

App for Student Group Project Management & Coordination

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# 1. Introduction

Room Raider is a student group project coordination and management app for smartphones currently under development by Hop-Scotch Mafia. The app provides facilities for students to create study groups in the app, communicate with study group members, and arrange meetings through a room booking interface. A prototype for Room Raider has been developed with those features implemented using hard-coded data and a software prototyping system. This report details the first iteration of prototype user evaluations for Room Raider. A team of 5 Hop-Scotch Mafia developers acted in the capacity of researchers and evaluation invigilators for this study.

# 2. Objectives

The purpose of the prototype evaluation for Room Raider is to obtain information regarding the app’s efficacy in completing tasks, its usability, and its depth of functionality. In order to procure this information, the following objectives were identified for the evaluation:

* Identify and mitigate any issues which caused use of the app to be inefficient or slow
* Ensure that the interface is intuitive and usable by a varied user group
* Identify aspects of the interface which are not aesthetically pleasing to users
* Find ways of improving the app’s user experience

The prototype used in the study was a simulation of smartphone (Android) software and hardware using prototyping software and PC hardware. The prototype was fairly high-fidelity with shallow functionality implementation.

# 3. Methodology

The prototype evaluation for Room Raider aimed to yield consistent data by controlling several research parameters. Participants were asked to perform the same tasks on similar hardware simulating the app using shallow prototyping.

## 3.1 Evaluation Participants

Each of the 5 Room Raider researchers found one potential user to participate in the prototype evaluation. As the app is designed to be used specifically by UVic students, only current and former UVic students were considered eligible for participation in the evaluation. In order to glean the most accurate information, students of several faculties were chosen as participants. Faculties represented were engineering, arts, and science. Of the 5 participants, 3 were female and 2 male, with ages ranging from 20 to 29 years. All participants chosen possessed some degree of fluency with computers and smartphones.

## 3.2 Tasks Evaluated

Each participant was tasked with 8 tasks, each of which test different aspects of Room Raider’s functionality and interface. The list of tasks given to each participant is as follows:

1. *Register a username and password with the system, then log out*
2. *Log in to the system*
3. *From the main page, create a group*
4. *Once the group has been created, add users to “Some group I own”*
5. *From the main page, simulate chat with users in the CSC 225 group*
6. *From the main page, search for the URL sent by Jim on December 1st, 2015*
7. *From the main page, book a study room for February 29th, 2015 from 7:00 to 9:20 in ECS 116*
8. *From the main page, delete the group called “some other group”*

Further information regarding these tasks can be found in §7.2.

## 3.3 Evaluation Setting and Equipment

Each participant was placed in a quiet environment free from distractions. The equipment used for evaluations was a personal computer or laptop (depending on what each researcher had at their disposal) which ran a prototype application simulating Room Raider. Users interacted with this prototype application using a mouse to simulate touchscreen functionality of a smartphone.

## 3.4 Evaluation Procedure

The evaluation procedure contained two parts, one designed to obtain quantitative data, and one designed to obtain qualitative data. The procedure involved both co-discovery and questionnaire techniques for information gathering.

1. The first part of the evaluation gathered data regarding participants’ efficiency and user experience when performing the 8 tasks listed in §3.2.
2. The second part of the evaluation utilized a questionnaire (which can be found in §7.2) to elicit participants’ opinions regarding the efficacy and usability of the app. The questionnaire also aimed to gather further data regarding user experience.

Before each evaluation session, the participant read and signed a consent form (which can be found in §7.1). At the start of each evaluation session, time of day was recorded, after which the participant was given access to the prototype application. Participants were not given any practice with the application prior to evaluation in order to not taint the resultant data. The developer, acting as invigilator, then gave the participant each task listed in §3.2 and recorded the time required for completion of each task, as well as data outlined in §3.5.

## 3.5 Data Collected

Quantitative data collected during evaluations included

* the time participants needed to complete each task listed in §3.2
* the number of times the participant expressed frustration or distress during completion of each task listed in §3.2, and
* whether each task listed in §3.2 task was successfully completed by the participant.

