Modul:Format TemplateData

Vorlage:Nutshell Vorlage:Lua

`TemplateData` – Module with auxilary 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

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

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: `< > & "  ` 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

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

- 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

Details

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)

A test page illustrates practical use.

Vorlage:Anchor Functions for Lua modules (API)

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.failsafe(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,    -- 1= 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: #FD
                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*:" )
```

```
        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    -- while j
        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 -- for k, v
    if n > 0 then
        for k, v in pairs( variants ) do
            if v then
                if n == 1 then
                    r1 = v
```

```
                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 -- 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 -- 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 -- for k, v
            end
        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( ba
                            Fault( string.format( "Invalid <code>lang=%s</code>",
                    end
                end
            end -- for k, v
        end
    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 -- 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 ] )
```

```
            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
    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 -- 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
                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 -- 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 -- 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
                    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
    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 ) )
```

```
            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

    -- <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
```

```
                    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
                        if v then
                            if scope:find( "nowiki", 1, true ) then
                                elem = mw.text.nowiki( v )
                            else
                                v = flat( v )
                            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
                            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
    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
    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 -- 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 -- 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.ustring.sub( s, 1, 8 ) ==
```

```
                mw.ustring.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
--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
```

```
            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
```