Test Report for Content Management System

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Contents

1 Revision History

This section is used to record major changes to the document.

Table 1: Revision History

Changes to the Document	**Author**	**Date**
Initial draft of document	Kirk, Syed	24-02-2017
Conducted usability tests and documented results	Kirk	02-03-2017
Conducted system tests and documented results	Syed	03-03-2017
Conducted performance tests and documented results	Kirk, Syed	10-03-2017

List of Tables

2 Introduction

In this testing report we will be documenting the results for both system tests and non-functional tests on the content management system.

2.1 Acronyms

Table 2: Acronyms used

UI	User Interface
CMS	Content Management System

3 Usability Testing

3.1 Learnability

Learnability is how easy it is for users to accomplish the usability tasks the first time they encounter the user interface (UI).
Learnability was very high for most tasks due to the similarity of the tasks with common web surfing tasks such as registering for websites and filling out forms, therefore only significant deviation from common web surfing tasks which increased learnability will be noted in the individual usability tasks.

3.2 Efficiency

Efficiency pertaining to usability testing is how fast can experienced users accomplish tasks.
Efficiency was very high for most tasks also due to the similarity of the tasks with common web surfing tasks as previously mentioned with Learnability. Since efficiency is related to experienced users and a content management system (CMS) targets non-technical users, efficiency will not be noted in the individual usability tasks.

3.3 Memorability

Memorability is when users return to the usability task after not using it for a while and still remember how to do the usability task.
Memorability was very high for all tasks due to previous experience with registering for websites and filling out forms. Therefore, the Memorability aspects of the usability tasks will not be noted.

3.4 Errors

Errors are how many errors users make, how severe the errors are, and recoverability from errors.
Errors were negligible for the usability tasks due to the similarity of the usability tasks with common web surfing tasks. Errors will be reflected in the usability task completion time and will not be noted in individual usability tasks.

3.5 User Satisfaction

User satisfaction is how much did the user enjoy using the CMS.
User Satisfaction was very positive. As non-technical users, the idea of creating web pages with a word processor like editor and seeing the page they created displayed on the front-end created a this is so cool type of energy from the users.

To test usability, learnability will be measured. A usability task will be completed 5 times with the task completion time recorded. 4 non-technical users and one technical user will execute the usability tasks 5 times each. A

non-technical user is an ordinary web surfer with no programming experience. A technical user is a user with significant programming experience.

3.6 Tasks

3.6.1 Logging in to back end

For this usability task the user will just execute a login by entering an email address and a password and clicking the login button.

Table 3: Logging into back end - Usability Testing

	1	2	3	4	5
userA	14.21s	13.91s	13.39s	13.72s	13.08s
userB	16.92s	16.00s	14.96s	15.06s	14.15s
userC	15.05s	16.11s	14.92s	13.93s	13.86s
userD	12.56s	25.26s	11.50s	11.00s	11.48s
userE	13.60s	12.30s	12.53s	13.16s	11.85s

Test data above clearly illustrates that the Learnability of the above task is high, meaning the new users find it easy to log into back end the first time they use the CMS since the time it took for new users to log into back end for the first time was only around 15 seconds.

3.6.2 Create basic user

For this usability task the user will execute a login, navigate to the Users Management page, create a basic user account by entering a predetermined email address, password and confirmation password and clicking the save button.

Table 4: Create basic user - Usability Testing

	1	2	3	4	5
userA	42.70s	41.80s	40.07s	37.33s	35.67s
userB	44.87s	44.06s	41.65s	39.20s	37.15s
userC	45.28s	42.87s	40.08s	41.95s	39.42s
userD	39.24s	31.91s	33.22s	29.43s	28.57s
userE	44.28s	50.87s	42.08s	39.95	40.42s

Test data above clearly illustrates that the Learnability of the above task is high since creating a basic user takes no more than 45 seconds for even the first time users. Considering that the "create basic user" task requires users to enter an email address, password, confirm the password and click save button, we can conclude that even with multiple steps involved in completing this task, the Learnibility is high since it only took around 45 seconds to complete.

3.6.3 Add user to administrators group and make user an active user(edit user)

For this usability task the user will execute a login, navigate to the users Management page, edit a user account by adding the account to the administrators group by selecting the administrators check box and making the user account active by selecting the yes select option.

