**ThermoBank**

# Usability Test Plan

**ThermoBank NVDK v.4.0]**

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## Table of Contents

[Document Overview 3](#_Toc359583313)

[Executive Summary 3](#_Toc359583314)

[Methodology 3](#_Toc359583315)

[Participants 4](#_Toc359583316)

[Training 4](#_Toc359583317)

[Procedure 4](#_Toc359583318)

[Roles 5](#_Toc359583319)

[Trainer 5](#_Toc359583320)

[Facilitator 5](#_Toc359583321)

[Data Logger 6](#_Toc359583322)

[Test Observers 6](#_Toc359583323)

[Ethics 6](#_Toc359583324)

[Usability Tasks 6](#_Toc359583325)

[Usability Metrics 7](#_Toc359583326)

[Scenario Completion 7](#_Toc359583327)

[Critical Errors 7](#_Toc359583328)

[Non-critical Errors 7](#_Toc359583329)

[Subjective Evaluations 7](#_Toc359583330)

[Scenario Completion Time (time on task) 8](#_Toc359583331)

[Usability Goals 8](#_Toc359583332)

[Completion Rate 8](#_Toc359583333)

[Error-free rate 8](#_Toc359583334)

[Time on Task (TOT) 8](#_Toc359583335)

[Subjective Measures 8](#_Toc359583336)

[Problem Severity 8](#_Toc359583337)

[Impact 9](#_Toc359583340)

[Frequency 9](#_Toc359583341)

[Problem Severity Classification 9](#_Toc359583342)

[Reporting Results 9](#_Toc359583343)

## Document Overview

This document describes a test plan for conducting a usability test during the development of ThermoBank hardware and mobile application. The goals of usability testing include establishing a baseline of user performance, establishing and validating user performance measures, and identifying potential design concerns to be addressed in order to improve the efficiency, productivity, and end-user satisfaction.

The usability test objectives are:

* To determine software design inconsistencies and usability problem areas within the user interface and content areas. Potential sources of error may include:
  + Navigation errors – failure to locate functions, excessive keystrokes to complete a function, failure to follow recommended screen flow.
  + Presentation errors – failure to locate and properly act upon desired information in screens, selection errors due to labeling ambiguities.
  + Control usage problems – improper toolbar or entry field usage.
* Exercise the application conditions with representative users. Data will be used to access whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
* Establish baseline user performance and user-satisfaction levels of the user interface for future usability evaluations.
* Establish accepted comfort level and look of Thermobank hardware with representative users.

Ideal candidate for participation spends free time wandering local parks, mountain ranges, and may travel alone/groups. Candidate usually depends on a smart phone to help navigation and determine the safety. Test will take place on Georgia State University campus or public common areas. ThermoBank is marketed towards hikers and people “on the go”. The total amount of participants needed will be 8-10 participants. Usability testing will begin April 10, 2019 through April 22, 2019.

## Executive Summary

Our mobile app will feature many functions in a stand -alone app. Several functions include:

* + Ability to attach and charge phone on the wrist device and can allow user to check battery percent
  + Has access to an onboard Survival Guide that allows users to check on basic/advanced tips for camping/hiking and other information needed for any hiking problem
    - First Aid application
    - How to set up an effective camp
    - Various information on plants/animals relative to the trip user chose
  + Has stored information on various parks/trails/ranges and obtain detailed information on them
    - Degree of difficulty
    - Average hiking time
    - Total distance from start to finish
    - # of checkpoints
    - Average amount of other travelers
    - Recommended gear, time of day, and weather time to travel safely

We have identified some key areas in our design have prompted key questions that are vital to goals propelling ThermoBank progression.

* What do you think these icons mean?
* Anything difficult to read?
* Can I create a profile page?
* How do I share messages or pictures?
* How do I add my picture?
* How view pdf or video files within the app?

The following questions are derived from our quest to improve hardware user experience.

* Would this device be comfortable to wear for a long time?
* How do I know how much is energy being created?

Upon review of this usability test plan, including the draft task scenarios and usability goals for ThermoBank documented acceptance of the plan is expected.

## Methodology

### Participants

A total of 10 Participants will be needed of all different ages, sex, and race. Participants will be recruited in the location of Georgia State University’s campus common area such as courtyards and libraries. Participants should have prior general knowledge of smartphone and mobile app usage. Platforms such as Facebook and Twitter generally suffice. Volunteer’s will be asked key questions pertaining to likeliness to participate in outdoor activities. If responses meet 2/3, criteria then prompt for candidate to move forward to usability testing phase. The participants' responsibilities will be to attempt to complete a set of representative task scenarios presented to them in as efficient and timely a manner as possible, and to provide feedback regarding the usability and acceptability of the user interface. The participants will be directed to provide honest opinions regarding the usability of the application, and to participate in post-session subjective questionnaires and debriefing.

