

Mango Health Comparison Usability Report

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Executive Summary

A comparison study was done utilizing the app Mango Health. Screenshots from the iPhone and Android versions were put together into two flinto prototypes. The purpose of the study was to look at how easy the task was to complete with two different navigation types in the application. We hypothesized that the hamburger navigation will be easier to use then the bottom bar navigation and that the task will be completed quicker when using the hamburger navigation then the bottom bar navigation.

To complete this study ten participants were recruited, given two tasks using a within subjects design. Five participants started task B with the other half starting task A. All participants were given a pre-usability survey to answer demographics, sign a consent form, given two tasks, and asked post task questions to gauge the ease of use for each task. The breakdown of participants is as follows.

- 4 Female (ages 23-49), 6 Male (ages 25-50).
- All participants take at least one medication a week.
- All participants had a high level of comfortableness using a smartphone (avg 6.3 with 7 being highest).

To accomplish this comparison study the ten participants were recruited to do the following two tasks in a flinto prototype.

- Start the app and sign into an account using hamburger menu (task A).
- Start the app and sign into an account using the bottom bar navigation (task B).

After all participants completed their comparison studies, basic statistics were run on the data collected, averages, standard deviations, t-test comparing the two tasks, and a confidence interval for the means for each task. No major statistical difference was found between the two tasks/groups.

Purpose and Test Objective

The Mango Health application is for people who need some way to keep track of the medications they are taking, general medical activity (ex: doctors appointments), as well as overall medical levels (ex: blood pressure, daily mood). In our previous usability study on the Mango Health application, we found that participants kept trying to use the information on the main "Home" page to navigate the application instead of the bottom navigation bar. One participant also stated that they would much

rather have something simpler, such as a hamburger menu, to use for navigating through the application. From these findings, we decided to do a comparison study on the two navigation types: 1. hamburger menu, 2. bottom bar navigation.

Alternative Hypo 1: We hypothesize that the hamburger navigation will be easier to use than the bottom bar navigation.

Alternative Hypo 2: We also hypothesize that the task will be completed quicker when using the hamburger navigation than the bottom bar navigation.

Methods

Participants

	Female	Male
Participants	4	6
Age Range	23-49	24-50
Average comfort level with smartphone (1=low, 7=high)	6.3/7	5/7
Average medications taken in past week	2	1.4

Test Design

In this within-subjects study, each participant will complete the same task for Treatment A and B. Five participants will start with treatment A and five will start with treatment B. Our test session will be a maximum of 10 minutes long.

Introduction (5 minutes)

Test moderator will:

1. Greet the participant and go over the "Intro" script. [Appendix B1]
2. Present consent form to the participant go over the form and have the participant sign. [Appendix C]

Background Interview (2 minutes)

Test moderator will gather information on participants [Appendix B2]:

1. Demographics.
2. Current history of medication use.
3. Comfort level of using a smartphone.

Tasks and Post-task Questions (10 minutes)

Participants will start with either treatment A or B, and work through the task for each treatment with a post-task question administered after each treatment [Appendix B3]

Participants starting with Treatment A:

1. Test moderator will then administer and observe task for Treatment A.
2. Test moderator will then administer and observe task for Treatment B.
3. Test moderator will then ask participant exit interview survey and thank them for their time.

Participants starting with Treatment B:

1. Test moderator will then administer and observe task for Treatment B.
2. Test moderator will then administer and observe task for Treatment A.
3. Test moderator will then ask participant exit interview survey and thank them for their time.

Task List

Task for both Treatment A and B:

- Starting from the phone's home page, Log into the Mango Health application.

Test Environment

The test environment will consist of a well-lit quiet room that has at least two chairs and a table. The participant and monitor will sit at the table. Participants will use an iOS device running iOS 9.2 with the Mango Health app installed. Test moderator will have setup the device with the app and scheduled medication taken under a test account previously created. An audio recording device will be used to capture participant's comments and think-aloud protocol.

