

# Modul:Format TemplateData

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[Vorlage:Nutshell](#) [Vorlage:Lua](#)

**TemplateData** – Module with auxiliary functions for template documentation, especially by TemplateData.

Core functionality is improved presentation on documentation pages.

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## [Vorlage:Anchor Improve template documentation page – MediaWiki disappointing](#)

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For presentation of template depiction in VisualEditor agreement was made to abandon all markup and clickable links, permitting all tooltips in all environments. Basically this is reasonable, albeit tooltips with markup and clickable links are supported as HTML application for decades now and JavaScript is present anyway when VisualEditor is used.

- In consequence it was decided, that also presentation on template documentation views never ever is permitted to contain effective links or markup.
- That involved, that on many template documentation pages two separated parameter documentation tables are needed and required to be maintained simultaneously: One plain text version for VisualEditor, and a useful one for complex circumstances, with links and markup and lists and tables. – BTW, VisualEditor has not only tooltips, but also a static GUI view, where the lack of deepening links in parameter description is painful.

This state is indefensible.

## [Vorlage:Anchor Improved presentation](#)

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In addition to the simple syntax supported by MediaWiki and presented in the VisualEditor, the following features can be added to the JSON code for the template documentation page. They affect the elements classified as *InterfaceText*, but are only useful for description fields.



### Wikilinks (internal format)

- Using double square brackets pages can be linked as common.
- In VisualEditor, only link title is visible, as it is displayed otherwise.

### External links (URL format)

- Open URL are linked as usual by themselves. In VisualEditor they appear as normal text.
- External links enclosed in simple square brackets are displayed normally on the template documentation page. In VisualEditor the title is omitted and the URL is displayed so that the users can c&p it and transfer it to the address field of the browser. There is no other way.

### Apostrophs ' for italic and bold

- They can be used to emphasize on the documentation page and are missing in VisualEditor (regular script).

### HTML entities

- The following entities can be used: `&lt;`; `&gt;`; `&amp;`; `&quot;`; `&nbsp;`; and all numeric formats.

### HTML tags

- HTML tags (and the MediaWiki elements that are not replaced in advance) are removed for the VisualEditor. Otherwise, they remain effective.
- Attributes are often included in `"`, which conflicts with the JSON syntax. It is important to make sure that `'` is used, which can be a problem with template transclusions.

`<noexport> ... </noexport>`

- The enclosed areas are not exported to the VisualEditor.
- More complex wiki syntax and extensive explanations can be restricted to the documentation page.
- Within a *noexport* area, the line structure of the source text is considered. Otherwise everything is running in a single line, as it would also be represented in the VisualEditor.

### Templates

- In particular when the template parameter `JSON=` is used, templates can be distributed anywhere in the JSON code. However, the expanded syntax might collide with the JSON syntax.

### More effects

- According to the state (required, suggested, optional, deprecated) the table rows are highlighted in light blue, white, gray and pale red.
- When sorting by state, this importance is taken into account and not the alphabetical sequence of the keywords.
- Each parameter can be addressed as a jump destination. The fragment is `#templatedata:parameter-name`.
- Missing labels are highlighted as errors.



- A maintenance category is triggered if errors occur.
- If there are no parameters, the element `params: {}` is not required.

## Eliminate disadvantages

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Two aspects were found to be particularly disturbing in 2013–2017:

1. Even if no parameters at all were defined, a table head is always displayed for a table without content. Even more, this is sortable.
  - A reduction was rejected with [Vorlage:Phab](#). A sortable table of the parameters would be always necessary, even if the table has no rows at all and consists only of the header row.
  - This ridiculous statement led to the development of this module in 2016.
2. Even if the context does not permit that default values or even AutoValue specifications will be defined ever, a content-free six-line definition list is output for each individual parameter value.
  - [Vorlage:Phab](#) / [Vorlage:Phab](#) / [Vorlage:Phab](#) / [Vorlage:Phab](#)
  - MediaWiki did not even deign to answer the disastrous documentation page situation.

The general comments show that MediaWiki only regards the presentation of TemplateData specifications in the VisualEditor as important. However, someone has to program and maintain the templates and someone needs to generate the template description and make it manageable beside the functionality in the VisualEditor form, but that is beyond ken.

## General workflow

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- An attempt is made to read the JSON object (string) from passed template parameters.
- If this failed, the source code of the current and the documentation page is searched for `<templatedata>` elements.
- Two representations are obtained from the JSON object input:
  1. A localized version, markup etc. stripped off, in JSON format.
  2. An HTML structure, basically similar to the MediaWiki representation, possibly with table of the parameters, with enhanced features.
- The result of the template is a visible documentation with markup, followed by a hidden `<templatedata>` element. This is done for the export and corresponds to the MediaWiki guidelines.
  - If current page has been identified as documentation page the hidden `<templatedata>` is suppressed, and those pages do not appear separately in [Special:PagesWithProp /templatedata](#).

