

Project Evaluation Plan

Group 5: Bar Application

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Abstract— Upon completion of this research plan an analytical and empirical study shall be completed. The analytical study should identify usability problems in context of a first time user. This will allow for these issues to be corrected before an actual user tests the application. Then the empirical study will work with an intoxicated user to identify additional usability issues and should allow the application to be tailored to their needs.

Keywords—Usability Engineering, Evaluation, Application

I. INTRODUCTION

The bar application prototype to be evaluated was developed with the intent of offering a more complete and engaging bar experience. The application aims to provide options for food and drink ordering, payment types, and entertainment. Food and drink ordering allows for quicker service and the ability to reorder instantly. Payment options gives the user the ability to split the bill with other patrons and pay from the table. Lastly, entertainment features enable the user to play single-player games or multi-player games, including table wide or bar wide games. The features built into this application aim to enhance the general experience as well as the social engagement between patrons. The development of the prototype was based on user insights gained from field interviews conducted across North America. The next design phase of this prototype is the evaluation phase, in which analytical and empirical research will be conducted.

II. OVERALL RESEARCH GOALS

The purpose of this research is to evaluate the prototype designed for a bar application. The main objectives include maximizing efficiency, learnability, and engagement. Specifically, the prototype will be examined for:

- Unexpected user interface design issues such as incorrect links;
- Ease of use in respect to navigation and functionality;
- Learnability in a casual setting without the need for extensive training and
- Determination of the impact of intoxication on the use of the prototype.

III. ANALYTICAL RESEARCH

A. Research Goals

During the course of the research, the research team intends to test the full functionality of the application. This is to ensure that the application delivers all of its intended uses in an efficient manner. The goal of the research is to understand what the application is going to do, how easily the application can be navigated through, and how feedback will be given to aid in understanding usability of the application. In summary, the research goals are to:

- Determine the functionality of the app by testing the:
 - ordering systems
 - entertainment functions
 - billing functions
 - call waiter function
- Observe the visibility of functions
- Test feedback systems within the application
- Create qualitative analysis of a typical user and a typical task.

B. Research Plan

There are three analytical evaluation models: The GOMS/KLM model measures how long tasks take to complete. The heuristic model examines the application's flow and details. The cognitive walkthrough model examines whether users can recognize how to accomplish tasks at each step of the application. The cognitive walkthrough is more thorough than the heuristic model and better suited than GOMS/KLM to test an application used by infrequent, first time or impaired users. Each team-member will conduct a cognitive walkthrough of the prototype, recording concerns. Analytical research will be performed before empirical research to minimize the number of issues that reach the test user.

The analytical research plan shall be conducted over Google Hangout with the research team. It will start with a general meeting covering the goals of the research before conducting the walkthrough individually. The following tasks shall be tested as part of the walkthrough:

- 1) Log in as a guest
 - a) Select “Start”
 - b) Select “Sign in as Guest”
- 2) Order a drink item
 - a) Select “Menu”
 - b) Select “Drinks” tab
 - c) Select “Add to Order”
- 3) Split a bill
 - a) Select “Billing”
 - b) Select “Split Bill”
- 4) Play Pong with patrons at your table
 - a) Select “Entertainment”
 - b) Select “Multi-Player Table Games”
 - c) Select “Pong”
 - d) Select a player to challenge
 - e) Select “Start Game”
- 5) Call Waiter
 - a) Select “Call Waiter”
 - b) Confirm call

For each step of the cognitive walkthrough, the examiner will record the answer to the questions below. The purpose of this is to identify if a first time user will understand what, how and if they completed task correctly. By doing so, the application can be tailored to first time, transient and impaired users. The questions are as follows:

- Will the user know what to do?
- Will the user see how to do it?
- Will the user understand from the feedback whether the action was correct?

The examiner should also consider, as appropriate:

- Assumptions about what could cause problems and how;
- Notes about side issues;
- Notes about possible solutions.

IV. EMPIRICAL RESEARCH

A. Research Goals

The major goal of the empirical research plan is to determine how an actual user will respond to the prototype. The goals of the research are to determine:

- How long it takes for the users to learn the basic functionality;
- The impact of intoxication on the use of the application;

- Gain insights on how a waiter, user and application will interact together and
- Gain user insights on how they expect the application to work versus how it does.

B. User Details

The user that will be evaluated for the empirical study is a 28-year-old, male pharmacy technician living in Vancouver, BC. He was selected for the study as he is in the target demographic range for the application and represents an average bar user. He has an interest in technology and has shown enthusiasm about the bar application. To improve the relevance of the study, the user will conduct the study whilst intoxicated. Please be aware that the user freely agreed to conduct the study intoxicated and will monitor his own alcohol consumption. The research team will record the level of user intoxication; however it does not promote nor encourage the consumption of alcohol.