Table 5: Edit user - Usability Testing

	1	2	3	4	5
userA	31.26s	30.74s	27.90s	27.98s	26.02s
userB	33.19s	31.26s	31.78s	29.69s	28.97s
userC	29.02s	27.85s	26.64s	26.09s	23.98s
userD	26.22s	24.16s	22.72s	21.33s	22.01s
userE	33.88s	31.03s	30.90s	29.83s	27.34s

Test data above clearly illustrates that the Learnability is high for the above task since it takes only about 30 seconds for even the first time users to edit user account.

3.6.4 Delete user

For this usability task the user will execute a login, navigate to the users Management page, and delete a predetermined user account by clicking the [x] button for the user account.

Table 6: Delete user - Usability Testing

	1	2	3	4	5
userA	31.91s	39.33s	30.22s	28.60s	25.94s
userB	26.87s	24.43s	24.21s	22.35s	21.82s
userC	29.06s	28.53s	26.72s	25.53s	22.92s
userD	20.09s	18.11s	17.48s	15.33s	16.50s
userE	25.03s	24.42s	22.65s	22.44s	21.01s

Test data above clearly illustrates that the Learnability of the above task is high since it takes around 30 seconds for even the first time users to delete user account. Considering that this task requires users to login, navigate to users management page and clicking a button to delete user, 30 seconds seems like very less time.

3.6.5 Add a page through Page editor

For this usability task the user will execute a login, create a new top level page by filling in the name and title input boxes with a predetermined name and title, by adding a predetermined image to the body of the web page, then click the "Insert Page Details" button on the "Common Details" tab.

Table 7: Add a page through Page editor - Usability Testing

	1	2	3	4	5
userA	46.14s	45.00s	42.72s	41.53s	40.95s
userB	49.80s	44.28s	42.94s	41.21s	39.73s
userC	45.75s	43.51s	42.74s	40.42s	41.24s
userD	38.04s	32.06s	34.62s	29.29s	28.92s
userE	42.75s	42.51s	39.74s	35.42s	34.24s

Test data above shows that the Learnability of the above task is high since it takes less than 50 seconds for even the first time users to add a page through page editor. Especially considering the fact that this task requires users to login, create top level page and clicking the insert page details button.

3.6.6 Add main page through page tree "add main page" button

For this usability task the user will execute a login, create a new main page by clicking the "add main page" button and filling in the name text box with a predetermined name, selecting the current date from the date picker from the create page dialog box.

Table 8: Add main page through page tree "add main page" button - Usability Testing

	1	2	3	4	5
userA	38.31s	35.83s	35.06s	33.11s	29.90s
userB	36.79s	35.63s	32.73s	30.36s	28.28s
userC	41.00s	39.60s	35.99s	33.52s	29.75s
userD	31.69s	23.96s	20.55s	21.54s	21.48s
userE	39.22s	36.68s	35.02s	34.08s	32.77s

Test data above shows that the Learnability of the above task is high since it only takes around 40 seconds to add a main page. Learnability of this task is high especially considering the fact that adding a main page is a task that requires multiple steps to complete.

3.6.7 Add child page through page tree context menu

For this usability task the user will execute a login, create a new child page by right clicking a top-level page and filling in the name text box with a predetermined name, selecting the current date from the date picker from the create page dialog box.

Table 9: Add child page through page tree context menu - Usability Testing

	1	2	3	4	5
userA	35.83s	33.89s	29.39s	30.63s	28.00s
userB	38.69s	36.54s	33.42s	33.20s	30.99s
userC	45.38s	41.34s	37.87s	36.04s	34.72s
userD	30.49s	26.67s	22.21s	24.12s	22.98s
userE	39.87s	36.67s	35.84s	32.37s	31.70s

Test data above clearly illustrates that the Learnability of the above task is high since it takes maximum 45 seconds for even the first time user to add

a child page through page tree context menu. Keeping in mind that adding a child page through page tree context menu is a task that requires multiple steps to complete. These steps include logging in, creating new child page by right clicking a top-level page, filling in the name text box and selecting the current date.

3.6.8 Edit a current page

For this usability task the user will execute a login, select a predetermined child page from the page menu tree, update the page title and insert an image into the page body in the page editor.

Table 10: Edit a current page - Usability Testing

	1	2	3	4	5
userA	39.51s	38.80s	35.36s	34.08s	35.41s
userB	39.71s	36.60s	35.19s	36.55s	33.48s
userC	40.18s	39.88s	37.57s	38.73s	36.82s
userD	34.34s	32.42s	32.47s	32.74s	29.34s
userE	42.89s	41.75s	39.43s	35.14s	36.88s

Above test data clearly illustrates that the Learnability of the above task is high since it takes around 42 seconds to complete even for the first time user. Thus even though "Edit a current page" is a task that requires users to login, select a predetermined child page, update the title page and insert an image into page body. It takes no more than 42 seconds to complete even for a first time user.

