

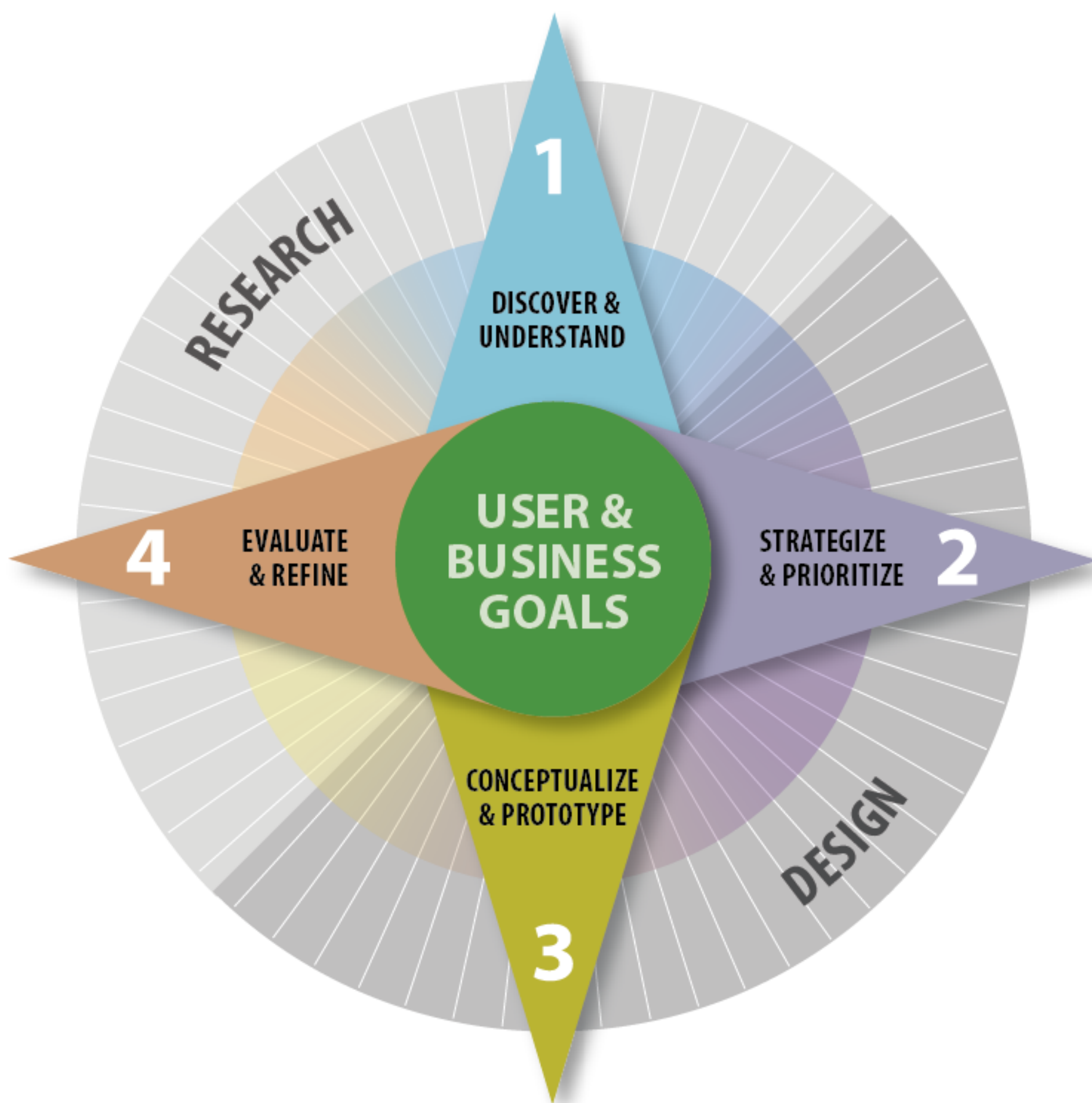
Usability Testing

CMPT 363

“Use testing to guide design, not to grade designers.”