## [Vorlage:Anchor](#) Functions for templates

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### Details

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#### **f** [Vorlage:Anchor](#)

Improve TemplateData-presentation; used in [Template:Format TemplateData](#)

*Parameters of template transclusion environment (all optional):*

**1**

JSON string or `<templatedata>` object

**JSON**

JSON string

(precedes **1**)

Transition from `<templatedata>` objects with pipe symbols needs special attention:  
Pipes are to be represented as `{{!}}`, on double curly brackets one should be encoded by HTML entity.

**TOC**

1 - Insert table of contents after general purpose descriptions; but before parameter list, if present

**Example**

**lazy**

1 - Presentation only, do not generate an effective data block  
For general method descriptions.

**debug**

1 - developer mode

*Parameters of `#invoke` for particular project adaption (all optional):*

**cat**

Title of a maintenance category on invalid parameter value etc.

**debug**

Development mode, if provided and not equal 0

**docpageCreate**

Pattern for creation of subpage names; `%s/Doku`

**docpageDetect**

Pattern for recognition of subpage names; `/Doku$`

**msgDescMiss**

Localisation: complaint text on missing description

*Returns:* HTML code; and/or error message, probably with `class="error"`

**failsafe Vorlage:Anchor**

Version identification: 2017-11-06

Optional additional parameter 1 - requested minimal version identification

*Returns:* (empty), if minimal version condition not matched

## Examples (test page)

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A [test page](#) illustrates practical use.

## Vorlage:Anchor Functions for Lua modules (API)

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Some functions described above can be used by other modules:



```
local lucky, TemplateData = pcall( require, "Module:Format TemplateData" )
if type( TemplateData ) == "table" then
    TemplateData = TemplateData.TemplateData()
else
    -- failure; TemplateData is the error message
    return "<span class='error'>" .. TemplateData .. "</span>"
end
```

### TemplateData.fail-safe(atleast)

1. atleast  
*optional*  
*nil* or minimal version request

Returns: *string* or *false*

### TemplateData.getPlainJSON(adapt)

Reduce enhanced JSON information to MediaWiki JSON

1. adapt  
*string*, with JSON (enhanced)

Returns: *string*, with JSON (MediaWiki )

### TemplateData.test(adapt, arglist)

Simulation of template functionality

1. adapt  
*table*, #invoke parameters
2. arglist  
*table*, template parameters

Returns: *string*

## Usage

Currently focusing on one template only:

- [Template:Format TemplateData](#)