A pseudo-quantitative datum was collected by asking each participant to rate the usability of Room Raider on a scale of 1-10. Qualitative data was collected by asking each participant to answer 3 open-ended questions (these questions can be found in §7.2).

# 4. Results

The prototype evaluation of Room Raider yielded both quantitative and qualitative data regarding the usability, efficacy and user experience of the app.

## 4.1 Quantitative Results

The prototype evaluation of Room Raider yielded the following quantitative data:

* Average times taken to complete each task, which produced a ranking of task completion times:

1. Log in (5.4 seconds)
2. Chat (7.8 seconds)
3. Create group (16.0 seconds)
4. URL search (18.4 seconds)
5. Delete group (25.8 seconds)
6. Register username and password (30.2 seconds)
7. Book a room (35.6 seconds)
8. Add users to group (38.4 seconds)

* The number of times a participant erroneously pressed the back button during a task. The highest count for any task was only 2, and the averages for each task was less than 0.5.
* The number of times a participant expressed frustration or distress during a task. The highest count for any task was 14, which skewed the data as counts for all other tasks and participants was considerably lower. The average count for adding users to a group was 2.8, while the averages for all other tasks was less than 1.
* Success rate for all participants on all tasks was 100%.
* The average usability rating among all participants was 7.4/10.
* The average time required for an evaluation was 16 minutes.

## 4.2 Qualitative Results

Qualitative data yielded from the open-ended questions asked during the prototype evaluations indicated that 80% of participants enjoyed using the Room Raider interface. Issues identified by participants included

* frustration with the hard-coded nature of the shallow prototype application used
* some expected smartphone interface functionality was not present in the prototype, such as scrolling
* a lack of indication of group member activity/inactivity
* difficulty pressing buttons in the prototype application, and
* the colour scheme was found to be depressing and button colours were found to be confusing.

# 5. Discussion

The prototype evaluations for Room Raider provided some useful and illuminating information. Analysis of this data is necessary to further evaluate the efficacy, depth of functionality, and user experience of Room Raider.

## 5.1 Assumptions

A number of assumptions were made before undertaking this study. Firstly, the developer group conducting the research assumed that all evaluation participants would have some degree of familiarity with personal computers, smartphones, and software commonly found on both platforms. Secondly, as the participants of the prototype evaluations would consist of University of Victoria students and alumni, all participants should have some exposure to the current system for room booking at UVic.

## 5.2 Limitations

One obvious limitation of the study was the small sample of potential users participating in the study. While much useful data was yielded from the 5 participants, a clearer picture of the efficacy, functionality, and user experience would be yielded from a much larger test sample. Another limitation encountered was the prototype itself, as deep prototyping such as prototype code was not a viable option given time and manpower constraints. While most functionality and interface aspects of the application were represented with the prototype, the aspects which were not present caused some confusion and distraction for participants. The limited nature of the prototype also gave an incomplete picture of the overall user experience of the app.

## 5.3 Attainment of Objectives

The prototype evaluation study in general met all the objectives listed in §2. Few issues were identified that affected the user’s ability to quickly and efficiently use the app. The interface was found to be fairly intuitive as the data was consistent across the participants with few outliers. Participants readily provided information regarding the aesthetics of the interface. Finally, the open-ended questions yielded multiple suggestions for improving user experience.

## 5.4 Areas for Improvement

The prototype evaluations highlighted a number of usability issues with the Room Raider prototype. All of the issues identified are fixable through making changes in the current prototype or by developing a more comprehensive prototype.

The first issue identified was the non-intuitive *add users* task. One participant found this task particularly frustrating and while they were able to complete the task, it took much longer than other tasks. After analysis of the task, it was determined that the ambiguous group management page was the primary factor behind the difficulty experienced by participants. To finalize adding users to a group, the user must press the “send invitations” button. This issue could be rectified by changing the “send invitations” button to say “add users” followed by a pop-up dialog prompting the user to send email invitations to the users they wish to add to the group.

