University of Zurich^{UZH}	**Test Plan for** **(Project)**	Author: (Besken, Barth, Tornow, Charlé)
		Doc.No.: GMLG-TEST
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		Page of Pages: 1 of 28

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Revision History

Date	Version	Description	Author(s)
			Clara Maria Barth
4.12.17	1	Final version	Timucin Besken

1   Public API Overview

1.1   Public classes to be tested

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1.2   Public Routines

GMLG
- make(a_title: STRING; a_name: STRING)
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GMLG_ANCHOR_LINK
- link_to(tag: GMLG_TAG)

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GMLG_IMG
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GMLG_LOCAL_LINK
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GMLG_HEADING

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GMLG_TABLE

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- add_number(ele: INTEGER; row, column: INTEGER)
- add_string(ele: STRING; row, column: INTEGER)
- toggle_bordered

GMLG_PARAGRAPH
- add_block(a_string: STRING; a_style: STRING)

2   Test Suite Description

This test suite will test all the functional features of the library in order to see if the expected result is met.
Another thing we'll test are the valid input of the end user and if the library manage to solve those unexpected inputs in the desired way.

2.1   Individual Tests

2.1.1   Class: GMLG

Property	Description
Test ID	FR 2.1.1.0
Title	Make a page
Test	make(a_title: STRING; a_name: STRING)
Description	Create a new page
Set-Up	None
Tear-Down	remove_page(a_page: GMLG) Remove the page created in order to clean test.
Test-Data	- a_title: "A wonderful title" - name: "name"
Oracle	- precondition: - page_name_not_empty: a_name /= Void - page_name_less_than_20_chars: a_name.count <= 20 Postcondition: - Page creted with ● title: "A wonderful title" ● name: "name" - Empty linked list created (count = 0)

Property	Description
Test ID	FR 2.1.1.0.1
Title	Unsupported page name
Test	make(a_title: STRING; a_name: STRING)
Description	Create a new page with an unsupported name

Set-Up	None
Tear-Down	remove_page(a_page: GMLG) Remove the page created in order to clean test.
Test-Data	- a_title: "A wonderful title" - name: "a name"

Oracle	- precondition:
	    - page_name_not_empty: a_name /= Void
	    - page_name_less_than_20_chars: a_name.count <= 20
	Postcondition:
	 - Page creted with
	    ● title: "A wonderful title"
	    ● name: "a name"
	- Empty linked list created (count = 0)
	- Error output on the console stating that the name is not supported

Property	Description
Test ID	FR 2.1.1.1
Title	Add image
Test	add_img(src: STRING): GMLG_IMG
Description	Add an image to the page works as expected

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	- src: "https://zampeamollo.ch/public/images/uploads/gallery-24227.jpg"

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_IMG
	- Object created with:
	    - src = "https://zampeamollo.ch/public/images/uploads/gallery-24227.jpg"
	    - width = 50
	    - height = 50
	    - class_attr = "image"
	    - id = 0

Property	Description
Test ID	FR 2.1.1.2
Title	Add thematic break
Test	add_thbr: GMLG_THEMATIC_BREAK
Description	Test that adding a thematic break works as expected

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"

Tear-Down	None
Test-Data	- created thematic break call.

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_THEMATIC_BREAK
	- Object created with:
	  - class_attr = "thematic-break"
	  - id = 0

Property	Description
Test ID	FR 2.1.1.3
Title	Add anchor link
Test	add_anchor_link(a_text: STRING): GMLG_ANCHOR_LINK
Description	Test that adding an anchor link works as expected but not that it can actually be linke to something (this will be tested later)

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"

Tear-Down	None
Test-Data	- a_text: "This is an anchor link"

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_ANCHOR_LINK
	- Object created with:
	  - class_attr = "anchor-link"
	  - text = This is an external link
	  - id = 0

Property	Description
Test ID	FR 2.1.1.4
Title	Add local link
Test	add_local_link(a_text: STRING): GMLG_LOCAL_LINK
Description	Test that adding a local link works as expected but not that it can actually be linke to something (this will be tested later)
Set-Up	- Create a new page - Title: "Title" - name: "test"
Tear-Down	None
Test-Data	- a_text: "This is a local link"
Oracle	- Tags count of the page increased by 1 - First element of tags list is of type GMLG_LOCAL_LINK - Object created with: - class_attr = "local-link" - text = This is an external link - id = 0