## Dependencies

- [Module:Plain text](#)
- [Module:TNT](#) (for the [Vorlage:Para](#) parameter)

```
local TemplateData = { serial = "2017-11-06",
                       suite = "TemplateData" }
local plaintext = require("Module:Plain text")
--=[
improve template:TemplateData
]=]
local Config = {
    -- multiple #invoke option names mapped into unique internal fields
    cat          = "strange",
    classNoNumTOC = "suppressTOCnum",
```



```
-- classParams      = "classTable",
cssParams          = "stylesTable",
cssParWrap        = "stylesTabWrap",
debug             = false,
docpageCreate     = "suffix",
docpageDetect     = "subpage",
msgDescMiss      = "solo",
-- classTable      = false,      -- class for params table
loudly           = false,      -- show exported element, etc.
solo             = false,      -- complaint on missing description
strange          = false,      -- title of maintenance category
stylesTable      = false,      -- styles for params table
stylesTabWrap    = false,      -- styles for params table wrapper
subpage          = false,      -- pattern to identify subpage
suffix           = false,      -- subpage creation scheme
suppressTOCnum   = false      -- class for TOC number suppression
}
local Data = {
  div      = false,      -- <div class="mw-templatedata-doc-wrap">
  got      = false,      -- table, initial templatedata object
  heirs    = false,      -- table, params that are inherited
  less     = false,      -- main description missing
  lasting  = false,      -- old syntax encountered
  lazy     = false,      -- doc mode; do not generate effective <templatedata>
  leading  = false,      -- show TOC
  -- low    = false,      -- l= mode
  order    = false,      -- parameter sequence
  params   = false,      -- table, exported parameters
  scream   = false,      -- error messages
  slang    = false,      -- project language code
  slim     = false,      -- JSON reduced to plain
  source   = false,      -- JSON input
  strip    = false,      -- <templatedata> evaluation
  tag      = false,      -- table, exported root element
  title    = false,      -- page
  tree     = false      -- table, rewritten templatedata object
}
local Permit = {
  styles = { required = "border-left: 3px solid black;",
             suggested = "border-left: 3px solid #888;",
             optional = "border-left: 3px solid #ccc",
             deprecated = "border-left: 3px dotted red; background-color: #FF",
             tableheadbg = "background-color: #B3B7FF;" },
  params = { aliases = "table",
             autovalue = "string",
             default = "string table I18N nowiki",
             deprecated = "boolean string",
             description = "string table I18N",
             example = "string table I18N nowiki",
             label = "string table I18N",
             inherits = "string",
             required = "boolean",
             suggested = "boolean",
             suggestedvalues = "table",
             type = "string" },
  root = { description = "string table I18N",
           format = "string",
           maps = "table",
           params = "table",
           paramOrder = "table",
           sets = "table" },
  search = "[{,}%s*(['\\"])%s%%1%s*:%s*%%{"",
  types = { boolean = true,
           content = true,
```



```
        date           = true,
        line           = true,
        number         = true,
        string         = true,
        unknown        = true,
        url            = true,
        ["wiki-file-name"] = true,
        ["wiki-page-name"] = true,
        ["wiki-template-name"] = true,
        ["wiki-user-name"] = true,
        ["unbalanced-wikitext"] = true,
        ["string/line"] = "line",
        ["string/wiki-page-name"] = "wiki-page-name",
        ["string/wiki-user-name"] = "wiki-user-name" }
}

--
-- Generic utility functions
--

local function _ne( value )
    -- Is string not empty?
    -- Parameter:
    --     value -- the value to test
    -- Return:
    --     boolean -- whether `value` is truthy and not the empty string
    return value and value ~= ''
end -- _ne

local function Fault( alert )
    -- Memorize error message
    -- Parameter:
    --     alert -- string, error message
    if Data.scream then
        Data.scream = string.format( "%s *** %s", Data.scream, alert )
    else
        Data.scream = alert
    end
end -- Fault()

local function collapseWhitespace ( a )
    -- Collapses whitespace, HTML style.
    return a:gsub( "%s*\n%s*", " " )
           :gsub( "%s%s+", " " )
end -- collapseWhitespace

-----
--

local function facet( ask, at )
    -- Find physical position of parameter definition in JSON
    -- Parameter:
    --     ask -- string, parameter name
    --     at  -- number, physical position within definition
    -- Returns number, or nil
    local seek = string.format( Permit.search,
                               ask:gsub( "%%", "%%%%" )
                               :gsub( "( [%-.( )+*?^$%[%]] )",
                                     "%%1" ) )

    local i, k = Data.source:find( seek, at )
    local r, slice, source
    while i and not r do
        source = Data.source:sub( k + 1 )
        slice = source:match( "^%s*\"([^\"]+)\s*:" )
    end
end
```

```
        if not slice then
            slice = source:match( "^%s*'([^\']+)'%s*:" )
        end
        if ( slice and Permit.params[ slice ] ) or
            source:match( "^%s*%}" ) then
            r = k
        else
            i, k = Data.source:find( seek, k )
        end
    end -- while i
    return r
end -- facet()

local function getLocalizedText( adapt )
    -- Retrieve localized text from system message
    -- Parameter:
    --     adapt -- string, message ID after "templatedata-"
    -- Returns string, with localized text
