Installation

- Doxygen (http://www.doxygen.nl/download.html). For windows, there is:
    - A self-installing archive (doxygen-1.8.17-setup.exe) with the GUI frontend and HTML versions of manual
    - A doxygen binary download in zip (64-bit version)
    → **Download the 64-bit version of the doxygen binary in zip**. We don't need the GUI front end, because we are setting the within CMake.
    → **Extract into "C:/thirdparty"**
- DOT package. This GraphViz package is necessary for creating the dependency diagrams etc. in the documentation.
    → **Download the DOT package**
    (https://graphviz.gitlab.io/_pages/Download/windows/graphviz-2.38.zip)
    → **Extract into "C:/thirdparty"**

    (Alternatively run "Get_Doxygen.cmd" and "Get_Dot.cmd" under ".../Open-Infra-Platform/external". This should be suggested to you when configuring CMake if they are missing anyway.)

Doxygen in CMake

Including doxygen in top-level "CMakelists.txt" (.../Open-Infra-Platform/CMakelists.txt):

```
# --------------------------------------------------------------------------
# DOXYGEN.
#--------------------------------------------------------------------------
Option(DOXYGEN_GENERATE_DOCUMENTATION ON)


if(DOXYGEN_GENERATE_DOCUMENTATION)
include(ConfigureDoxygen OPTIONAL)   # Refer to
${CMAKE_CURRENT_SOURCE_DIR}/cmake/ConfigureDoxygen.cmake
else()
message("DOXYGEN_GENERATE_DOCUMENTATION box not checked. Thus not generating
doxygen documentation for TUM Open Infra Platform project. To generate doxygen
documentation, check the box next to DOXYGEN_GENERATE_DOCUMENTATION.")
endif(DOXYGEN_GENERATE_DOCUMENTATION)
```

Doxygen configuration in "ConfigureDoxygen.cmake"
(.../Open-Infra-Platform/cmake/ConfigureDoxygen.cmake)

```cmake
# CONFIGURATION. Check http://www.doxygen.nl/manual/config.html for all available
options and their default values.



# Build related configuration options.
set(DOXYGEN_PROJECT_NAME OpenInfraPlatform)
set(DOXYGEN_PROJECT_BRIEF "Open source software for viewing and converting alignment
data.")
set(DOXYGEN_PROJECT_LOGO ${CMAKE_CURRENT_SOURCE_DIR}/Documentation/interface.png)
set(DOXYGEN_CREATE_SUBDIRS YES)
set(DOXYGEN_HAVE_DOT YES) # GraphViz Package for diagrams



# Configuration file generation using CMake.
set(DOXYFILE_CMAKE ${CMAKE_CURRENT_BINARY_DIR}/CMakeDoxyfile.in)
set(DOXYFILE ${CMAKE_CURRENT_BINARY_DIR}/Doxyfile)



# Documentation settings.
set(DOXYGEN_EXTRACT_ALL YES) # Set to yes if you want to extract all existing
documentation  from project. Do this for now, once starting proper documentation
change to NO.

set(DOXYGEN_RECURSIVE YES) #Search subdirectories for input files as well.
set(DOXYGEN_INTERNAL_DOCS NO) # Comments intended for developers and not for users
(*! \internal *)
set(DOXYGEN_CLASS_DIAGRAMS YES)



# Output (HTML/Latex/...) configuration options.
set(DOXYGEN_GENERATE_HTML YES)
set(DOXYGEN_GENERATE_LATEX NO)
set(DOXYGEN_OUTPUT_DIRECTORY ${CMAKE_CURRENT_SOURCE_DIR}/Documentation/doxymentation)
set(DOXYGEN_SEARCHENGINE YES)
set(DOXYGEN_SOURCE_BROWSER YES)
set(DOXYGEN_SUBGROUPING YES)
set(DOXYGEN_EXCLUDE ${CMAKE_CURRENT_SOURCE_DIR}/CurrentlyExcluded
${CMAKE_CURRENT_SOURCE_DIR}/build ${CMAKE_CURRENT_SOURCE_DIR}/deploy
${CMAKE_CURRENT_SOURCE_DIR}/Documentation ${CMAKE_CURRENT_SOURCE_DIR}/external
${CMAKE_CURRENT_SOURCE_DIR}/testdata ${CMAKE_CURRENT_SOURCE_DIR}/Tools
${CMAKE_CURRENT_SOURCE_DIR}/UnitTests)
```

```cmake
configure_file(${DOXYFILE_CMAKE} ${DOXYFILE} @ONLY)



# Documentation for entire OPEN INFRA PLATFORM project.
doxygen_add_docs(GenerateDocumentation ALL
${CMAKE_CURRENT_SOURCE_DIR}  # Actual documented code here
WORKING DIRECTORY ${CMAKE_CURRENT_SOURCE_DIR}        # Current root
COMMENT "Generating doxymentation for TUM Open Infra Platform project.")

# Add important links to GenerateDocumentation Visual Studio project to facilitate
access.
#set(OpenInfraPlatform_Documentation_ImportantLinks
#${CMAKE_CURRENT_SOURCE_DIR}/Documentation/doxymentation/html/index.html
#${CMAKE_CURRENT_SOURCE_DIR}/Documentation/doxymentation/html/classes.html

#${CMAKE_CURRENT_SOURCE_DIR}/Documentation/doxymentation/html/namespaces.html
#)


else()
message("Doxygen not found. Please install doxygen using
${CMAKE_CURRENT_SOURCE_DIR}/external/Get_Doxygen.cmd to be able to generate
documentation for the project. Please also install the GraphViz DOT package using
${CMAKE_CURRENT_SOURCE_DIR}/external/Get_Dot.cmd for rendering diagrams.")
endif(DOXYGEN_FOUND)
```