3.6.9 Delete a page

For this usability task the user will execute a login, select a predetermined child page from the page menu tree, then delete the page by right clicking and selecting delete from the context menu.

Table 11: Delete a page - Usability Testing

	1	2	3	4	5
userA	26.53s	26.27s	35.18s	25.78s	23.58s
userB	27.89s	26.64s	24.74s	25.31s	24.11s
userC	27.85s	25.85s	23.21s	24.90s	21.96s
userD	21.16s	18.27s	16.14s	16.40s	16.54s
userE	29.28s	26.62s	25.76s	22.05s	22.60s

Test data above indicates that the Learnability of the above task is high since it takes less than 30 seconds to delete a page even if the user is a first time user.

3.6.10 Change the theme of the site

For this usability task the user will execute a login, navigate the Theme Management Page, change the theme for the site by selecting the set theme button for the predetermined theme.

Table 12: Change the theme of the site - Usability Testing

	1	2	3	4	5
userA	21.12s	19.96s	17.92s	18.93s	18.19s
userB	20.40s	18.90s	18.67s	17.94s	17.85s
userC	22.03s	20.94s	21.25s	19.72s	18.05s
userD	17.80s	15.60s	14.04s	17.19s	14.25s
userE	20.14s	17.66s	17.71s	18.41s	16.50s

Test data above indicates that the Learnability of the above task is high since it takes no more than 22 seconds for even the first time users to change the theme of the site.

3.7 Traceability

3.7.1 Traceability to requirements

Table 13: Traceability to requirements - Usability Testing

Usability test	**Requirement #**
Logging into back end	2,5,3
Create basic user	2,5,6
Add user to administrators group and make user an active user (edit user)	2,5,7
Delete user	2,5,8
Add a page through page editor	10,11,13
Add a main page through page tree "add main page" button	10,11,13
Add child page through page tree context menu	10,11,13
Edit a current page	10,14
Delete a page	10,15

3.7.2 Traceability to modules

Table 14: Traceability to modules - Usability Testing

Usability test	**Module**
Logging into back end	Login
Create basic user	User Management
Add user to administrators group and make user an active user (edit user)	User Management
Delete user	User Management
Add a page through page editor	Page Management
Add a main page through page tree "add main page" button	Page Managment
Add child page through page tree context menu	Page Management
Edit a current page	Page Management
Delete a page	Page Management
Change the theme of the site	Theme Management

3.8 Changes made in response to Usability testing

- Added title to create page dialog
- Added emphasis to page creation feedback
- Added logout feedback
- Added the ability to change site template

4 Performance Testing

Since there are no large data sets to process, performance will be measured by the time to execute different tasks during typical CMS use.

4.1 Performance Tasks

4.1.1 Logging into back end

Logging in performance will be measured by adding the time to POST the user data to the server and to GET the html page from the server.

Table 15: Logging into back end - Performance Testing

POST	GET	Total
28 ms	29 ms	57 ms
18 ms	21 ms	39 ms
17 ms	23 ms	40 ms
17 ms	21 ms	38 ms

Test data above indicates that the performance is high for the above task since the total time to POST user data to the server and GET the html page from the server is no more than 57 ms.

4.1.2 Create basic user

Creating a basic user performance will be measured by recording the time to POST the user name, password, and confirmation password data to the server. There is no GET html processing time since the Create New User form posts to itself.

Table 16: Create basic user - Performance Testing

POST	GET	Total
69 ms	0 ms	69 ms
78 ms	0 ms	78 ms
89 ms	0 ms	89 ms
84 ms	0 ms	84 ms

Test data above indicates that the performance of the above task is high since the total time to POST the user name, password and confirmation password data to the server is no more than 89 ms.

4.1.3 Add user to administrators group and make user an active user(edit user)

Edit user performance will be measured by recording the time to POST the user name, updated groups field, updated active field data to the server. There is no GET html processing time since the Create New User form posts to itself.

Table 17: Add user to administrators group and make user an active user(edit user) - Performance Testing

POST	GET	Total
94 ms	0 ms	94 ms
98 ms	0 ms	98 ms
46 ms	0 ms	46 ms
88 ms	0 ms	88 ms

Test data above indicates that the performance of the the above task is high since the total time to POST the user name, updated groups field, updated active field data to the server is no more than 98 ms.