Test Moderator Role

The test moderator will serve a multi-purpose role. They will greet the participant, introduce the

session, have them sign the consent form, explain and deliver the test, and ask follow-up questions after completing each task. The test moderator will also observe and take notes as the participant does their four tasks as outlined in the test design. The test moderator will have a script to read from and follow, a log sheet to capture any extraneous notes, consent form, and time the participants tasks.

Evaluation Measures

To understand the usability test the following will be collected:

- Participant demographics.
- All tasks will be timed individually.
- Follow-up question will contain a question on the ease of use for each treatment.
- We will use two-tailed t-tests to compare the average ease of use as well as the average times for each treatment.

Results

The following table gives a breakdown of the average time taken and ease of use score for each task and the confidence interval for each.

	Task A (Hamburger menu)	Task B (Bottom bar menu)
Average time taken to complete in seconds	50.4	47.2
Confidence Interval for mean at 95% (time on task)	22.63 to 78.13	21.37 to 73.07
Average Task difficulty (1=very hard / 7=very easy)	4.4	4.3
Confidence Interval for mean at 95% (difficulty)	2.85 to 5.95	3.33 to 5.27

To examine the two groups a two tailed t test was used. We found there was no statistical difference in ease of use for the two navigation types ($t_{(18)}=.11$, $P = .92$). There was also no statistical difference with time on task for the two navigation types ($t_{(18)}=.17$, $P = .87$).

Findings & Recommendations

After analyzing the results from the usability tests, we found that there was no difference in ease of use and time on task between the two navigation types. From these findings we can speculate as to why there is no preference between the two navigation types. Our study only had a sample size of 10. All the participants in our study stated they had a higher than average level of comfort when using a smartphone. A study with a larger participant pool or participants that were not as comfortable with smartphones may show that one navigation style to be easier to use.

Our study utilized a within subjects design which may have affected the results even with counter balancing. Any further study would also benefit from using a between subjects design as using within subjects may have affected the results for their second task. At this point we can only recommend further research utilizing targeted demographics, a larger participant pool, and a between subjects design.

Appendix

A. Test Moderator Setup

- Ensure the test device has enough power to last throughout the task for each treatment (½ power or more).
- Ensure the application prototypes for Mango Health are installed and can be seen on the screen.
- Monitor will have a post task question at the end of each task that will be asked of the participant and recorded.
- Monitor will use the log sheet to take note of start/stop time.

B. Moderator Script

1. Introduction

My name is [insert name here]. Thank you for meeting with me today and agreeing to take part in our usability study. We are testing two versions of the medical application called Mango Health and need your participation in order to test this product. This is an application that is used to keep track of medications and other health related information.

Before we begin we have a consent form for you to review and sign. [Give them the consent form and go over highlights of consent form.]

[After consent form has been signed and returned]

2. Demographics

Before we start we just have a few demographic questions so that we can better understand the participants.

Name:

Age:

Sex:

How many medications or supplements have you taken in the past week?

Do your medications require you to take them at certain times during the day?

How comfortable are you using your smartphone on a scale of 1 to 7?

(1 - not at all comfortable, 7 - extremely comfortable)

3. Task

During this session we will give you one task to complete for each version of the application.

During these tasks we would like you to think out loud when going through each task and say anything that comes to mind. Please remember that we are not testing you, and so there is no right or wrong answer.

For each task we will be taking notes as well as an audio recording.

Do you have any questions before we begin?

Task Script for the task in Treatment A:

[Moderator will have done the setup for the device. The prototype application icon for Mango Health Treatment A will be visible on the device. Mango Health prototype should not be running or have an account logged in.]

Overall, this task was:

Very difficult Very easy

Task Script for the task in Treatment B:

[Moderator will have done the setup for the device. The prototype application icon for Mango Health Treatment B will be visible on the device. Mango Health prototype should not be running or have an account logged in.]

Overall, this task was:

Very difficult Very easy

4. Wrap Up

[If participant seems eager to chat or you think the participant could elaborate more, ask some questions about how they felt about the app, if something like this app would be useful to them.]

Thank you very much for your time, if you have any questions about this test please feel free to contact us via the emails in the consent form.

