Test Report for Quarters

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Revision History

Date	Comments
March 20, 2016	Created first draft.

1 Introduction

This testing report shows the results of both system tests and non-functional tests on the Quarters application. The system tests are reported based on each individual module. Non-functional tests included tests on usability, performance and robustness.

2 Automated Testing

Automatic testing is being used in this project to unit test various parts of the system. The project's components are broken up into several parts: Client-side JavaScript components, Server-side access and security.

The client side JavaScript is tested every week once a week on an alternate web server using QUnit, a JavaScript unit-testing framework. Unit tests were written for each component to ensure every method does their intended action. The unit tests are rigorously tested to ensure all exceptions are handled.

Server Side access is tested via a Python web crawler. To ensure that ever page is reachable. This is run once a week similarly to the client-side tests. The web crawler also crawls through all available link in a demonstration and checks for broken links. Security also tested within the web crawler by crawling with authentication and without authentication. A predetermined set of pages can only be accessible with out authentication such as the landing page, login and registration.

The unit tests will be updated and modified as more development continues. In practice, these unit tests should ensure that updates to the code base and other changes to the server end do not break the system.

3 System Tests

In this section the test cases carried out on each individual module are described. Trivial cases for some modules are not explicitly written out but instead described at a high level. Additional details are provided when necessary.

[Are the numbers in your tests supposed to be requirement mappings? Make that explicit. —DS]

3.1 User Registration

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
1.1	User Registration	Landing page. Empty fields.	Email and password entered. Clicks register.	Redirected to application main page.	As expected.	PASS
1.2	User Registration	Landing page. Empty fields.	Empty field(s). Clicks register.	Stays on the same page. Error message appears. Empty field is highlighted.	As expected.	PASS
1.3	User Registration	Landing page. Empty fields.	Email address already stored in database. Clicks register.	Stays on the same page. Error message appears. Email field is highlighted.	As expected.	PASS

3.2 User Login

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
2.1	User Login	Landing page. Empty username and password fields.	Valid username and password combination. Clicks login.	Redirected to application main page.	As expected.	PASS
2.2	User Login	Landing page. Empty username and password fields.	Invalid username and password combination. Clicks login.	Stays on the same page. Error message appears. Fields are highlighted. After 5 unsuccessful attempts, user cannot login for 10 minutes.	As expected.	PASS
2.3	User Login	Landing page. Empty username and password fields.	Empty username and/or password fields. Clicks login.	Stays on the same page. Error message appears. Fields are highlighted.	As expected.	PASS

2.4	User Logout	Application main page.	Clicks logout.	User is successfully logged out from system. Redirected to login page.	As expected.	PASS
2.5	User Login	Landing page. Empty username and password fields. User attempting to login on another device while already logged in on a device.	Valid username and password combination. Clicks login.	Stays on the same page. Error message appears.	As expected.	PASS

3.3 Calendar

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
3.1-3.4	Add event to Calendar.	Calendar page.	User selects date to add new event, enters information, clicks save.	Modal opens with fields, and closes upon save. Event is updated correctly on Calendar. The same output results if user selects existing event to modify.	As expected.	PASS

3.5	Delete event from Calendar	Calendar page.	User selects event to delete, clicks delete.	Modal opens with fields. Upon clicking delete, the modal closes and the event is removed from the Calendar.	As expected.	PASS

3.4 Maintenance Tracking

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
4.1-4.5	Navigating to maintenance page	Quarters application.	User clicks on maintenance tab in the navigation bar	Application navigates to maintenance page, all maintenance tickets relevant to the house are shown	As expected	PASS
4.6	Delete ticket from maintenance page	Maintenance System.	User clicks on ”X” button beside the maintenance ticket, user clicks confirm when confirmation window pops up.	confirmation window will appear. upon deletion conformation, close confirmation window, and ticket is removed from the page.	As expected	PASS
4.7-4.12	Create new maintenance ticket	Maintenance System.	User clicks on ”new request”.	Modal opens with fields, and closes upon save. New ticket is added into the page	As expected	PASS