4.1.4 Delete user

Delete user performance will be measured by recording the time to GET the html page with deleted user gone from the User listing. There is no POST measurement time because the delete data is passed by a GET request

Table 18: Delete user - Performance Testing

POST	GET	Total
0 ms	75 ms	75 ms
0 ms	74 ms	74 ms
0 ms	106 ms	106 ms
0 ms	51 ms	51 ms

Test data above indicates that the performance of the above task is high since it takes at max 106 ms to GET the html page with deleted user gone from the user listing.

4.1.5 Add a page through Page editor

Add a page through Page editor performance will be measured by recording the time to POST the new page data to the server. There is no GET html processing time since the Insert new page form posts to itself.

Table 19: Add a page through Page editor - Performance Testing

POST	GET	Total
72 ms	0 ms	72 ms
74 ms	0 ms	74 ms
55 ms	0 ms	55 ms
60 ms	0 ms	60 ms

Above data indicates that the performance of the above task is high since the time to POST the new page data to the server is no more than 74 ms.

4.1.6 Add main page through page tree add main page button

Add main page through page tree "add main page" button performance will be measured by recording the time to POST the new page data to the server from the create page dialog. There is no GET html processing time since the create page dialog posts to itself.

Table 20: Add main page through page tree add main page button - Performance Testing

POST	GET	Total
103 ms	0 ms	103 ms
97 ms	0 ms	97 ms
99 ms	0 ms	99 ms
135 ms	0 ms	135 ms

Above data indicates that the performance of the above task is high since it takes at max 135 ms to POST the new page data to the server from the "create page dialog".

4.1.7 Add child page through page tree context menu

Add child page through page tree context menu performance will be measured by recording the time to POST the new page data to the server from the "create page dialog". There is no GET html processing time since the create page dialog posts to itself.

Table 21: Add child page through page tree context menu - Performance Testing

POST	GET	Total
106 ms	0 ms	106 ms
129 ms	0 ms	129 ms
105 ms	0 ms	105 ms
131 ms	0 ms	131 ms

Above data indicates that the performance for the above task is high since the time it takes to POST the new page data to the server from the "create page dialog" is no more than 131 ms.

4.1.8 Edit a current page

Edit a current page performance will be measured by recording the time to POST the updated page data to the server from the page editor form. There is no GET html processing time since the page editor form posts to itself.

Table 22: Edit a current page - Performance Testing

POST	GET	Total
138 ms	0 ms	138 ms
115 ms	0 ms	115 ms
103 ms	0 ms	103 ms
111 ms	0 ms	111 ms

Above data indicates that the performance for the above task is high since the time it takes to POST the updated page data to the server from the editor form is at max 138 ms.

4.1.9 Delete a current page

Delete a current page performance will be measured by recording the time to GET the new page from the server without the deleted data displayed.

Table 23: Delete a current page - Performance Testing

POST	GET	Total
0 ms	21 ms	21 ms
0 ms	24 ms	24 ms
0 ms	25 ms	25 ms
0 ms	33 ms	33 ms

Above data indicates that the performance of the above task is high since the time it takes to GET the new page from the server without the deleted data displayed is no more than 33 ms.

4.2 Traceability to requirements

Table 24: Traceability to requirements - Performance Testing

Performance Test	**Requirement #**
Logging into back end	2,5,3
Create basic user	2,5,6
Add user to administrators group and make user an active user (edit user)	2,5,7
Delete user	2,5,8
Add a page through page editor	10,11,13
Add main page through page tree "add main page" button	10,11,13
Add child page through page tree context menu	10,11,13
Edit a current page	10,14
Delete a page	10,15

4.3 Traceability to modules

Table 25: Traceability to modules - Performance Testing

Performance Test	**Module**
Logging into back end	Login
Create basic user	User Management
Add user to administrators group and make user an active user (edit user)	User Management
Delete user	User Management
Add a page through page editor	Page Management
Add main page through page tree "add main page" button	Page Management
Add child page through page tree context menu	Page Management
Edit a current page	Page Management
Delete a page	Page Management

5 System Tests

This section of the document presents the system tests that were conducted on our CMS.

5.1 Automated testing

Automated testing was used to unit test our Page class, which is the most important class for our CMS.

5.2 testGetInstance()

see PageTest.php attachment

- This test tests the Page::getInstance() method of the Page class by creating a Page object by using the getInstance() method with id=19, which is the id of a test page created for testing. Each property is assertEqualed against the values in the database for the test page. The body property is not tested due to the size of the body property, which is the web page content. The vars property is also not tested due to the size of vars, which is a huge array.
- The initial state for the testGetInstance() test can be found by documenting the second argument of the assertEquals method as the property, and the first argument of the assertEquals method as the value of that property.