C. Consent Form

ADULT CONSENT TO PARTICIPATE IN RESEARCH

Mobile Medication App Study

Principal Investigators:

Carolina Barrios, Graduate Student

Xavier Green, Graduate Student

Kam Lie, Graduate Student

Institution: DePaul University, Chicago, Illinois, USA

Department (School, College): HCI, CDM

Faculty Advisor: Enid Montague

What is the purpose of this research?

We are asking you to be in a research study because we are trying to learn more about App usability with regards to medication scheduling using Mango Health. This study is being conducted by Carolina Barrios, Xavier Green and Kam Lie. They are graduate students at DePaul University conducting this research as a requirement to obtain their Master's degrees. This research is being supervised by their faculty advisor, Enid Montague. There may be other people on the research team assisting with the study.

We hope to include about five people in this research.

Why are you being asked to be in the research?

You are invited to participate in this study because you are currently taking multiple medications or supplements and have a smartphone. You must be age 18 or older to be in this study. This study is not approved for the enrollment of people under the age of 18.

What is involved in being in the research study?

If you agree to be in this study, being in the research involves:

- Filling out a background demographic survey on age, gender, and your smartphone skill level.
- Being observed and recorded while completing assigned tasks on the app Mango Health.

How much time will this take?

This study will take about 20 to 30 minutes to complete. It may take longer depending on your familiarity with smartphones.

Are there any risks involved in participating in this study?

Being in this study does not involve any risks other than what you would encounter in daily life. You may feel uncomfortable or embarrassed about answering certain questions. You do not have to answer any question you do not want to. In this study you will be creating an account with a third party which we have no control over. Any information you give them will be governed by their privacy policy. You do not have to use your real information on the site to complete this study.

Are there any benefits to participating in this study?

You may benefit from the research by learning more about apps that schedule medication.

Can you decide not to participate?

Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences, penalties, or loss of benefits if you decide not to participate or change your mind later and withdraw from the research after you begin participating.

Who will see my study information and how will the confidentiality of the information collected for the research be protected?

The research records will be kept and stored securely. Your information will be combined with information from other people taking part in the study. When we write about the study or publish a paper to share the research with other researchers, we will write about the combined information we have gathered. We will not include your name or any information that will directly identify you. We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. However, some people might review or copy our records that may identify you in order to make sure we are following the required rules, laws, and regulations. The DePaul University Institutional Review Board, and/or the Data and Safety Monitoring Board] may review your information. If they look at our records, they will keep your information confidential.

If there any recordings, the recordings will be kept until accurate written notes have been made, then they will be destroyed.

Who should be contacted for more information about the research?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study or you want to get additional information or provide input about this

research, you can contact the researchers Carolina Barrios (cbbarrios23@gmail.com), Xavier Green (xjgmedia@gmail.com) or Kam Lie (kamlie@gmail.com).

This research has been reviewed and approved by the DePaul Institutional Review Board (IRB). If you have questions about your rights as a research subject you may contact Susan Loess-Perez, DePaul University's Director of Research Compliance, in the Office of Research Services at 312-362-7593 or by email at sloesspe@depaul.edu.

You may also contact DePaul's Office of Research Services if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.

You will be given a copy of this information to keep for your records.

Statement of Consent from the Subject:

I have read the above information. I have had all my questions and concerns answered. By signing below, I indicate my consent to be in the research.

Signature: _____

Printed name: _____

Date: _____

D. Moderator Script

	Time on Task (A)	Time on Task (B)
Participant 1		
Participant 2		
Participant 3		
Participant 4		

E. Contributors and Roles

Contributor Name	Contribution to Test Plan
Carolina Barrios (cbbarrios23@gmail.com)	Initial outline, Purpose and Test Objective, Task list, Results, Findings and Recommendations, Moderator log, edits, Final edits
Xavier Green (xigmedia@gmail.com)	Participants, Results, Findings and Recommendations, edits, Project 3 slides
Kam Lie (kamlie@gmail.com)	Executive Summary, Participants, results, Findings and Recommendations, edits, Final edits, Screenshots, project 2 and 4 slides