    return mw.message.new( "templatedata-" .. adapt ):plain()
end -- getLocalizedText()

local function faculty( adjust )
    -- Test template arg for boolean
    --     adjust -- string or nil
    -- Returns boolean
    local s = type( adjust )
    local r
    if s == "string" then
        r = mw.text.trim( adjust )
        r = ( r ~= "" and r ~= "0" )
    elseif s == "boolean" then
        r = adjust
    else
        r = false
    end
    return r
end -- faculty()

local function failures()
    -- Retrieve error collection and category
    -- Returns string
    local r
    if Data.scream then
        local e = mw.html.create( "span" )
            :addClass( "error" )
            :wikitext( Data.scream )
        r = tostring( e )
        mw.addWarning( ""'"TemplateData"'<br />" .. Data.scream )
        if Config.strange then
            r = string.format( "%s[[category:%s]]",
                r,
                Config.strange )
        end
    else
        r = ""
    end
    return r
end -- failures()
```

```
local function handleNoexportWhitespace( adjust )
-- Reduces runs of spaces, including newlines, to a single space, so the
-- whole string is on one line. <noexport> blocks are left alone, but the
-- <noexport> tags themselves are removed.
--   adjust -- string
-- Returns string, with adjusted text
local r
if adjust:find( "<noexport>", 1, true ) then
  local i = 1
  local j, k = adjust:find( "<noexport>", i, true )
  r = ""
  while j do
    if j > 1 then
      r = r .. collapseWhitespace( adjust:sub( i, j - 1 ) )
    end
    i = k + 1
    j, k = adjust:find( "</noexport>", i, true )
    if j then
      r = r .. adjust:sub( i, j - 1 )
      i = k + 1
      j, k = adjust:find( "<noexport>", i, true )
    else
      Fault( "missing </noexport>" )
    end
  end
  r = r .. adjust:sub( i )
else
  r = collapseWhitespace( adjust )
end
return r
end -- handleNoexportWhitespace()
```

```
local function faraway( alternatives )
-- Retrieve project language version from multilingual text
-- Parameter:
--   alternatives -- table, to be evaluated
-- Returns
--   1 -- string, with best match
--   2 -- table of other versions, if any
local n = 0
local variants = { }
local r1, r2
if not Data.slang then
  Data.slang = mw.language.getContentLanguage():getCode()
end
for k, v in pairs( alternatives ) do
  if type( v ) == "string" then
    v = mw.text.trim( v )
    if v ~= "" then
      variants[ k ] = v
      n = n + 1
    end
  end
end
end -- for k, v
if n > 0 then
  for k, v in pairs( variants ) do
    if v then
      if n == 1 then
        r1 = v
      end
    end
  end
end
```

```
        elseif k:lower() == Data.slang then
            variants[ k ] = nil
            r1 = v
            r2 = variants
            break -- for k, v
        end
    end
end -- for k, v
if not r1 then
    local seek = string.format( "^%s-", Data.slang )
    for k, v in pairs( variants ) do
        if v and k:lower():match( seek ) then
            variants[ k ] = nil
            r1 = v
            r2 = variants
            break -- for k, v
        end
    end
end -- for k, v
if not r1 then
    local others = mw.language.getFallbacksFor( slang )
    table.insert( others, "en" )
    for i = 1, #others do
        seek = others[ i ]
        if variants[ seek ] then
            r1 = variants[ seek ]
            variants[ seek ] = nil
            r2 = variants
            break -- for i
        end
    end
end -- i = 1, #others
end
if not r1 then
    for k, v in pairs( variants ) do
        if v then
            variants[ k ] = nil
            r1 = v
            r2 = variants
            break -- for k, v
        end
    end
end -- for k, v
end
if r2 then
    for k, v in pairs( r2 ) do
        if v then
            local baseCode = k:match( "^%s*(%a?a?a?)-?%a*%s*$" )
            if not baseCode or not mw.language.isKnownLanguageTag( baseCode ) then
                Fault( string.format( "Invalid <code>lang=%s</code>", baseCode ) )
            end
        end
    end
end -- for k, v
end
return r1, r2
end -- faraway()

local function fathers()
    -- Merge params with inherited values
    local n = 0
    local p = Data.params
    local t = Data.tree.params
    local p2, t2
```

```
for k, v in pairs( Data.heirs ) do
    n = n + 1
end -- for k, v
for i = 1, n do
    for k, v in pairs( Data.heirs ) do
        if v and not Data.heirs[ v ] then
            n = n - 1
            t[ k ].inherits = nil
            Data.heirs[ k ] = nil
            p2 = { }
            t2 = { }
            for k2, v2 in pairs( p[ v ] ) do
                p2[ k2 ] = v2
            end -- for k2, v2
            if p[ k ] then
                for k2, v2 in pairs( p[ k ] ) do
                    if type( v2 ) ~= "nil" then
                        p2[ k2 ] = v2
                    end
                end -- for k2, v2
            end
            p[ k ] = p2
            for k2, v2 in pairs( t[ v ] ) do
                t2[ k2 ] = v2
            end -- for k2, v2
            for k2, v2 in pairs( t[ k ] ) do
                if type( v2 ) ~= "nil" then
                    t2[ k2 ] = v2
                end
            end -- for k2, v2
            t[ k ] = t2
        end
    end -- for k, v
end -- i = 1, n
if n > 0 then
    local s
    for k, v in pairs( Data.heirs ) do
        if v then
            if s then
                s = string.format( "%s &#124; %s", s, k )
            else
                s = "Circular inherits: " .. k
            end
        end
    end
    end -- for k, v
    Fault( s )
end
end -- fathers()

local function feasible( about, asked )
    -- Create description head
    -- Parameter:
    --   about -- table, supposed to contain description
    --   asked -- true, if mandatory description