### Training

The participants will receive and overview of the usability test procedure, equipment and software.

### Procedure

Participants will take part in the usability test at Georgia State University on campus common areas. A mobile phone/laptop mobile application and supporting software such as Adobe xD will be used in an outdoor, “on the go”, environment. Note takers and data logger(s) will monitor the sessions by video camera. The test sessions will be videotaped.

The facilitator will brief the participants on the web application and instruct the participant that they are evaluating the application, rather than the facilitator evaluating the participant. Participants will sign an informed consent that acknowledges: the participation is voluntary, that participation can cease at any time, and that the session will be videotaped but their privacy of identification will be safeguarded. The facilitator will ask the participant if they have any questions.

Participants will complete a pretest demographic and background information questionnaire. The facilitator will explain that the amount of time taken to complete the test task will be measured and that exploratory behavior outside the task flow should not occur until after task completion. At the start of each task, the participant will read aloud the task description from the printed copy and begin the task. Time-on-task measurement begins when the participant starts the task however may not be recorded and reported in results.

The facilitator will observe the participant to ‘think aloud’ so that a verbal record exists of their interaction with the Thermobank mobile application. The facilitator will observe and enter user behavior, user comments, and system actions in the data logging application.

After each task, the participant will complete the post-task questionnaire and elaborate on the task session with the facilitator. After all task scenarios are attempted, the participant will complete the post-test satisfaction questionnaire.

## Roles

The roles involved in a usability test are as follows. An individual may play multiple roles and tests may not require all roles.

### Volunteer Organizer

* Provide initial contact with potential candidate’s prior to usability testing
* Ask preliminary questions for participation qualification
* Gets acceptance document signed for usability testing

### Facilitator

* Provides overview of study to participants
* Defines usability and purpose of usability testing to participants
* Assists in conduct of participant and observer debriefing sessions
* Responds to participant's requests for assistance

### Data Logger

* Records participant’s actions and comments

### Test Observers

* Silent observer
* Assists the data logger in identifying problems, concerns, coding bugs, and procedural errors
* Serve as note takers.

**Test Participants**

* Provides feedback of usability and usability testing

### Ethics

All persons involved with the usability test are required to adhere to the following ethical guidelines:

* The performance of any test participant must not be individually attributable. Individual participant's name should not be used in reference outside the testing session.
* A description of the participant's performance should not be reported to his or her manager.

## Usability Tasks

To perform the usability tasks below a mobile device or laptop with Adobe XD software will need to be installed. In addition to these requirements an internet will also be important to record data.

The task descriptions below are required to be reviewed by the application owner, business-process owner, development owner, and/or deployment manager to ensure that the content, format, and presentation are representative of real use and substantially evaluate the total application. Their **acceptance is to be documented** prior to usability test.

ThermoBank team uses Georgia State University campus common areas to interview and scout potential participants.

Potential Participants shall be asked questions by team members about frequency and intensity of hiking and outdoor activities.

Answer of yes to questions leading to a participant match will qualify subject as participant.

Participants will be asked to test mobile software and give feedback while being recorded.

Participants will be asked to sign form granting permission to record and use data provided.

The facilitator will then read the parameters and procedures of the test. (This sheet must be signed by both facilitator and participant)

Per procedures video is started and test begins by asking the user to perform a task on the mobile platform and deliver feedback how the hardware device feels and looks on their wrist.

To conclude, participants are asked five questions used to extract data utilized for future implantation.

All answers are recorded by facilitator to ensure completeness.

## Usability Metrics

Usability metrics refers to user performance measured against specific performance goals necessary to satisfy usability requirements. Scenario completion success rates, adherence to dialog scripts, error rates, video recordings and subjective evaluations will be used.

### Scenario Completion

Each scenario will require, or request, that the participant obtains or inputs specific data that would be used in course of a typical task. The scenario is completed when the participant indicates the scenario's goal has been obtained (whether successfully or unsuccessfully) or the participant requests and receives sufficient guidance as to warrant scoring the scenario as a critical error.

### Critical Errors

Critical errors are deviations at completion from the targets of the scenario. Obtaining or otherwise reporting of the wrong data value due to participant workflow is a critical error. Participants may or may not be aware that the task goal is incorrect or incomplete.