— Jeff Johnson

How to plan, conduct, and summarize usability tests?



Topics to Explore

1. Testing Methods
2. Conducting Tests
3. Analysis and Reporting

How to plan, conduct, and summarize usability tests?

Testing Methods

What is Usability Testing?

Simply put, having other people try to complete specific tasks with your product or service

1
OFFICIAL BALLOT, GENERAL ELECTION
PALM BEACH COUNTY, FLORIDA
NOVEMBER 7, 2000

OFFICIAL BALLOT, GENERAL ELECTION
PALM BEACH COUNTY, FLORIDA
NOVEMBER 7, 2000

ELECTORS
FOR PRESIDENT
AND
VICE PRESIDENT

(A vote for the candidates will
actually be a vote for their electors.)

(Vote for Group)

(REPUBLICAN)

GEORGE W. BUSH - PRESIDENT
DICK CHENEY - VICE PRESIDENT

3 ➡

(DEMOCRATIC)

AL GORE - PRESIDENT
JOE LIEBERMAN - VICE PRESIDENT

5 ➡

(LIBERTARIAN)

HARRY BROWNE - PRESIDENT
ART OLIVIER - VICE PRESIDENT

7 ➡

(GREEN)

RALPH NADER - PRESIDENT
WINONA LaDUKE - VICE PRESIDENT

9 ➡

(SOCIALIST WORKERS)

JAMES HARRIS - PRESIDENT
MARGARET TROWE - VICE PRESIDENT

11 ➡

(NATURAL LAW)

JOHN HAGELIN - PRESIDENT
NAT GOLDHABER - VICE PRESIDENT

13 ➡

(REFORM)

PAT BUCHANAN - PRESIDENT
EZOLA FOSTER - VICE PRESIDENT

➡ 4

(SOCIALIST)

DAVID McREYNOLDS - PRESIDENT
MARY CAL HOLLIS - VICE PRESIDENT

➡ 6

(CONSTITUTION)

HOWARD PHILLIPS - PRESIDENT
J. CURTIS FRAZIER - VICE PRESIDENT

➡ 8

(WORKERS WORLD)

MONICA MOOREHEAD - PRESIDENT
GLORIA La RIVA - VICE PRESIDENT

➡ 10

WRITE-IN CANDIDATE

To vote for a write-in candidate, follow the
directions on the long stub of your ballot card.



EMERGENCY ALERTS



Emergency Alert

BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL.

Settings

1. State EOC

1. TEST Message

DRILL-PACOM (DEMO) STATE ONLY

False Alarm BMD (CEM) - STATE ONLY

Monthly Test (RMT) - STATE ONLY

PACOM (CDW) - STATE ONLY

Types of Usability Testing

Summative (verification)

Usability tests (often more formal) at the end of a development process or on a released product to assess if the interface meets pre-defined standards

Quantitative measurements (stats) are often the focus

Types of Usability Testing

Formative (diagnostic)

Usability tests (often less formal) during the design process to help identify usability issues before development is finalized or a product is released

Qualitative insights (details) are often the focus

Why Conduct Usability Tests?

Learning opportunity for even the most experienced designers

Why Conduct Usability Tests?

A very effective form of risk mitigation

Why Conduct Usability Tests?

Insight into the critical “first-use” user experience

Why Conduct Usability Tests?

Often the process of preparing for the test will result in discovering areas which can be improved

Why Conduct Usability Tests?

All products and services will be usability tested once released!

What are the Limitations of Usability Testing?

- Often done in artificial test environments (unless conducted remotely or on-location)
- Not really proof that the product works
- Participants are often not actual users
- Time-consuming and difficult to properly conduct extensive comparative tests
- Measures learnability rather than overall usability
- Not a replacement for interface design skills