    -- Returns <block>, with head, or nil
    local para = mw.html.create( "div" )
    local plus, r
    if about and about.description then
        if type( about.description ) == "string" then
            para:wikitext( about.description )
        else
            para:wikitext( about.description[ 1 ] )
        end
    end
end
```

```
        plus = mw.html.create( "ul" )
        if not Config.loudly then
            plus:addClass( "templatedata-maintain" )
            :css( "display", "none" )
        end
        for k, v in pairs( about.description[ 2 ] ) do
            plus:node( mw.html.create( "li" )
                :node( mw.html.create( "code" )
                    :wikitext( k ) )
                :node( mw.html.create( "br" ) )
                :wikitext( handleNoexportWhitespace( v ) ) )
            end -- for k, v
        end
    elseif Config.solo and asked then
        para:addClass( "error" )
        :wikitext( Config.solo )
        Data.less = true
    else
        para = false
    end
    if para then
        if plus then
            r = mw.html.create( "div" )
                :node( para )
                :node( plus )

            else
                r = para
            end
        end
    end
    return r
end -- feasible()

local function feat()
    -- Check and store parameter sequence
    if Data.source then
        local i = 0
        local s
        for k, v in pairs( Data.tree.params ) do
            if i == 0 then
                Data.order = { }
                i = 1
                s = k
            else
                i = 2
                break -- for k, v
            end
        end
        end -- for k, v
        if i > 1 then
            local pointers = { }
            local points = { }
            for k, v in pairs( Data.tree.params ) do
                i = facet( k, 1 )
                if i then
                    table.insert( points, i )
                    pointers[ i ] = k
                    i = facet( k, i )
                    if i then
                        s = "Parameter '%s' detected twice"
                        Fault( string.format( s, k ) )
                    end
                end
            end
            else
                s = "Parameter '%s' not detected"
```

```
        Fault( string.format( s, k ) )
    end
end -- for k, v
table.sort( points )
for i = 1, #points do
    table.insert( Data.order, pointers[ points[ i ] ] )
end -- i = 1, #points
elseif s then
    table.insert( Data.order, s )
end
end
end
end -- feat()

local function feature( access )
-- Create table row for parameter, check and display violations
-- Parameter:
--     access -- string, with name
-- Returns <tr>
local mode, s, status
local fine = function ( a )
    s = mw.text.trim( a )
    return a == s and
        a ~= "" and
        not a:find( "%|=\n" ) and
        not a:find( "%s%s" )
end
local begin = mw.html.create( "td" )
local code = mw.html.create( "code" )
local desc = mw.html.create( "td" )
local legal = true
local param = Data.tree.params[ access ]
local ranking = { "required", "suggested", "optional", "deprecated" }
local r = mw.html.create( "tr" )
local sort, typed

for k, v in pairs( param ) do
    if v == "" then
        param[ k ] = false
    end
end -- for k, v

-- label
sort = param.label or access
if sort:match( "^%d+$" ) then
    begin:attr( "data-sort-value",
        string.format( "%05d", tonumber( sort ) ) )
end
begin:css( "font-weight", "bold" )
:wikitext( sort )

-- name and aliases
code:css( "font-size", "92%" )
:css( "white-space", "nowrap" )
:wikitext( access )
if not fine( access ) then
    code:addClass( "error" )
    Fault( string.format( "Bad ID params.<code>%s</code>", access ) )
    legal = false
    begin:attr( "data-sort-value", " " .. sort )
end
code = mw.html.create( "td" )
:node( code )
```

```
if access:match( "^%d+$" ) then
    code:attr( "data-sort-value",
              string.format( "%05d", tonumber( access ) ) )
end
if type( param.aliases ) == "table" then
    local lapsus
    for k, v in pairs( param.aliases ) do
        code:tag( "br" )
        if type( v ) == "string" then
            if not fine( v ) then
                lapsus = true
                code:node( mw.html.create( "span" )
                          :addClass( "error" )
                          :css( "font-style", "italic" )
                          :wikitext( "string" ) )
            end
            code:wikitext( s )
        else
            lapsus = true
            code:node( mw.html.create( "code" )
                      :addClass( "error" )
                      :wikitext( type( v ) ) )
        end
    end
    end -- for k, v
    if lapsus then
        s = string.format( "params.<code>%s</code>.aliases", access )
        Fault( getLocalizedText( "invalid-value" ):gsub( "$1", s ) )
        legal = false
    end
end

-- description etc.
s = feasible( param )
if s then
    desc:node( s )
end
if param.suggestedvalues or param.default or param.example or param.autovalue
local details = { "suggestedvalues", "default", "example", "autovalue" }
local dl      = mw.html.create( "dl" )
local dd, section, show, sv
for i = 1, #details do
    s = details[ i ]
    show = param[ s ]
    if show then
        section = getLocalizedText( "doc-param-" .. s )
        dt      = mw.html.create( "dt" ):wikitext( section )
        dd      = mw.html.create( "dd" )
        if type( show ) == "string" and (string.len(show) < 80) then
            dt:cssText("float: left;margin-right: 1.6em;")
        end
        if param.type == "boolean" then
            if (type( show ) == "table") then
                -- "suggestedvalues"
                for i = 1, #show do
                    sv = show[ i ]
                    if i > 1 then
                        dd:wikitext("&#10;")