Independent completion of the scenario is a universal goal; help obtained from the other usability test roles is reason to score the scenario a critical error. Critical errors can also be assigned when the participant initiates (or attempts to initiate) and action that will result in the goal state becoming unobtainable. In general, critical errors are unresolved errors during the process of completing the task or errors that produce an incorrect outcome.

### Non-critical Errors

Non-critical errors are errors that are recovered from by the participant or, if not detected, do not result in processing problems or unexpected results. Although non-critical errors can be undetected by the participant, when they are detected they are generally frustrating to the participant.

These errors may be procedural, in which the participant does not complete a scenario in the most optimal means (e.g., excessive steps and keystrokes). These errors may also be errors of confusion (ex., initially selecting the wrong function, using a user-interface control incorrectly such as attempting to edit an un-editable field).

Noncritical errors can always be recovered from during the process of completing the scenario. Exploratory behavior, such as opening the wrong menu while searching for a function, will not be coded as a non-critical error.

### Subjective Evaluations

Subjective evaluations regarding ease of use and satisfaction will be collected via questionnaires, and during debriefing at the conclusion of the session. The questionnaires will utilize free-form responses and rating scales.

### Scenario Completion Time (time on task)

The time to complete each scenario, not including subjective evaluation durations, will be recorded.

## Usability Goals

The next section describes the usability goals for ThermoBank.

### Completion Rate

Completion rate is the percentage of test participants who successfully complete the task without critical errors. A critical error is defined as an error that results in an incorrect or incomplete outcome. In other words, the completion rate represents the percentage of participants who, when they are finished with the specified task, have an "output" that is correct. Note: If a participant requires assistance in order to achieve a correct output then the task will be scored as a critical error and the overall completion rate for the task will be affected.

**A completion rate of 100% is the goal for each task in this usability test.**

### Error-free rate

Error-free rate is the percentage of test participants who complete the task without any errors (critical **or** non-critical errors). A non-critical error is an error that would not have an impact on the final output of the task but would result in the task being completed less efficiently.

**An error-free rate of 80% is the goal for each task in this usability test.**

### Time on Task (TOT)

The time to complete a scenario is referred to as "time on task". It is measured from the time the person begins the scenario to the time he/she signals completion.

### Subjective Measures

Subjective opinions about specific tasks, time to perform each task, features, and functionality will be surveyed. At the end of the test, participants will rate their satisfaction with the overall system. Combined with the interview/debriefing session, these data are used to assess attitudes of the participants.

## Problem Severity

To prioritize recommendations, a method of problem severity classification will be used in the analysis of the data collected during evaluation activities. The approach treats problem severity as a combination of two factors - the impact of the problem and the frequency of users experiencing the problem during the evaluation.



### Impact

Impact is the ranking of the consequences of the problem by defining the level of impact that the problem has on successful task completion. There are three levels of impact:

* High - prevents the user from completing the task (critical error)
* Moderate - causes user difficulty but the task can be completed (non-critical error)
* Low - minor problems that do not significantly affect the task completion (non-critical error)

### Frequency

Frequency is the percentage of participants who experience the problem when working on a task.

* High: 70% or more of the participants experience the problem
* Moderate: 21% - 69% of participants experience the problem
* Low: 20% or fewer of the participants experience the problem

Example: low frequency derived by individual participant /total participants (1/10 = .100) or 10.0%

### Problem Severity Classification

The identified severity for each problem implies a general reward for resolving it, and a general risk for not addressing it, in the current release.

**Severity 1** - High impact problems that often prevent a user from correctly completing a task. They occur in varying frequency and are characteristic of calls to the Help Desk. Reward for resolution is typically exhibited in fewer Help Desk calls and reduced redevelopment costs.

**Severity 2** - Moderate to high frequency problems with moderate to low impact are typical of erroneous actions that the participant recognizes needs to be undone. Reward for resolution is typically exhibited in reduced time on task and decreased training costs.

**Severity 3** - Either moderate problems with low frequency or low problems with moderate frequency; these are minor annoyance problems faced by a number of participants. Reward for resolution is typically exhibited in reduced time on task and increased data integrity.

**Severity 4** - Low impact problems faced by few participants; there is low risk to not resolving these problems. Reward for resolution is typically exhibited in increased user satisfaction.

## Reporting Results

The Usability Test Report will be provided at the conclusion of the usability test. It will consist of a report and/or a presentation of the results; evaluate the usability metrics against the pre-approved goals, subjective evaluations, and specific usability problems and recommendations for resolution. The recommendations will be categorically sized by development to aid in implementation strategy. The report is anticipated to be delivered by April 26, 2019