3.5 House Management

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
5.1	Modify house information, not admin.	House Management, not admin.	Click modify information.	Nothing.	As expected.	PASS
5.2	Modify house information as admin.	House Management, admin.	Click modify information.	Input fields become editable.	As expected.	PASS
5.3	Modify house information as admin.	House Management, admin.	Modify information fields.	Save button opens, discard changes appears.	As expected.	PASS
5.4	Modify house information as user.	House Management, any user.	Click on View Documents.	Redirects to new page showing all uploaded documents in House.	As expected.	PASS
5.5	Modify house information as user.	House Documents, any user.	Clicks on a document.	Retrieves documents and initiates file transfer.	As expected.	PASS
5.6	Modify house information as admin.	House Documents, admin.	Clicks on Add Documents.	Upload window opens for user upload, file will be transfer to server and information is updated in database.	As expected.	PASS
5.7	Modify house information as admin.	House Documents, admin.	Clicks on delete document.	Prompt opens.	As expected.	PASS

5.8	Modify house information as admin.	Deletion prompt, admin.	Clicks on yes.	Prompt closed, file is removed from display, database is updated.	As expected.	PASS
5.9	Modify house information as admin.	Deletion prompt, admin.	Clicks on no.	Prompt closed.	As expected.	PASS
5.10	Modify house information as user	House Management, any user.	Clicks on view members.	Shows all members of the house and their role.	As expected.	PASS
5.11	Modify house information as admin.	House Management, admin, members list visible.	Clicks on add member.	Dialog will appear.	As expected.	PASS
5.12	Modify house information as admin.	Member Dialog, admin, fields empty.	Clicks on ok.	Prompt opens, notifying missing fields.	As expected.	PASS
5.13	Modify house information as admin.	Member Dialog, admin, fields complete.	Clicks on ok.	Window closes, new user is notified, database is updated, member status pending.	As expected.	PASS
5.14	Modify house information as admin.	Member Dialog, admin.	Clicks on cancel.	Window closes.	As expected.	PASS

3.6 Landing Page

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
6.1,6.2	Access login or registration.	Not logged in.	Clicks on login.	Modal opens and email and password fields appear. The same output results if user clicks on register.	As expected.	PASS

3.7 Finance

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
7.6	Add a new bill to the house	Finance page	User clicks on “+” button, fills in all required information in modal window and click ”save”	Modal window opens with fields, upon save with all fields filled in, a list of tenants that owes the user money will be added to the page	As expected.	PASS
7.7	Mark bill as paid	Finance page	User clicks on “Paid” button beside the bill, clicks ok on the confirmation window	Confirmation window will appear, upon clicking ok, the bill will have a ✓beside it	As expected.	PASS

7.8	Delete bill	Finance page	User clicks on “Delete” button beside the bill, clicks ok on the confirmation window	Confirmation window will appear, upon clicking ok, the bill will be deleted from the page	As expected.	PASS

3.8 Notifications

No.	**Test Case**	**Initial State**	**Input**	**Expected Output**	**Actual Output**	**Result**
8.1-8.15	User Logs in	Quarters	no input required	Number of unread notifications is displayed	As Expected	PASS
8.16	Viewed Notification	Quarters	viewed notifications	notification count is cleared	As expected	PASS
8.17	Clicking on notification	Quarters	click on notification	brings up updated post	As expected	PASS

3.9 File Storage

No.	**Test Case**	**Initial State**	**Input**	**Expected Output**	**Actual Output**	**Result**
9.1	File Upload	0 files in storage.	User tries to upload a file of size s, where $s \leq$ max file size.	Successful file upload.	As expected.	PASS
9.2	File Upload	0 files in storage.	User tries to upload a file of size s, where $s >$ max file size.	Error message indicating file has not been uploaded.	As expected.	PASS

