \newcounter{gantt@month}
   \newcount\@@e\newdimen\gantt@effort\newdimen\gantt@plus
   \@whilenum\thegantt@month<\prop@gen@months\do{% step over months
     \gantt@effort=0cm
     \ifwork@areas
     \edef\@@was{\pdataref@safe{all}{wa}{ids}}
     \@for\@@wa:=\@@was\do{% iterate over work areas
       \edef\@@wps{\pdataref@safe\@@wa{wp}{ids}}
       \@for\@@wp:=\@@wps\do{% iterate over work packages
         \edef\@@wphases{\pdataref@safe{wp}\@@wp{wphases}}
         \@for\@@ft:=\@@wphases\do{%iterate over the wp-level work phases
           \decode@wphase\@@ft
           \gantt@compute@effort\wphase@start\wphase@len\wphase@force}
         \edef\@@tasks{\pdataref@safe\@@wp{task}{ids}}
         \@for\@@task:=\@@tasks\do{% iterate over tasks
         \edef\@@wphases{\pdataref@safe{task}\@@task{wphases}}
         \@for\@@ft:=\@@wphases\do{%iterate over the wp-level work phases
           \decode@wphase\@@ft
           \gantt@compute@effort\wphase@start\wphase@len\wphase@force}}}}
     \fill[ganttgray]  (\thegantt@month,-5) rectangle +(1,\gantt@effort);
     \else% ifwork@areas
     \edef\@@wps{\pdataref@safe{all}{wp}{ids}}
     \@for\@@wp:=\@@wps\do{% iterate over work packages
         \edef\@@wphases{\pdataref@safe{wp}\@@wp{wphases}}
         \@for\@@ft:=\@@wphases\do{%iterate over the wp-level work phases
           \decode@wphase\@@ft
           \gantt@compute@effort\wphase@start\wphase@len\wphase@force}
         \edef\@@tasks{\pdataref@safe\@@wp{task}{ids}}
         \@for\@@task:=\@@tasks\do{% iterate over tasks
         \edef\@@wphases{\pdataref@safe{task}\@@task{wphases}}
         \@for\@@ft:=\@@wphases\do{%iterate over the wp-level work phases
           \decode@wphase\@@ft
           \gantt@compute@effort\wphase@start\wphase@len\wphase@force}}}
     \fill[ganttgray]  (\thegantt@month,-5) rectangle +(1,\gantt@effort);
     \fi% ifwork@areas
     \stepcounter{gantt@month}}
  \fi% ifgantt@draft
 \end{gantt}
 \caption{\gantt@caption}\label{fig:gantt}
\end{figure}\footnotetext\gantt@footnote}
```

now the multilingual support

```
\newcommand\gantt@caption@main{Gantt Chart: Overview Work Package Activities}
\newcommand\gantt@caption@lower{lower bar shows the overall effort \if@RAM (RM only) \fi per month}
\newcommand\gantt@caption{\gantt@caption@main\ifgantt@draft\xspace
```

```
  -- \gantt@caption@lower\fi}
\newcommand\gantt@footnote{Bars shown at reduced height (e.g. 50\%) indicate reduced
  intensity during  that work phase  (e.g. to 50\%).}
```

\gantttaskchart EdN:10

This macro is a variant of \ganttchart, but it shows the tasks consecutively, as is useful for EU projects[10]