Property	Description
Test ID	FR 2.1.1.5
Title	Add external link
Test	add_extl_link(a_text: STRING): GMLG_EXT_LINK
Description	Test that adding an external link works as expected but not that it can actually be linke to something (this will be tested later)
Set-Up	- Create a new page - Title: "Title" - name: "test"
Tear-Down	None
Test-Data	- a_text: "This is an external link"
Oracle	- Tags count of the page increased by 1 - First element of tags list is of type GMLG_EXT_LINK - Object created with:

	- class_attr = "external-link" - text = This is an external link - id = 0

Property	Description
Test ID	FR 2.1.1.6
Title	Add paragraph
Test	add_paragraph: GMLG_PARAGRAPH
Description	Test that adding a paragraph works as expected

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	None

Oracle	- Tags count of the page increased by 1
	 - First element of tags list is of type GMLG_PARAGRAPH
	 - Object created with:
	    - class_attr = "paragraph"
	    - id = 0

Property	Description
Test ID	FR 2.1.1.7
Title	Add snippet
Test	add_snippet(code: STRING): GMLG_SNIPPET
Description	Test that adding a code snippet works as expected

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	code: "<iframe width="560" height="315" src="https://www.youtube.com/embed/4GFAZBKZVJY?rel=0&showinfo=0" frameborder="0" allowfullscreen></iframe>"

| Oracle | - Tags count of the page increased by 1
- First element of tags list is of type GMLG_SNIPPET
- Object created with:
    - class_attr = "snippet"
    - code = (the one just passed)
    - div = False
    - id = 0 |

Property	Description
Test ID	FR 2.1.1.8
Title	Add heading
Test	add_heading(text: STRING; level: INTEGER): GMLG_HEADING
Description	Test that adding a heading works as expected

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	text: "This is a heading" level: 6

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_HEADING
	- Object created with:
	    - class_attr = "heading"
	    - text = This is a heading
	    - level = 6
	    - id = 0
	- Pre-condition: 1 <= level <= 6
	- Pre-condition: text /= ""

Property	Description
Test ID	FR 2.1.1.8.0
Title	Add heading with empty text
Test	add_heading(text: STRING; level: INTEGER): GMLG_HEADING
Description	Test that adding a heading with an empty text will throw a pre-condition violation exception

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	text: "" level: 6
Oracle	- Pre-condition violated: text_non_empty - Pre-condition: 1 <= level <= 6 - Pre-condition: text /= ""

Property	Description
Test ID	FR 2.1.1.8.1
Title	Add heading with illegal level
Test	add_heading(text: STRING; level: INTEGER): GMLG_HEADING
Description	Test that adding a heading with an illegal level value will throw a pre-condition violation exception

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	text: "This is a heading" level: 12
Oracle	- Pre-condition violated: legal_level - Pre-condition: 1 <= level <= 6 - Pre-condition: text /= ""

Property	Description
Test ID	FR 2.1.1.9
Title	Add table
Test	add_table(rows : INTEGER; cols : INTEGER): GMLG_TABLE
Description	Test that adding a table works as expected
Set-Up	- Create a new page - Title: "Title"

	- name: "test"
Tear-Down	None
Test-Data	rows: 4 cols: 4

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_TABLE
	- Object created with:
	    - class_attr = "table"
	    - rows: 4
	    - cols: 4
	    - bordered: False
	    - generating_page = same as setup page
	    - id = 0

Property	Description
Test ID	FR 2.1.1.10
Title	Add Linebreak
Test	add_linebreak: GMLG_LINEBREAK
Description	Test that adding a linebreak works as expected

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"

Tear-Down	None
Test-Data	None

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_LINEBREAK
	- Object created with:
	    - class_attr = "linebreak"
	    - id = 0

Property	Description
Test ID	FR 2.1.1.11
Title	Add List
Test	add_list(order: BOOLEAN): GMLG_LIST
Description	Test that adding a linebreak works as expected

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"

Tear-Down	None
Test-Data	order: True

Oracle	- Tags count of the page increased by 1
	- First element of tags list is of type GMLG_LIST
	- Object created with:
	  - class_attr = "list"
	  - id = 0
	  - ordered: True

Property	Description
Test ID	FR 2.1.1.12
Title	Generate HTML code
Test	generate_html_code: STRING
Description	Generate html code works as expected
Set-Up	None
Tear-Down	None