Usability Test Formats

- 5 second test
- Paper and pencil
- Observational

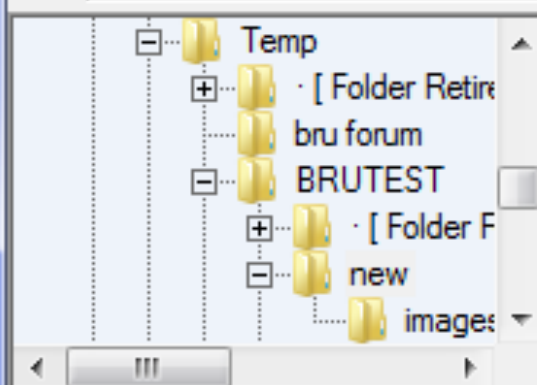
5 Second Test

Show an image of a design to users for only 5 (five) seconds, and ask for their initial impressions

Bulk Rename Utility



C:\Temp\BRUTEST\new



Name	New Name	Size	Modified
images	images		11/01/2016 12:24:35 PM
Buy.php	Buy.php	3.61 KB	11/01/2016 2:21:25 PM
buynownew.gif	buynownew.gif	771 B	24/01/2014 3:08:54 PM
ccss.gif	ccss.gif	438 B	24/01/2014 3:57:26 PM
Common.php	Common.php	1.21 KB	11/01/2016 12:58:28 PM
Donate.php	Donate.php	2.09 KB	11/01/2016 1:42:43 PM
Download.php	Download.php	7.64 KB	11/01/2016 2:50:00 PM

RegEx (1)

Match
Replace
☐ Include Ext.

Replace (3)

Replace
With
☐ Match Case

Remove (5)

First n Last n
From to
Chars Words
Crop Before
☐ Digits ☐ High ☐ Trim
☐ D/S ☐ Accents ☐ Chars
☐ Sym. Lead Dots

Add (7)

Prefix
Insert
at pos.
Suffix
☐ Word Space

Auto Date (8)

Mode
Type
Fmt
Sep. Seg.
Custom
☐ Cent. Off.

Numbering (10)

Mode at
Start Incr.
Pad Sep.
Break ☐ Folder
Type
Roman Numerals

Move/Copy Parts (6)

Append Folder Name (9)

Name Sep. Levels

Extension (11)

Filters (12)

Mask ☐ Match Case ☐ RegEx
☐ Folders ☐ Hidden ☐ Subfolders
Name Len Min Max
Path Len Min Max
Condition

Copy/Move to Location (13)

Path
☒ Copy not Move

Special (14)

☐ Change File Attributes ☐ Change File Timestamps ☐ Character Translations ☐ Javascript Renaming
☐ Status: Not Set ☐ Status: Not Set ☐ Status: Not Set ☐ Status: Not Set

Reset

Revert

Rename

A Better Finder Rename 9 [Registered]

Category: Characters

Action: Replace specific characters

i

This action operates on individual characters not on character strings. Use the actions in the "Text" category to perform operations on character sequences.

Replace these characters:

With:

list of characters to be replaced

☒ Ignore case

list of characters to be replaced

☒ Ignore case

list of characters to be replaced

☒ Ignore case

list of characters to be replaced

☒ Ignore case

Change:

☐ The entire file name and extension

☒ The file name without the extension

☐ The file extension with the separator

☐ The file extension without the separator

Current name

Change to

Drag Your Files and Folders Here

Process: ☒ Files ☒ Folders ☐ Subfolders and their contents

⚙️

+

-

×

Please add files to be renamed to preview table above.

Auto

Manual

Save File List...

Show Multi-Step Drawer

Create Droplet...

Perform Renames

Paper and Pencil (aka Sketches)

- Representative users are shown very early versions of interface design elements
- Users are then asked a series of task-oriented questions

Example Task-oriented Questions

- What do you think is the primary purpose of this screen?
- What do you think about the overall organization of this screen?
- What might you do to start the task of ...?

Activity: Task-oriented Questions

Primary purpose of this screen?

Overall organization of this screen?

Start the task of ...?