C. Research Plan

As this empirical study is focusing on the identification of usability problems, a usability study will be conducted. This will take the form of a Google hangout meeting between the user and the research team. A member of the research team will take the role of *Study Coordinator* and will be physically present with the user. The purpose of the Study Coordinator is to guide the user through the research tasks. The remainder of the research team will record details of the user experience and will not interact with the user directly whilst the study is taking place. The purpose of this is to prevent intimidating the user.

The study has been designed to replicate the bar experience of a typical user and has been broken down into the following sections:

- Introduction by Study Coordinator taking on the role of the waiter;
- Task 0: The user is free to explore the prototype with no specific task to complete;
- Task 1: The user orders drinks;
- Task 2: The user orders food;
- Task 3: The user is free to access the entertainment features of his choosing;
- Task 4: They finish their drink and want to get a refill;
- Task 5: The users meal arrives whilst they are in an active game;
- Task 6: The user finishes their meal and wants to continue using the entertainment features and
- Task 7: The user wants to pay their bill in a manner of their choosing.

Before the usability study commences, the user is given a brief introduction to the application and its functionality. This introduction is only verbal and is designed to be equivalent to the greeting given by the waiter. The user is also informed that

they are allowed to ask questions about how the interface works when they are talking to the waiter (they will be informed when this is the case). Otherwise the response will be “What would you do in a bar situation” or similar.

The user will also be encouraged to think out loud about what they are doing. The Study Coordinator will take an active role in this, asking questions about any issues the user is having and why. At the end of the study the research team will also have a chance to ask questions about the user experience directly to the user.

D. Follow-up Questions

The following questions will be asked of the user upon completion of the empirical study as well as any additional questions identified during the study:

- Were there any particular tasks that you struggled with and why?
- Was the organization of information on the application screens clear?
- Did you feel comfortable using this system? Explain.
- Was the interface pleasant to use?
- Did the application have all the functions and capabilities you expected it to have?
- Are you satisfied with the application?
- Do you think the system is quick to learn?
- Did you feel confident using the application?

E. Research Materials

The materials that are going to be used for this part of the research include:

- Google hangouts for live web viewing;
- Recording software to record and rewatch/ relisten to all events using the inbuilt xbox game recorder on a Windows 10 device;
- The working prototype run through myBalsamiq and
- And a data form to record observations about the user experience.

F. Collected Data

The following data is intended to be collected during the empirical study:

- Any questions the user may have;
- Any software issues with Google hangouts, recording software and pdfs;
- How the user responds to feedback systems;
- The ease of navigation through linked pages;

- Facial expressions which may indicate confusion, surprise, joy, changes in tone of voice of the user, etc;
- An approximation of time the user spends completing a task;
- The impact of intoxication on usability;
- General observations about the evaluation including user information and
- Time and setting of the evaluation.

In gathering this data, it will be used in order to achieve the research goals and gain deeper insight. Information from the user including questions, facial expressions and the audio recording shall be combined to establish how the application works versus the user's mental model. Recording software shall be used with the research so user responses can be revisited at a later date. The tasks will be time logged in order to understand how well the environment was created to cater to learnability and memorability even while under the influence of alcohol. The navigation and click through structure will be related to the time it takes for the user to navigate in order to once again understand how learnability and memorability play a part in the design. Any other relevant data will be collected in order to explain any anomalies or potential deficiencies in the study.

V. SUMMARY

The final step of the PRICPE process, the evaluation will touch base on 2 different methods of evaluation. Using both of these methods, the research goals of this study will be satisfied. The information gathered through these methods will help uncover interface design issues, navigational and functionality issues, learnability and memorability issues and the impact of intoxication on use of the bar application. The first method, an analytical evaluation will help to uncover issues through experimental researchers' own walkthroughs of the prototype. For the analytical evaluation, a walkthrough was chosen because it is the most thorough and will help uncover deeper issues before the empirical walkthrough begins.

The walkthrough will test login, ordering, entertainment, bill splitting and call waiter function. The second method, an empirical walkthrough will provide a second source of information and perhaps more insightful findings with regards to research goals. This section of research will consist of a live user testing the application while slightly intoxicated in order to further gain insight into the research goals with a typical bar patron. The user will be assisted by a study coordinator who will act similarly to a waiter in the restaurant, answering only relevant question the user might have. The empirical evaluation will be observed by all 5 researchers, 4 of which will be watching through Google Hangouts, and 1 of which will be live with the user. The evaluation method will provide insightful feedback which will be used in the iterative process of design to eventually develop the prototype into a working bar application.