Test-Data	- Create a new page(0)
	  - Title: "Title"
	  - name: "test"
	- add an image to the page (1)
	  - src: img.jpg
	- add a thematic break to the page
	- add an anchor link to the page
	  - text: "anchor link"
	  - link anchor link to the first image (1)
	- add a local link to the page
	  - text: "local link"

	- link local link to the page (0)
	- add an external link to the page
	  - text: "external link"
	  - link external link to "https://google.com"
	- add a paragraph to the page
	  - add block
	    - text: "no style here"
	    - style: ""
	  - add block
	    - text: "this is italic"
	    - style: "italic"
	  - add block
	    - text: "and this is bold"
	    - style: "bold"
	  - add block
	    - text: "and this underlined"
	    - style: "underlined"
	- add snippet to the page
	  - code: <script>alert("hello");</script>
	- add heading to the page:
	  - text: "This is a heading"
	  - level: 6
	- add image (2)
	  - src: "test_table.jpg"
	- add paragraph (3)
	  - add block
	    - text: "test"
	    - style: ""
	- add table
	  - rows: 3
	  - cols: 2
	  - add number
	    - 1
	    - row: 1
	    - col: 1
	  - add number
	    - 2
	    - row: 1
	    - col: 2
	  - add string
	    - "a"
	    - row: 2
	    - col: 1
	  - add string
	    - "b"
	    - row: 2
	    - col: 2
	  - add element
	    - tag: image (2)
	    - row: 3
	    - col: 1
	  - add element

	- tag: paragraph (3)
	    - row:3
	    - col:2
	- add linebreak
	- add paragraph (4)
	    - text: "list example 1"
	    - style: ""
	- add paragraph (5)
	    - text: "list example 2"
	    - style: ""
	
	- add list
	    - order: true
	    - add content
	        - tag: paragraph (4)
	    - add content:
	        - tag: paragraph (5)

Oracle	Expected result:
	- The call should return:
	
	``html
	<!DOCTYPE html>
	<html>
	<head>
	    <meta charset='UTF-8'>
	    <title>Title</title>
	</head>
	<body>
	
	    <hr>
	    anchor link
	    local link
	    external link
	    <p class="paragraph" id="5">no style here <i>this is italic</i> and this is bold <u>and this is underlined</u></p>
	    <script>alert("hello");</script>
	    <h6 id="7">This is a heading</h6>
	    <table id="10" class="table" border="0">
	        <tr>
	            <td>1</td>
	            <td>2</td>
	        </tr>
	        <tr>
	            <td>a</td>
	            <td>b</td>
	        </tr>
	        <tr>
	            <td></td>
	            <td><p id="table_10_9" class="paragraph">test </p></td>
	        </tr>
	    </table>
	``

```
            <br>
            <ol id="12" class="list">
                  <li><p class="paragraph" id="list_12_10">list example 1</p></li>
                  <li><p class="paragraph" id="list_12_11">list example 2</p></li>
            </ol>
</body>
</html>
```

Property	Description
Test ID	FR 2.1.1.13
Title	Generate MARKDOWN code
Test	generate_markdownl_code: STRING
Description	Generate markdownl code works as expected

Set-Up	- add a local link to the page
	    - text: "local link"
	    - link local link to the page (0)
	- add an external link to the page
	    - text: "external link"
	    - link external link to "https://google.com"
	- add a paragraph to the page
	    - add block
	        - text: "no style here"
	        - style: ""
	    - add block
	        - text: "this is italic"
	        - style: "italic"
	    - add block
	        - text: "and this is bold"
	        - style: "bold"
	    - add block
	        - text: "and this underlined"
	        - style: "underlined"
	- add snippet to the page
	    - code: <script>alert("hello");</script>
	- add heading to the page:
	    - text: "This is a heading"
	    - level: 6
	- add image (2)
	    - src: "test_table.jpg"
	- add paragraph (3)
	    - add block