                    end
                    if sv == "0" then
                        dd:wikitext("<span style=\"color: #610; font-weig")
                    elseif sv == "1" then
                        dd:wikitext("<span style=\"color: #050; font-weig")
                    else
                        dd:tag("code"):wikitext( sv )
                    end
                end
            end
        end
    end
end
```

```

        end
        end
        elseif show == "0" then
            dd:wikitext("<span style=\"color: #610; font-weight: bold\">")
        elseif show == "1" then
            dd:wikitext("<span style=\"color: #050; font-weight: bold\">")
        else
            dd:wikitext( show )
        end
        elseif type( show ) == "table" then
            -- "suggestedvalues"
            for i = 1, #show do
                sv = show[ i ]
                if i > 1 then
                    dd:wikitext("&#10;")
                end
                dd:tag("code"):wikitext( sv )
            end
        else
            dd:wikitext( show )
        end
        dl:node( dt )
            :node( dd )
    end
end -- i = 1, #details
desc:node( dl )
end

-- type
if param.type then
    s = Permit.types[ param.type ]
    typed = mw.html.create( "td" )
    if s then
        if type( s ) == "string" then
            Data.params[ access ].type = s
            typed:wikitext( getLocalizedText( "doc-param-type-" .. s ) )
                :tag( "br" )
            typed:node( mw.html.create( "span" )
                :addClass( "error" )
                :wikitext( param.type ) )
            Data.lasting = true
        else
            s = getLocalizedText( "doc-param-type-" .. param.type )
            typed:wikitext( s )
        end
    else
        Data.params[ access ].type = "unknown"
        typed:addClass( "error" )
            :wikitext( "INVALID" )
        s = string.format( "params.<code>%s</code>.type", access )
        Fault( getLocalizedText( "invalid-value" ):gsub( "$1", s ) )
        legal = false
    end
end
else
    typed = mw.html.create( "td" )
        :wikitext( getLocalizedText( "doc-param-type-unknown" ) )
end

-- status
if param.required then
    mode = 1
    if param.deprecated then
        Fault( string.format( "Required deprecated <code>%s</code>",
            access ) )
    end
end
end
```

```
        legal = false
    end
elseif param.deprecated then
    mode = 4
elseif param.suggested then
    mode = 2
else
    mode = 3
end
status = ranking[ mode ]
ranking = getLocalizedText( "doc-param-status-" .. status )
if mode == 1 or mode == 4 then
    ranking = mw.html.create( "span" )
                :css( "font-weight", "bold" )
                :wikitext( ranking )
    if type( param.deprecated ) == "string" then
        ranking:tag( "br" )
        ranking:wikitext( param.deprecated )
    end
end
end

-- <tr>
r:attr( "id", "templatedata:" .. mw.uri.anchorEncode( access ) )
:cssText( Permit.styles[ status ] )
:node( begin )
:node( code )
:node( desc )
:node( typed )
:node( mw.html.create( "td" )
                :attr( "data-sort-value", tostring( mode ) )
                :node( ranking ) )

:newline()
if not legal then
    r:css( "border", "#FF0000 3px solid" )
end
return r
end -- feature()

local function features()
-- Create <table> for parameters
-- Returns <table>, or nil
local r
if Data.tree and Data.tree.params then
    local style = Permit.styles.tableheadbg
    local tbl = mw.html.create( "table" )
                :addClass( "wikitable" )

    local tr = mw.html.create( "tr" )
    feat()
    if Data.order and #Data.order > 1 then
        tbl:addClass( "sortable" )
    end
--
    if Config.classTable then
        tbl:addClass( Config.classTable )
    end
--
    if Config.stylesTable then
        tbl:cssText( Config.stylesTable )
    end
    tr:node( mw.html.create( "th" )
                :attr( "colspan", "2" )
                :cssText( style )
                :wikitext( getLocalizedText( "doc-param-name" ) ) )
    :node( mw.html.create( "th" )
```

```

        :cssText( style )
        :wikitext( getLocalizedText( "doc-param-desc" ) ) )
:node( mw.html.create( "th" )
      :cssText( style )
      :wikitext( getLocalizedText( "doc-param-type" ) ) )
:node( mw.html.create( "th" )
      :cssText( style )
      :wikitext( getLocalizedText( "doc-param-status" ) ) )
tbl:newline()
--   :node( mw.html.create( "thead" )
--       :node( tr )
--   )
:newline()
if Data.order then
    for i = 1, #Data.order do
        tbl:node( feature( Data.order[ i ] ) )
    end -- for i = 1, #Data.order
end
if Config.stylesTabWrap then
    r = mw.html.create( "div" )
        :cssText( Config.stylesTabWrap )
        :node( tbl )
else
    r = tbl
end
end
return r
end -- features()

local function finalize()
    -- Wrap presentation into frame
    -- Returns string
    local r
    if Data.div then
        r = tostring( Data.div )
    elseif Data.strip then
        r = Data.strip
    else
        r = ""
    end
    return r .. failures()
end -- finalize()

local function find()
    -- Find JSON data within page source (title)
    -- Returns string, or nil
    local s = Data.title:getContent()
    local i, j = s:find( "<templatedata>", 1, true )
    local r
    if i then
        local k = s:find( "</templatedata>", j, true )
        if k then
            r = mw.text.trim( s:sub( j + 1, k - 1 ) )
        end
    end
    return r
end -- find()
```

```
local function flat( adjust )
  -- Remove formatting from text string
  -- Parameter:
  --   arglist -- string, to be stripped, or nil
  -- Returns string, or nil
  local r
  if adjust then
    r = adjust:gsub( "\n", " " )
    if r:find( "<noexport>", 1, true ) then
      r = r:gsub( "<noexport>(.*?)</noexport>", "" )