```
\newcommand{\gantttaskchart}[1][]{\begin{figure}[hbtp]\centering\gantt@set{#1}
\newcounter{gantt@all@tasks}%
\setcounter{gantt@all@tasks}{\pdataref@num{all}{task}{count}}
\addtocounter{gantt@all@tasks}{\pdataref@num{all}{wp}{count}}
\begin{gantt}[#1]{\thegantt@all@tasks}
  \newcounter{gantt@tasks}\newcount\@@line
  \edef\@@wps{\pdataref@safe{all}{wp}{ids}}
   \@for\@@wp:=\@@wps\do{% iterate over work packages
     \stepcounter{gantt@tasks}
%     \@action[white]{}\@@line0{48}1
     \edef\@@tasks{\pdataref@safe\@@wp{task}{ids}}
     \@for\@@task:=\@@tasks\do{% iterate over the tasks
       \stepcounter{gantt@tasks}
       \@@line=\thegantt@all@tasks\advance\@@line by -\thegantt@tasks
       \node at (-.5/\gantt@xscale,\@@line) [above=-2pt] {{\footnotesize\taskreflong\@@wp\@@task}};
       \edef\@@wphases{\pdataref@safe{task}\@@task{wphases}}
       \@for\@@ft:=\@@wphases\do{%iterate over the task-level work phases
         \decode@wphase\@@ft
         \@action\@@task\@@line\wphase@start\wphase@len\wphase@force
      }}}% end all iterations
    \end{gantt}
    \caption{\gantt@caption@main{} -- \emph{\gantt@footnote}}\label{fig:gantt}
\end{figure}}
```

4.13 Coherence

\j*

```
\newcommand\jpub{\textcolor{\prop@link@color}{\textbf{\Large{$\star$}}}}
\newcommand\jpro{\textcolor{\prop@link@color}{\textbf{\Large{$\bullet$}}}}
\newcommand\jsoft{\textcolor{\prop@link@color}{\textbf{@}}}
\newcommand\jorga{\textcolor{\prop@link@color}{\textbf{\Large{$\circ$}}}}
\newcommand\jsup{\textcolor{\prop@link@color}{\textbf{\smiley}}}
```

\add@joint

\add@joint{⟨*first*⟩}{⟨*second*⟩}{⟨*sym*⟩} adds ⟨*sym*⟩ to the the \coherence@⟨*first*⟩@⟨*second*⟩ macro for the coherence table.

```
\newcommand\add@joint[3]{\@ifundefined{coherence@#1@#2}%
{\@namedef{coherence@#1@#2}{#3}}%
{\expandafter\g@addto@macro\csname coherence@#1@#2\endcsname{#3}}}
```

\prop@joint

This iterates over a comma-separated list of names and makes the necessary entries into the coherence table.

```
\newcommand\prop@joint[2]{\@for\@first:=#2\do{%
\@for\@second:=#2\do{\ifx\@first\@second\else\add@joint\@first\@second{#1}\fi}}}
```

\joint*

Now, some instances that use these.

```
\newcommand\jointproj[1]{\prop@joint\jpro{#1}}
\newcommand\jointpub[1]{\prop@joint\jpub{#1}}
\newcommand\jointorga[1]{\prop@joint\jorga{#1}}
\newcommand\jointsoft[1]{\prop@joint\jsoft{#1}}
\newcommand\jointsup[1]{\prop@joint\jsup{#1}}
```

[10] EdNote: this should be incorporated with the gantt chart above, but I am currently to scared to do it so close to the deadline

\coherencematrix

```
\newcommand{\coherencematrix}{
{\let\tabularnewline\relax\let\hline\relax\let\site\relax% so they do
 \let\@sw\relax\let\jpub\relax\let\jpro\relax\let\jorga\relax% not bother
 \let\jsoft\relax\let\jsup\relax\let\cellcolor\relax% us
\gdef\@ct@head{}%
\@for\@site:=\prop@gen@sites\do{\xdef\@ct@head{\@ct@head%
&\ifx\cht@swsites\@true\@sw{\site{\@site}}\else\site{\@site}\fi}}%
\gdef\@ct@lines{\@ct@head\tabularnewline\hline\hline} %initialize with head line
\@for\@site:=\prop@gen@sites\do{\xdef\@ct@line{\site{\@site}}%
  \@for\@@site:=\prop@gen@sites\do{%
    \xdef\@ct@line{\@ct@line&\ifx\@site\@@site{\cellcolor{wagray}{}}\fi%
      \@ifundefined{coherence@\@site @\@@site}{}{\@nameuse{coherence@\@site @\@@site}}}}%
  \xdef\@ct@lines{\@ct@lines\@ct@line\tabularnewline\hline}}%
\begin{tabular}{|l||*{\the@site}{c|}}\hline%
\@ct@lines\hline%
joint&\multicolumn{\the@site}{l|}{\jpub $\hat=$ publication, \jpro $\hat=$ project,
       \jorga $\hat=$ organization, \jsoft $\hat=$ software/resource dev,
       \jsup $\hat=$ supervision}\\\hline
\end{tabular}}
```

\coherencetable