The second issue identified by participants regarded the log-out button. Participants did not associate the icon of a man running out a door (ie. an exit sign) to be a log-out button. This issue is easily rectified by changing the log-out button to be a simple round button with the words “log out” on the button.

The next issues identified were aesthetic in nature. Participants found the colour scheme of the app to be dark and depressing. Furthermore, participants found the colour scheme applied to the buttons to be confusing as at least 5 different colours were used for buttons. This issue could be addressed through the application of a consistent colour scheme using shades of 2 or 3 different colours. Further evaluation iterations using A/B testing could be used to identify colour schemes that are aesthetically pleasing to users.

For the next iteration of prototype evaluations, these issues will be addressed using high-fidelity prototype code which implements more functionality and incorporates the changes outlined above.

# 6. Conclusion

This first round of prototype evaluations for Room Raider has yielded promising results. The data obtained from this study were illustrative and all the objectives of the study were met. Potential users for the most part enjoy using Room Raider and found the app to be usable. While the issues identified need addressing before the app can be put into production, or even beta testing, the next iteration of prototype evaluations will rectify these issues. Fortunately, no severe usability issues were identified, and all tasks were completed by participants.

# 7. Appendix

## 7.1 Prototype Evaluation Consent Form

**Consent Form**

**For Participation in the Study Entitled:**

**“Designing and Evaluating a Study Group Application”**

You are being invited to participate in a study entitled *Designing and Evaluating a Study Group Application*that is being conducted byHop-Scotch Mafia. You may contact Konrad Schultz by email at schultzk@uvic.ca if you have further questions.

The purpose of this research project is to design and evaluate the user interface of a simple group forming application. You will be interviewed about your previous experiences with study groups and the tools you used to communicate.

You will be asked to answer a series of questions about your experience with group study, How often you work in groups, the applications you like, and new features you would like to have. Your participation should require about 10 minutes of your time. The results will be reported in a project report for SENG 310 in the Faculty of Engineering at the University of Victoria.

Your participation is completely voluntary and you can withdraw from the study at any time, without explanation. You have the right to refuse to answer **any** questions for any reason.

Any data collected in the study will remain confidential; interview results and questionnaires will be kept in a locked filing cabinet in a locked office. Only the principal

and co-investigators (Jim Galloway and Jakob Roberts) will have access to the data. Your name will not be attached to any published results, and your anonymity will be protected by using code numbers to identify results obtained from individual subjects.

Whether you participate or choose not to participate will have no bearing on your

grade / employment status / academic standing / job / services received.

**Signature of participant: Researcher:**

**Date: Phone:**

***A copy of this consent will be left with you, and a copy will be taken by the researcher.***

## 7.2 Prototype Evaluation Template

Name of Participant: \_\_\_\_\_\_\_\_\_\_\_\_\_ Age: \_\_\_\_\_ M / F Start time:

Name of Researcher: \_\_\_\_\_\_\_\_\_\_\_\_\_ End time:

**STAGE ONE: Tasks to complete**

*Each task should be performed starting from the specified start screen. All input is simulated.*

1. Register a username and password with the system, then log out.

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

2. Log in to the system.

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

3. From the main page, create a group (Study group #256).

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

4. Once the group has been created, add users to “**Some group I own**”.

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

5. From the main page, simulate chat with users in **CSC 225.**

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

6. From the main page, search for the URL sent by **Jim** on **December 1st, 2015.**

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

7. From the main page, book a study room for **February 29th, 2015** from **7:00 to 9:20** in **ECS 116.**

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

8. From the main page, delete “**some other group**”.

*Time to complete: \_\_\_\_*

*Number of times back button was used (in error):*

*Number of times the participant expresses distress:*

*Success Failure*

**STAGE TWO: Follow up questions**

**(don’t forget to get them to sign the consent form)**

1. “On a scale of one to ten, how would you rate Room Raider on its usability?”

1 2 3 4 5 6 7 8 9 10

2. “Did you enjoy using Room Raider? Why/why not?”

3. “What did you like about Room Raider’s UI? What didn’t you like?”

4. “Were there any problems that you encountered while performing a task? What were they?

What task were you performing at the time?”