    end
    r = plaintext._main(r)
    if r:find( "&", 1, true ) then
      r = mw.text.decode( r )
    end
  end
  return r
end -- flat()

local function flush()
  -- JSON encode narrowed input; obey unnamed (numerical) parameters
  -- Returns <templatedata> JSON string
  local r
  if Data.tag then
    r = mw.text.jsonEncode( Data.tag ):gsub( "%}$", ", " )
  else
    r = "{"
  end
  r = r .. "\n\"params\":{"
  if Data.order then
    local sep = ""
    local s
    for i = 1, #Data.order do
      s = Data.order[ i ]
      r = string.format( "%s%s\n%s:%s",
                          r,
                          sep,
                          mw.text.jsonEncode( s ),
                          mw.text.jsonEncode( Data.params[ s ] ) )
      sep = ",\n"
    end -- for i = 1, #Data.order
  end
  r = r .. "\n}\n}"
  return r
end -- flush()

local function focus( access )
  -- Check components; focus multilingual description, build trees
  -- Parameter:
  --   access -- string, name of parameter, nil for root
  local f = function ( a, at )
    local r
    if at then
      r = string.format( "<code>params.%s</code>", at )
    else
      r = "'root'"
    end
    if a then
      r = string.format( "%s<code>.%s</code>", r, a )
    end
  end
```

```
        return r
    end
local parent
if access then
    parent = Data.got.params[ access ]
else
    parent = Data.got
end
if type( parent ) == "table" then
    local elem, got, permit, s, scope, slot, tag, target
    if access then
        permit = Permit.params
        if type( access ) == "number" then
            slot = tostring( access )
        else
            slot = access
        end
    else
        permit = Permit.root
    end
    for k, v in pairs( parent ) do
        scope = permit[ k ]
        if scope then
            s = type( v )
            if s == "string" then
                v = mw.text.trim( v )
            end
            if scope:find( s, 1, true ) then
                if scope:find( "I18N", 1, true ) then
                    if s == "string" then
                        elem = handleNoexportWhitespace( v )
                    else
                        local translated
                        v, translated = faraway( v )
                        if v then
                            if translated and
                               k == "description" then
                                elem = { [ 1 ] = handleNoexportWhitespace( v ),
                                           [ 2 ] = translated }
                            else
                                elem = handleNoexportWhitespace( v )
                            end
                        else
                            elem = false
                        end
                    end
                end
                if v then
                    if scope:find( "nowiki", 1, true ) then
                        elem = mw.text.nowiki( v )
                    else
                        v = flat( v )
                    end
                end
            end
        else
            if k == "params" and not access then
                v = nil
                elem = nil
            elseif k == "format" and not access then
                v = mw.text.decode( v )
                elem = v
            elseif k == "inherits" then
                elem = v
                if not Data.heirs then
                    Data.heirs = { }
                end
            end
        end
    end
end
```

```

        end
        Data.heirs[ slot ] = v
        v = nil
    elseif s == "string" then
        v = mw.text.nowiki( v )
        elem = v
    else
        elem = v
    end
end
if type( elem ) ~= "nil" then
    if not target then
        if access then
            if not Data.tree.params then
                Data.tree.params = { }
            end
            Data.tree.params[ slot ] = { }
            target = Data.tree.params[ slot ]
        else
            Data.tree = { }
            target = Data.tree
        end
    end
    target[ k ] = elem
    elem = false
end
if type( v ) ~= "nil" then
    if not tag then
        if access then
            if not Data.params then
                Data.params = { }
            end
            Data.params[ slot ] = { }
            tag = Data.params[ slot ]
        else
            Data.tag = { }
            tag = Data.tag
        end
    end
    tag[ k ] = v
end
else
    s = string.format( "Type <code>%s</code> bad for %s",
        scope, f( k, slot ) )
    Fault( s )
end
else
    Fault( "Unknown component " .. f( k, slot ) )
end
end -- for k, v
else
    Fault( f() .. " needs to be of <code>object</code> type" )
end
end -- focus()

local function format()
    -- Build presented documentation
    -- Returns <div>
    local r = mw.html.create( "div" )
    local s = feasible( Data.tree, true )
    if s then
        r:node( s )
    end
end
```

```
end
if Data.leading then
  local toc = mw.html.create( "div" )
  if Config.suppressTOCnum then
    toc:addClass( Config.suppressTOCnum )
  end
  toc:css( "margin-top", "0.5em" )
  :wikitext( "__TOC__" )
  r:newline()
  :node( toc )
  :newline()
end
s = features()
if s then
  if Data.leading then
    r:node( mw.html.create( "h2" )
      :wikitext( getLocalizedText( "doc-params" ) ) )
    :newline()
  end
  r:node( s )
end
if Data.tree and Data.tree.format then
  local e, style
  s = Data.tree.format:lower( Data.tree.format )
  if s == "inline" or s == "block" then
    style = "i"
  else
    style = "code"
  end
  r:node( mw.html.create( "p" )
    :wikitext( "Format: " )
    :node( mw.html.create( style )
      :wikitext( s ) ) )
end
return r
end -- format()

local function free()
  -- Remove JSON comment lines
  Data.source:gsub( "([{\,\\"'])(%s*\n%s*//.*\n%s*)([{\,\\"'])",