```
\define@key{coherencetable}{swsites}[true]{\def\cht@swsites{#1}}
\define@key{coherencetable}{stretch}{\def\cht@stretch{#1}}
\newcommand\coherencetable[1][]{%
\def\cht@swsites{false}%
\def\cht@stretch{1}%
\setkeys{coherencetable}{#1}%
\begin{table}[ht]\centering%
\small\setlength{\tabcolsep}{.5em}%
\renewcommand{\arraystretch}{\cht@stretch}%
\coherencematrix%
\caption{\coherence@caption}\label{tab:collaboration}
\end{table}}
```

now the multilinguality support

```
\newcommand\coherence@caption{Previous Collaboration between {\pn} members}
```

4.14 Relevant Papers & References

We first define a bibLaTeX bibliography heading that does not create headers, we need it somewhere.

```
\defbibheading{empty}{}
```

We define an internal macro that prints a publication list of a given bibTEX entry type and title for convenience. It also adds a `notype=` to the token register `\prop@rl` to deal with the unclassified entries from the list.

```
\newif\if@allpapers\@allpaperstrue
\newcommand\prop@ppl[3][]{\@allpapersfalse\message{ppl processing: #2}%
\printbibliography[heading=subbibliography,type=#2,title=#3#1]%
\@ifundefined{prop@rl}{\xdef\prop@rl{#2}}{\xdef\prop@rl{\prop@rl, #2}}}
```

The following code does not work yet, it would have been nice to be able to just add a key `unclassified` to catch the unclassified ones. I guess we just have to issue a warning instead.

```
\newcommand\prop@prl[1]{\message{unclassified: #1}%
\printbibliography[heading=subbibliography,title=Unclassified,#1]}%
\define@key{paperlist}{unclassified}[true]{\message{unclass: \prop@rl}\prop@prl\prop@rl}
```

with this, we define a couple of keys that generate

```
\define@key{paperlist}{articles}[true]{\prop@ppl{article}{Articles}}
\define@key{paperlist}{chapters}[true]{\prop@ppl{inbook}{Book Chapters}}
\define@key{paperlist}{confpapers}[true]{\prop@ppl[,keyword=conference]{inproceedings}{Conference Papers}}
\define@key{paperlist}{wspapers}[true]{\prop@ppl[,notkeyword=conference]{inproceedings}{Workshop Papers}}
\define@key{paperlist}{theses}[true]{\prop@ppl{thesis}{Theses}}
\define@key{paperlist}{submitted}[true]{\prop@ppl[,keyword=submitted]{unpublished}{Submitted}}
\define@key{paperlist}{books}[true]{\prop@ppl{book}{Monographs}}
\define@key{paperlist}{techreports}[true]{\prop@ppl{techreport}{Technical Reports}}
```

`featured` We introduce a new bibLaTeX category `featured` for those papers that were already mentioned in `\prop@paperlist` and the macros defined from it.