9.3	File Upload	n files in storage.	User tries to upload a file of size s, where $s \leq$ total remaining space.	Successful file upload.	As expected.	PASS
9.4	File Upload	n files in storage.	User tries to upload a file of size s, where $s >$ total remaining space.	Error message indicating file has not been uploaded.	As expected.	PASS
9.5	File Upload	n files in storage.	User tries to upload a file with an invalid type.	Error message indicating file has not been uploaded.	As expected.	PASS
9.6	File Download	n files in storage.	User requests to download a file.	Successful file download.	As expected.	PASS
9.7	File Download	n files in storage.	Connection interrupted while download is in progress.	Error message indicating file has not been downloaded.	As expected.	PASS
9.8	File Upload	n files in storage.	User tries to upload $n > 1$ files.	Error message indicating only one file can be uploaded at a time.	As expected.	PASS
9.9	File Delete	n files in storage.	User clicks delete file.	File removed.	As expected.	PASS

3.10 Bulletin Board

No.	Test Case	Initial State	Input	Expected Output	Actual Output	Result
10.2-10.6	Open Bulletin Board	In quarters	opening action	latest 15 posts are displayed	As expected	PASS
10.7	Adding a post	Bulletin Board	Data for the new post is added; text, or files	Posts is added to the database, and displayed on the board	As expected	PASS
10.8	Adding sub-reply	Bulletin Board	text reply for a comment	Reply added to the database, and displayed under the post	As expected	PASS
10.9-10.10	Removing post, sub-reply	Bulletin Board	request for removing a post, subreply	reply is deleted from database and from display	As expected	PASS

4 Non-Functional Tests

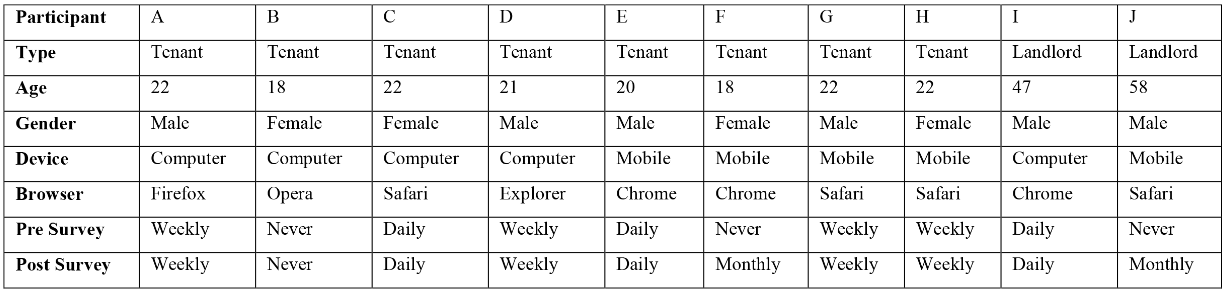
4.1 Usability

The usability of Quarters was evaluated by asking test participants to complete a pre-defined task, as well as a pre- and post-test questionnaire, as outlined in the Test Plan. The participants' performance was measured by the total time to complete the task. The average time of all participants to complete the task on Quarters was measured. Think-aloud results provided subjective feedback on the user experience of Quarters. The post-questionnaire provided subjective feedback on Quarters itself.

4.1.1 Results

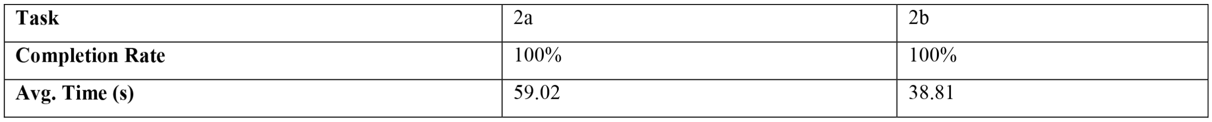
Figure 1 shows the participants. This data was collected during Task 1. The task completion rate was 100% for both tasks 2a and 2b, and the average times were both less than 60 seconds. Therefore the success metric stated in the Test Plan was met for completion rate and completion time, as shown in Figure 2. Figure 3 illustrates the results from Task 3. The average response rating for each question is shown.