    "%1%3" )
end -- free()

local function full()
  -- Build HTML table for display from JSON data, and append an invisible
  -- <templatedata> block.
  Data.div = mw.html.create( "div" )
    :addClass( "mw-templatedata-doc-wrap" )
  focus()
  if Data.tag then
    if type( Data.got.params ) == "table" then
      for k, v in pairs( Data.got.params ) do
        focus( k )
      end -- for k, v
      if Data.heirs then
        fathers()
      end
    end
  end
end
Data.div:node( format() )
```

```
if not Data.lazy then
  Data.slim = flush()
  if TemplateData.frame then
    local div = mw.html.create( "div" )
    local tdata = { [ 1 ] = "templatedata",
                   [ 2 ] = Data.slim }
    Data.strip = TemplateData.frame:callParserFunction( "#tag",
                                                         tdata )

    div:wikitext( Data.strip )
    if Config.loudly then
      -- Display raw templatedata table all the time.
      Data.div:node( mw.html.create( "hr" ) )
      Data.div:node( div )
    else
      -- Creates an expand link to check raw templatedata table.
      local wrapper = mw.html.create( "div" )
      wrapper:addClass( "mw-collapsible" )
      wrapper:addClass( "mw-collapsed" )
      wrapper:css( "font-size", "85%" )
      div:addClass( "mw-collapsible-content" )
      wrapper:wikitext( ''''Test of raw TemplateData output''': " )
      wrapper:node( div )
      Data.div:node( wrapper )
    end
  end
end
end
end -- full()

local function furnish( adapt, arglist )
  -- Called by f, this function is the first to do any real work when the
  -- module is invoked.
  -- Parameter:
  --   adapt    -- table, #invoke parameters
  --   arglist  -- table, template parameters
  -- Returns string
  --local spy=""
  local source
  for k, v in pairs( Config ) do
    if adapt[ k ] and adapt[ k ] ~= "" then
      Config[ v ] = adapt[ k ]
    end
  end
  end -- for k, v
  Config.loudly = faculty( arglist.debug or adapt.debug )
  --if mw.site.server:find( "//de.wikipedia.beta.wmflabs.org", 1, true ) then
  --  Config.loudly = true
  --end
  Data.lazy = faculty( arglist.lazy ) and not Config.loudly
  Data.leading = faculty( arglist.TOC )
  if arglist.JSON then
    source = arglist.JSON
  elseif _ne( arglist.TNT ) then
    local tnt = require( "Module:TNT" )
    source = tnt.getTemplateData( "Templatedata/"
                                  .. mw.text.trim( arglist.TNT ) )
  elseif arglist[ 1 ] then
    local s = mw.text.trim( arglist[ 1 ] )
    local start = s:sub( 1, 1 )
    if start == "<" then
      Data.strip = s
    elseif start == "{" then
      source = s
    elseif mw.usttring.sub( s, 1, 8 ) ==
```

```
        mw.usttring.char( 127, 39, 34, 96, 85, 78, 73, 81 ) then -- <DEL>
        Data.strip = s
    end
end
if not source then
    Data.title = mw.title.getCurrentTitle()
    source = find()
    if not source and
        Config.subpage and Config.suffix and
        not Data.title.text:match( Config.subpage ) then
        local s = string.format( Config.suffix,
                                Data.title.prefixedText )
        Data.title = mw.title.new( s )
        if Data.title.exists then
            source = find()
        end
    end
end
--if source and
--    ( source:find( "|", 1, true ) or
--      source:find( "}}", 1, true ) ) then
--    -- <ref
--spy=string.format( "[[category:%s]]", Config.strange )
--end
end
if not Data.lazy and Config.subpage then
    if not Data.title then
        Data.title = mw.title.getCurrentTitle()
    end
    Data.lazy = Data.title.text:match( Config.subpage )
end
TemplateData.getPlainJSON( source )
return finalize()
--return spy .. finalize()
end -- furnish()

TemplateData.failSAFE = function ( assert )
    -- Checks the age of this implementation against some minimum ("assert")
    local r
    if not assert or assert <= TemplateData.serial then
        r = TemplateData.serial
    else
        r = false
    end
    return r
end -- TemplateData.failSAFE()

TemplateData.getPlainJSON = function ( adapt )
    -- Reduce enhanced JSON data to plain text localized JSON
    -- Parameter:
    --   adapt -- string, with enhanced JSON
    -- Returns string, or not
    if type( adapt ) == "string" then
        Data.source = adapt
        free()
        Data.got = mw.text.jsonDecode( Data.source )
        if Data.got then
            full()
            if Data.lasting then
                Fault( "deprecated type syntax" )
            end
        end
    end
end
```



```
        if Data.less then
            Fault( Config.solo )
        end
    elseif not Data.strip then
        Fault( "fatal JSON error" )
    end
end
return Data.slim
end -- TemplateData.getPlainJSON()

TemplateData.test = function ( adapt, arglist )
    TemplateData.frame = mw.getCurrentFrame()
    return furnish( adapt, arglist )
end -- TemplateData.test()

-- Export
local p = { }

p.f = function ( frame )
    -- The entry point for templates invoking the module.
    -- Just wraps furnish in an exception handler.
    local lucky, result
    TemplateData.frame = frame
    lucky, result = pcall( furnish, frame.args, frame:getParent().args )
    if not lucky then
        Fault( "INTERNAL: " .. result )
        result = failures()
    end
    return result
end -- p.f()

p.failsafe = function ( frame )
    -- Versioning interface
    local s = type( frame )
    local since
    if s == "table" then
        since = frame.args[ 1 ]
    elseif s == "string" then
        since = frame
    end
    if since then
        since = mw.text.trim( since )
        if since == "" then
            since = false
        end
    end
    return TemplateData.failsafe( since ) or ""
end -- p.failsafe()

p.TemplateData = function ( )
    -- Module interface
    return TemplateData
end

return p
```