```
\DeclareBibliographyCategory{featured}
```

`\prop@paperlist` `\prop@paperlist{`⟨*keys*⟩`}{`⟨*refs*⟩`}` generates a paper list from a list ⟨*keys*⟩ of bibliography keys. It makes some local adaptions to the appearance of the bibliography, and then adds ⟨*refs*⟩ to the citable papers marks them as `featured`. Then it uses `\printbibliography` to make a bibliography of the cited papers. Note that these are not cited again in the main bibliography[11]

EdN:11

```
\newcommand\prop@paperlist[2][]{%
\let\biboldfont\bibfont%
\renewcommand{\bibfont}{\footnotesize}%
\renewcommand{\baselinestretch}{.9}%
\nocite{#2}\def\do##1{\addtocategory{featured}{##1}}\docsvlist{#2}%
\setkeys{paperlist}{#1}
\@ifundefined{prop@rl}{}{\@latex@warning{some papers are not classified!}}
\if@allpapers\printbibliography[category=featured,heading=empty]\fi%
\let\bibfont\biboldfont}
```

We define the `warnpubs` heading constructor.

```
\def\prop@warnpubs@message{Many of the proposers' publications are online at one of the following URIs:}
\def\prop@warnpubs@title{References}
\defbibheading{warnpubs}{\section*{\prop@warnpubs@title}%
  \@ifundefined{prop@gen@pubspages}
 {\@latex@warning{No publication pages specified;
                  use the pubspage key in the proposal environment!}}
  {\prop@warnpubs@message%
 \@for\@I:=\prop@gen@pubspages\do{\par\noindent\csname\@I\endcsname}}}
```

Finally, we tweak bibLaTeX to not give DOIs and URLS at the same time.

```
\renewbibmacro*{event+venue+date}{}
\renewbibmacro*{doi+eprint+url}{%
  \iftoggle{bbx:doi}
    {\printfield{doi}\iffieldundef{doi}{}{\clearfield{url}}}
    {}%
  \newunit\newblock
  \iftoggle{bbx:eprint}
    {\usebibmacro{eprint}}
    {}%
  \newunit\newblock
  \iftoggle{bbx:url}
    {\usebibmacro{url+urldate}}
    {}}
```

⟨/sty⟩

[11] EdNote: MK: we may want to make this optional controlled by a package option eventually.

4.15 Miscellaneous

\signatures

```
⟨*pdata⟩
\newcommand{\signatures}[1]{\section{#1}
\qquad\number\day. \number\month. \number\year\\[6ex]
\strut\qquad Date\hfill\@for\@p:=\prop@gen@PIs\do{%
\wa@ref3{person}\@p{personaltitle}~\wa@ref3{person}\@p{name}\hfill}}
```

\@dmp The \@dmp macro shows metadata information about the keys in the margin if \keystrue is specified. This is a debugging tool.

```
\def\@dmp#1{\ifkeys\marginpar{#1}\fi}
```

\euro

```
\renewcommand\euro{\officialeuro\xspace}
⟨/pdata⟩
```

References

[Koh16a] Michael Kohlhase. *Editorial Notes for LaTeX*. Self-documenting LaTeX package. Comprehensive TeX Archive Network (CTAN), 2016.

[Koh16b] Michael Kohlhase. *Preparing DFG Proposals and Reports in LaTeX with* `dfgproposal.cls`. Self-documenting LaTeX package. Comprehensive TeX Archive Network (CTAN), 2016. URL: http://mirror.ctan.org/macros/latex/contrib/proposal/dfg/dfgproposal.pdf.

[Koh16c] Michael Kohlhase. *`workaddress.sty`: An Infrastructure for marking up Dublin Core Metadata in LaTeX documents*. Self-documenting LaTeX package. Comprehensive TeX Archive Network (CTAN), 2016. URL: http://mirror.ctan.org/macros/latex/contrib/stex/sty/workaddress/workaddress.pdf.

[Lon] Brent Longborough. *gitinfo2.sty. A package for accessing metadata from the git dvcs*. URL: http://mirrors.ctan.org/macros/latex/contrib/gitinfo2/gitinfo2.pdf (visited on 10/26/2014).