[You should make all of your tables in LaTeX to ensure a consistent style. —DS]



Participant	A	B	C	D	E	F	G	H	I	J
Type	Tenant	Tenant	Tenant	Tenant	Tenant	Tenant	Tenant	Tenant	Landlord	Landlord
Age	22	18	22	21	20	18	22	22	47	58
Gender	Male	Female	Female	Male	Male	Female	Male	Female	Male	Male
Device	Computer	Computer	Computer	Computer	Mobile	Mobile	Mobile	Mobile	Computer	Mobile
Browser	Firefox	Opera	Safari	Explorer	Chrome	Chrome	Safari	Safari	Chrome	Safari
Pre Survey	Weekly	Never	Daily	Weekly	Daily	Never	Weekly	Weekly	Daily	Never
Post Survey	Weekly	Never	Daily	Weekly	Daily	Monthly	Weekly	Weekly	Daily	Monthly

Figure 1: Task 1 Pre-Questionnaire Responses.



Task	2a	2b
Completion Rate	100%	100%
Avg. Time (s)	59.02	38.81

Figure 2: Average time for Task 2.

4.1.2 Discussion

The usability evaluation proved there were many positive aspects of the Quarters user interface. Every participant was able to complete their task, and in an efficient time, regardless of the browser or the device. The straightforward navigation of the application allowed the participants to navigate easily across the web application and communicate quickly, which is a high-level goal of the software. The questionnaire results showed that participants agreed that Quarters was easy and intuitive to use. Based on these usability results, one could infer that the design and implementation support Normans Design Principles, as discussed in the Detailed Design document. The participants of the usability test unanimously strongly agreed that they would use the Maintenance Ticketing, File Upload and Notifications features. After testing Quarters, in response to how frequently they would use Quarters, participants either did not change their mind, or said they would use it more frequently relative to what they had stated prior to testing Quarters. Several participants noted during the talk-aloud that they could see Quarters solving a lot of issues they experience in their current households. These positive test results prove that Quarters has marketability.

Quarters was not without its weaknesses though. Not every participant saw the value in using Quarters on a daily basis and not every participant would recommend Quarters to a friend. Additionally, Quarters performed poorly on questions 5 and 6, which tested the usability of the Chat feature and the Finances feature, respectively. Participants noted during the talk-aloud that they could not see a use for the Chat feature when the Bulletin Board allowed them the same functionality. Additionally, they noted that the purpose of the Finances feature was not initially clear. One landlord noted that they saw value in the File

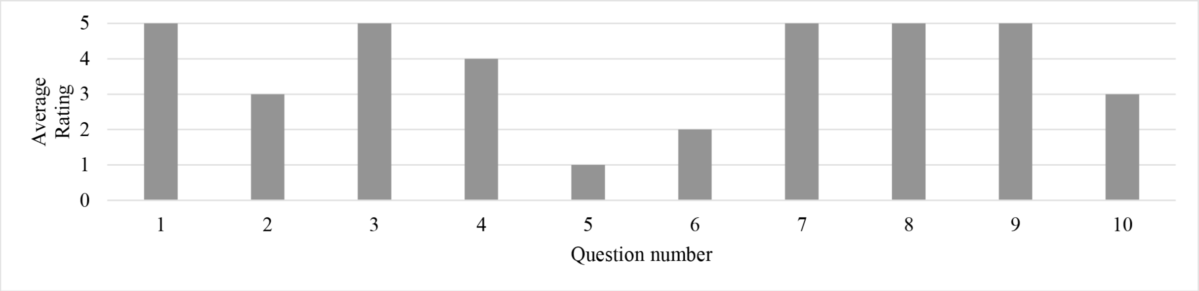


Figure 3: Task 3 Post-Questionnaire Responses.

Upload feature, but not so much in the other features. Lastly, some users with a keen eye for design noted some glitches or flaws in our interface.

4.2 Performance

To load test our server, we used the free trial of Load Impact(loadimpact.com) to simulate 25 users making requests to the server simultaneously; result is shown in 4.
From the graph, you can see that the load time is fairly consistent as the number of users increase.

4.3 Robustness

Quarters application is tested against various browser and hardware devices to ensure that it will work in all environments.