	- text: "test"
	- style: ""
	  - add table
	    - rows: 3
	    - cols: 2
	    - add number
	      - 1
	      - row: 1
	      - col: 1
	    - add number
	      - 2
	      - row: 1
	      - col: 2
	    - add string
	      - "a"
	      - row: 2
	      - col: 1
	    - add string
	      - "b"
	      - row: 2
	      - col: 2
	    - add element
	      - tag: image (2)
	      - row: 3
	      - col: 1
	    - add element
	      - tag: paragraph (3)
	      - row:3
	      - col:2
	- add linebreak
	- add paragraph (4)
	  - text: "list example 1"
	  - style: ""
	- add paragraph (5)
	  - text: "list example 2"
	  - style: ""
	
	- add list
	  - order: true
	  - add content
	    - tag: paragraph (4)
	  - add content:
	    - tag: paragraph (5)

Tear-Down	None
Test-Data	None (see Set-Up)
Oracle	Expected result: The call should return

![image]("img.jpg")

___
[anchor link](#0)
[local link](/test.html)
[external link](https://google.com)
no style here _this is italic_ **and this is bold** and this is underlined
<script>alert("hello");</script>
####### This is a heading
1	2
a	b
![image](test_table.jpg)	test

1. list example 1
2. list example 20

2.1.2 Class: GMLG_IMG

Property	Description
Test ID	FR 2.1.2.0
Title	Set width and height
Test	set_width (a_width: INTEGER) set_height (a_width: INTEGER)
Description	Set a width and a height to an image

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"
	- add an image to the page
	  - src: img.jpg

Tear-Down	None
Test-Data	width: 100 height: 100
Oracle	image width = 100 image height = 100 Pre-condition: width_size_invalid: a_width >= 5 and a_width <= 1024

Property	Description
Test ID	FR 2.1.2.0.1
Title	Set width and height with invalid values
Test	set_width (a_width: INTEGER) set_height (a_width: INTEGER)
Description	Set a width and a height to an image

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"
	- add an image to the page
	  - src: img.jpg

Tear-Down	None
Test-Data	width: 2000 height: 1
Oracle	Pre-condition: width_size_invalid: a_width >= 5 and a_width <= 1024 Expected result: precondition violation exception.

2.1.3 Class: GMLG_HEADING

Property	Description
Test ID	FR 2.1.2.3.0
Title	Set italic
Test	set_italic
Description	Set a heading style to italic

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"
	- add a heading to the page with:
	    - text: "This is a heading"
	    - level: 6

Tear-Down	None
Test-Data	None
Oracle	- is_italic = True

2.1.4 Class: GMLG_TABLE

Property	Description
Test ID	FR 2.1.2.4.0
Title	toggle bordered
Test	toggle_bordered
Description	Toggle bordered of a table

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"
	- Add a table with:
	  - cols: 1
	  - rows: 1

Tear-Down	None
Test-Data	None
Oracle	- Table attributes: - bordered: True

Property	Description
Test ID	FR 2.1.2.4.1
Title	Add element
Test	add_element(tag: GMLG_TAG; row, column: INTEGER)
Description	Add an element to a table cell

Set-Up	- Create a new page
	  - Title: "Title"
	  - name: "test"
	- Add a table with:
	  - cols: 1
	  - rows: 1
	- Add an image with:
	  - src: "test.jpg"

Tear-Down	None
Test-Data	image created in Set-Up, col=1, row=1

Oracle	- Table element (0,0) is of type GMLG_IMG with feature src = "test.jpg"
	- Preconditions:
	  - row_col_above_zero: row > 0 and column > 0
	  - legal_row_and_col: row <= Current.get_rows and column <= Current.get_cols
	- Expected result:
	  - image removed from page linked list
	  - page linked list count = 0
	  - image id = "table_0_1"

Property	Description

Test ID	FR 2.1.2.4.2
Title	Add number
Test	add_number(ele: INTEGER; row, column: INTEGER)
Description	Add a number to a table cell

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"
	- Add a table with:
	    - cols: 1
	    - rows: 1

Tear-Down	None
Test-Data	ele: 10

Oracle	- Table element (0,0) is of type GMLG_SNIPPET with feature code = "10"
	- Preconditions:
	    - row_col_above_zero: row > 0 and column > 0
	    - legal_row_and_col: row <= Current.get_rows and column <= Current.get_cols

Property	Description
Test ID	FR 2.1.2.4.3
Title	Add string
Test	add_string(ele: STRING; row, column: INTEGER)
Description	Add a string to a table cell

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"
	- Add a table with:
	    - cols: 1
	    - rows: 1