5.3 testGetInstanceByName()

see PageTest.php attachment

- This test tests the Page::getInstanceByName() method of the Page class by creating a Page object by using the getInstanceByName() method with name=test page, which is the name of the test page created for testing. Each property is assertEqualed against the values in the database for the test page. The body property is not tested due to the size of the body property, which is the web page content. The vars property is also not tested due to the size of vars, which is a huge array.

- The initial state for the testGetInstanceByName() test can be found by documenting the second argument of the assertEquals method as the property, and the first argument of the assertEquals method as the value of that property.

5.4 testGetInstanceBySpecial()

see PageTest.php attachment

- This test tests the Page::getInstanceBySpecial() method of the Page class by creating a Page object by using the getInstanceBySpecial() method with special=1, which is the value given to the home page. Each property is assertEqualed against the values in the database for the home page. The body property is not tested due to the size of the body property, which is the web page content. The vars property is also not tested due to the size of vars, which is a huge array.

- The initial state for the testGetInstanceBySpecial() test can be found by documenting the second argument of the assertEquals method as the property, and the first argument of the assertEquals method as the value of that property.

5.5 testGetRelativeURL()

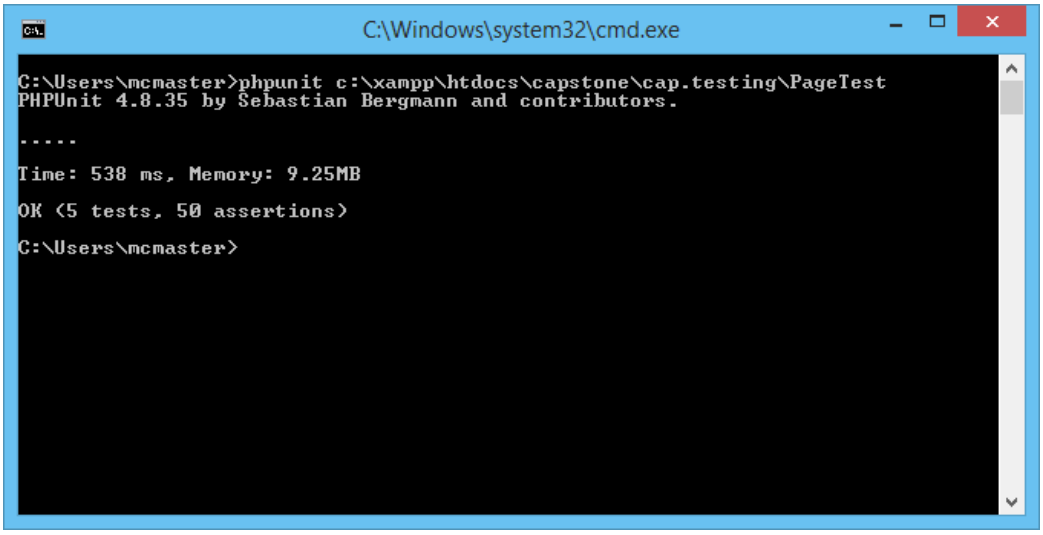
see PageTest.php attachment

- This test tests the Page::getRelativeURL() method of the Page class by creating a Page object of a child page so the parent can be listed in the relative URL output in the format /parent/child.

5.6 testGetURLSafeName()

see PageTest.php attachment

- This test tests the Page::getURLSafeName() method of the Page class by creating a page object of a page with a space in the name so the name can be transformed into a safe name $"pagename" \Rightarrow" page-name"$.



5.7 Traceability

5.7.1 Traceability to requirements

Table 26: Traceability to requirements - System Testing

Unit Test	Requirement #
testGetInstance()	1,11,12,13,14
testGetInstanceByName()	1,11,12,13,14
testGetInstanceBySpecial()	1,11,12,13,14
testGetRelativeURL()	1
testGetURLSafeName()	1

5.7.2 Traceability to modules

Table 27: Traceability to modules - System Testing

Unit Test	Module
testGetInstance()	Page Management
testGetInstanceByName()	Page Management
testGetInstanceBySpecial()	Page Management
testGetRelativeURL()	Page Management
testGetURLSafeName()	Page Management

5.8 Changes made in response to system tests

- A few bugs were discovered and corrected in the Page Management system.