Browser	**Device**	**Look and feel**	**Functionalities**	**Bugs**
Edge	Computer	As expected	As expected	None
Firefox	Computer	As expected	As expected	None
	Android	As expected (Auto resize)	As expected	None
	iOS	As expected (Auto resize)	As expected	None
Chrome	Computer	As expected	As expected	None
	Android	As expected (Auto resize)	As expected	None
	iOS	As expected (Auto resize)	As expected	None
Opera	Computer	As expected	As expected	None
	Android	As expected (Auto resize)	As expected	None
	iOS	As expected (Auto resize)	As expected	None
Safari	Computer	As expected	As expected	None
	iOS	As expected (Auto resize)	As expected	None

Permission: When the user logs in and select a house, he is assigned a role(admin/member), each role has different permissions, for example, only admin can invite new members into the house. In additional to having different roles, the user can only edit/delete "contents" owned by himself.

Session time out: Session timed out after 30 minutes of inactivity, in which the user is logged out.

[Something is wrong with your margins. The page number is overwriting text. —DS]

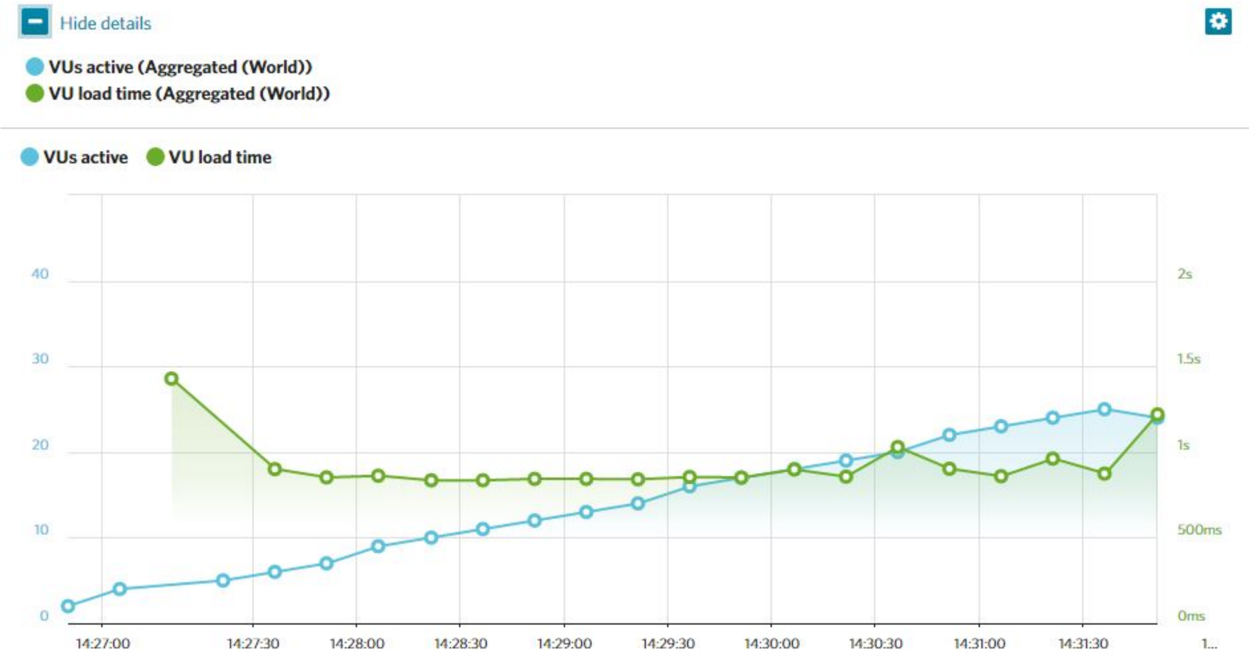


Figure 4: Load Test result

5 Summary of Changes

Moving forward, there is room for improvement with regard to the non-functional tests. Removing the Chat feature is something to consider to ensure all of our features collectively integrate well into Quarters. Redesigning the Finances feature or adding more functionality to it may help users understand its purpose more intuitively. Devoting more time and focus to styling would help resolve any design concerns and give the interface a more polished and professional appearance. Hopefully, with these changes, more participants would consider using Quarters more frequently and recommending the application to a friend. The results of the usability test have low external validity; in future usability tests, it would be worthwhile to seek a more diverse testing population outside of a school setting, with more landlords participating. Furthermore, a more complex set of tasks for test participants could give a more accurate reading of the effectiveness and efficiency of our application.

[So what exactly did you / are you planning to change? —DS]