Building the project in VS and browsing the documentation

→ Build "GenerateDocumentation".
This is created from doxygen_add_docs target "GenerateDocumentation" set in ConfigureDoxygen.cmake before:

```
# Documentation for entire OPEN INFRA PLATFORM project.
doxygen_add_docs(GenerateDocumentation ALL
${CMAKE_CURRENT_SOURCE_DIR}  # Actual documented code here
WORKING DIRECTORY ${CMAKE_CURRENT_SOURCE_DIR}       # Current root
COMMENT "Generating doxymentation for TUM Open Infra Platform project.")
```

In the ".../Documentation/doxymentation" directory you will then find something called "index.html". This is a link to the index page of the HTML documentation browser.
Still trying to figure out a way to a shorter/easier link.

Style Sheet

Style sheet for commenting code with doxygen
(.../Open-Infra-Platform/Documentation/doxymentation/StyleSheetOIP)

For now, refer to this style sheet, later we'll use an example class from OIP.

Overview:

Comment blocks:

- Detailed description:

/*!
* ... text
*/

- Brief description:

/*! \brief description as long as paragraph
*
* After skipping a line, detailed description starts.
*/

- In Body descriptions:

int var /*< for detailed descriptions after member, only for members and parameters. Avoid structural comments, as they lead to duplication of information.*/

- Internal comments:

/*! \internal These comments can be included and excluded separately. Handy for developer-only comments.
*/

- Parameters:
/*! \param
 */

-    See also:
\sa

- Code blocks:
Entire source code file: http://www.doxygen.nl/manual/commands.html#cmdinclude
Code snippet: http://www.doxygen.nl/manual/commands.html#cmdsnippet

(... und noch mehr Möglichkeiten, z.B: @code…@endcode)

- Links to other classes, files, functions:
If in correct format, will recognize class, file, function names as such and create a link automatically.
http://www.doxygen.nl/manual/autolink.html

- Custom commands:
http://www.doxygen.nl/manual/custcmd.html

- Linking to external documentation:
http://www.doxygen.nl/manual/external.html

Example:
Eigen C++ library for linear algebra:
http://eigen.tuxfamily.org/dox/index.html

Doxygen Manual:
http://www.doxygen.nl/manual/index.html