Tear-Down	None
Test-Data	ele: "this is a test"
Oracle	- Table element (0,0) is of type GMLG_SNIPPET with feature code = "this is a test" - Preconditions: - row_col_above_zero: row > 0 and column > 0

	- legal_row_and_col: row <= Current.get_rows and column <= Current.get_cols

2.1.5 Class: GMLG_LIST

Property	Description
Test ID	FR 2.1.2.5.0
Title	Add content
Test	add_content(tag: GMLG_TAG)
Description	Add an element to the list

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"
	- Add a list with:
	    - order: True
	- Add an img with:
	    - src: "img.jpg"

Tear-Down	None
Test-Data	Image in Set-Up

Oracle	- Expected result:
	    - list elements count + 1
	    - list elements first element of type GMLG_IMG
	    - list elements first element feature "get_src" = "img.jpg"

2.1.6 Class: GMLG_ANCHOR_LINK

Property	Description
Test ID	FR 2.1.2.6.0
Title	Link to a tag
Test	link_to(tag: GMLG_TAG)
Description	Link the anchor link to a tag
Set-Up	- Create a new page

	- Title: "Title"
	- name: "test"
	- add an anchor to the page:
	- text: "This is linked to a heading"
	- add a heading to the page with:
	- text: "This is a heading"
	- level: 6
Tear-Down	None
Test-Data	heading created in Set-up
Oracle	- Link attributes:
	- src = "#1"
	- Pre-condition: tag_id_set: tag.get_id /= Void

2.1.7 Class: GMLG_LOCAL_LINK

Property	Description
Test ID	FR 2.1.2.7.0
Title	Link to a page
Test	link_to(page: GMLG)
Description	Link the anchor link to a page
Set-Up	- Create a new page
	- Title: "Title"
	- name: "test"
	- add a local to the page:
	- text: "This is linked to a page"
	- Create a new page
	- Title: "New Title"
	- name: "anothertest"
Tear-Down	None
Test-Data	page created in Set-Up
Oracle	- Link attributes:
	- src = "/anothertest.html"

	- pre-condition: page_name_set: page.name /= Void and page.name /= ""

2.1.8 Class: GMLG_EXTERNAL_LINK

Property	Description
Test ID	FR 2.1.2.7.0
Title	Link to a URL
Test	link_to(url: STRING)
Description	Link the external link to a URL

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"
	- add an external to the page:
	    - text: "This is linked to a URL"

Tear-Down	None
Test-Data	url: "https://zampeamollo.ch"
Oracle	- Link attributes: - src = "https://zampeamollo.chl"

Property	Description
Test ID	FR 2.1.2.7.0.1
Title	Link to an invalid URL
Test	link_to(url: STRING)
Description	Link the external link to a URL

Set-Up	- Create a new page
	    - Title: "Title"
	    - name: "test"
	- add an external link to the page:

	- text: "This is linked to a URL"
Tear-Down	None
Test-Data	url: "abc"
Oracle	- Expected result: error log stating that the url is invalid in the console - link feature: - src = ""

3   Expected Coverage

We expect that those tests cover all features available to the end user with expected input and some special cases with an unexpected input.

We think that since we're covering the creation of all tags and the expected HTML and Markdown output, we can say with a certain degree of certainty that the library is stable enough if it passes all the tests.

Therefore we can estimate a coverage of 90% since all the features are used in a way or another, but we can't be certain that we didn't miss some special cases.

4   Benchmarks

Property	Description
Test ID	FR 4.1
Title	Average output time
Test	generate_html_code
Description	Check that generating html code takes less than 10 seconds in average
Set-Up	None
Tear-Down	None

Test-Data	- Create a new page
	   - Title: "Title"
	   - name: "test"
	- add an external link to the page:
	   - text: "This is linked to a URL"
	   - link_to "https://google.com"
	- add image:
	   - src: "img.jpg"
	- add table
	   - cols: 3
	   - rows: 3
	   - add_number(1,1,1)
	   - add_number(2,1,2)
	   - add_number(3,1,3)
	   - add_string("a", 2, 1)
	   - add_string("b",2,2)
	   - add_string("c",2,3)
	   - add_element

	- image created before
	     - row 3
	     - col 1
	- add image
	   - src: "example.jpg"
	- add linebreak
	- add paragraph
	   - add block
	     - "hi", "italic"

Oracle	- Expected result: output given in less than 10 seconds