GALPOLY

SAN LUIS OBISPO

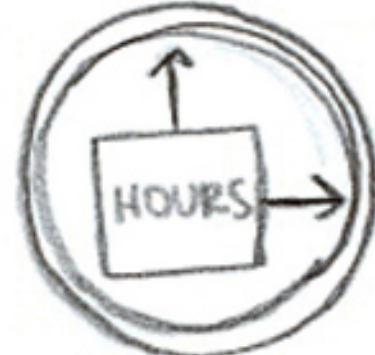
ROBERT E. KENNEDY LIBRARY

BOOKS • ARTICLES • JOURNALS • MORE RESOURCES • HELP >

SEARCH BOX

LIBRARY AND
CAMPUS EVENTS
(revolving pictures)

●●●●●

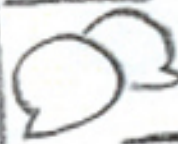


PLAN YOUR
VISIT

ENGAGE

MAPS

POLY CONNECT



ASK
US!



PRINT,
COPY,
SCAN

PLACES TO
STUDY ↗



CO
=



← REVOLVING
INFO. TABS

ASK US!

CALL US!

RESEARCH GUIDES

ASK A LIBRARIAN

CHAT



← BOTTOM
SHOWS MORE
INFO BASED
OFF TAB
SELECTED
ABOVE

Observational Test

A representative user is given one or more tasks to perform with the interface, and the evaluator passively observes

Observational Test

If other colleagues are to be present, be sure to outline procedural expectations for the test

Hawthorne Effect

A famous series of experiments were conducted in 1920's and are often cited as proof that people being observed may try harder than usual to achieve their tasks

Hawthorne Effect

This interpretation as applied to usability studies remains controversial, as the original study was longitudinal (same task over time) and participants were also task experts

Time for Questions & Discussion

- What we've covered so far
 - What is usability testing?
 - 5-second test
 - Paper and pencil
 - Observational test
- Coming up
 - Conducting tests

How to plan, conduct, and summarize usability tests?

Conducting Tests

Conducting Tests

- Pre-test activities
- Observational test activities
- Post-test activities

Pre-Test Activities

- Define test purpose and concerns
- Identify test participants
- Create demographics (user profile) questionnaire
- Decide on test method
- Select tasks to be performed
- Create usability test tasks
- Conduct pilot test

Define Test Purpose

When defining the purpose for a usability test, you are identifying the overall goal for the test

Define Test Purpose

For example, “The purpose of this usability test is to get an early assessment of the overall usability of the software product XYZ”

Define Test Concerns

When defining concerns for a usability test, you are identifying the specific aspects of the interface you want to learn more about

Define Test Concerns

For example, “Can participants successfully submit an order form?” or “Do participants have any difficulty with terms and phrases?”

Define Usability Targets (Summative Tests)

Elements of a Usability Target:

- Condition {a}
- Criteria {b}
- Performance {c}

Example Usability Target (e.g. effectiveness):

With at least 3 months of Windows experience {a}, at least 80% of participants {b} should be able to complete the task of adding a new contact name {c}

Key Usability Target Metrics

- Effectiveness (e.g. 80% of participants can complete the task without assistance)
- Efficiency (e.g. 70% of participants can complete the task in under 10 minutes)
- Attitude (e.g. after performing three tasks, 85% of participants rated their overall satisfaction with the software at least 5.5 out of 7)

GUIDANCE ON USABILITY FROM ISO 9241-11

Effectiveness

Efficiency

Satisfaction



DIALOGUE PRINCIPALS FROM ISO 9241-110

**Suitability
for the Task**

**Suitability
for Learning**

**Suitability for
Individualization**

**Conformity with
User Expectations**

Self Descriptiveness

Controllability

Error Tolerance



PRESENTATION OF INFORMATION FROM ISO 9241-12

Clarity

Discriminability

Conciseness

Consistency

Detectability

Legibility

Comprehensibility

Identify Test Participants

If actual users are not available, the test participants chosen should be as representative of actual users as possible

Sources for Test Participants

- Contacts via marketing or customer support
- Colleagues who are representative users
- Recent employees of your company
- “Dash and grab” company hallway method
- Anywhere you can find them (i.e. “Guerilla” usability testing)



Usability Cafe

<https://www.youtube.com/watch?v=0YL0xoSmyZI>

Usability Problems Found

100%

75%

50%

25%

0%

0

3

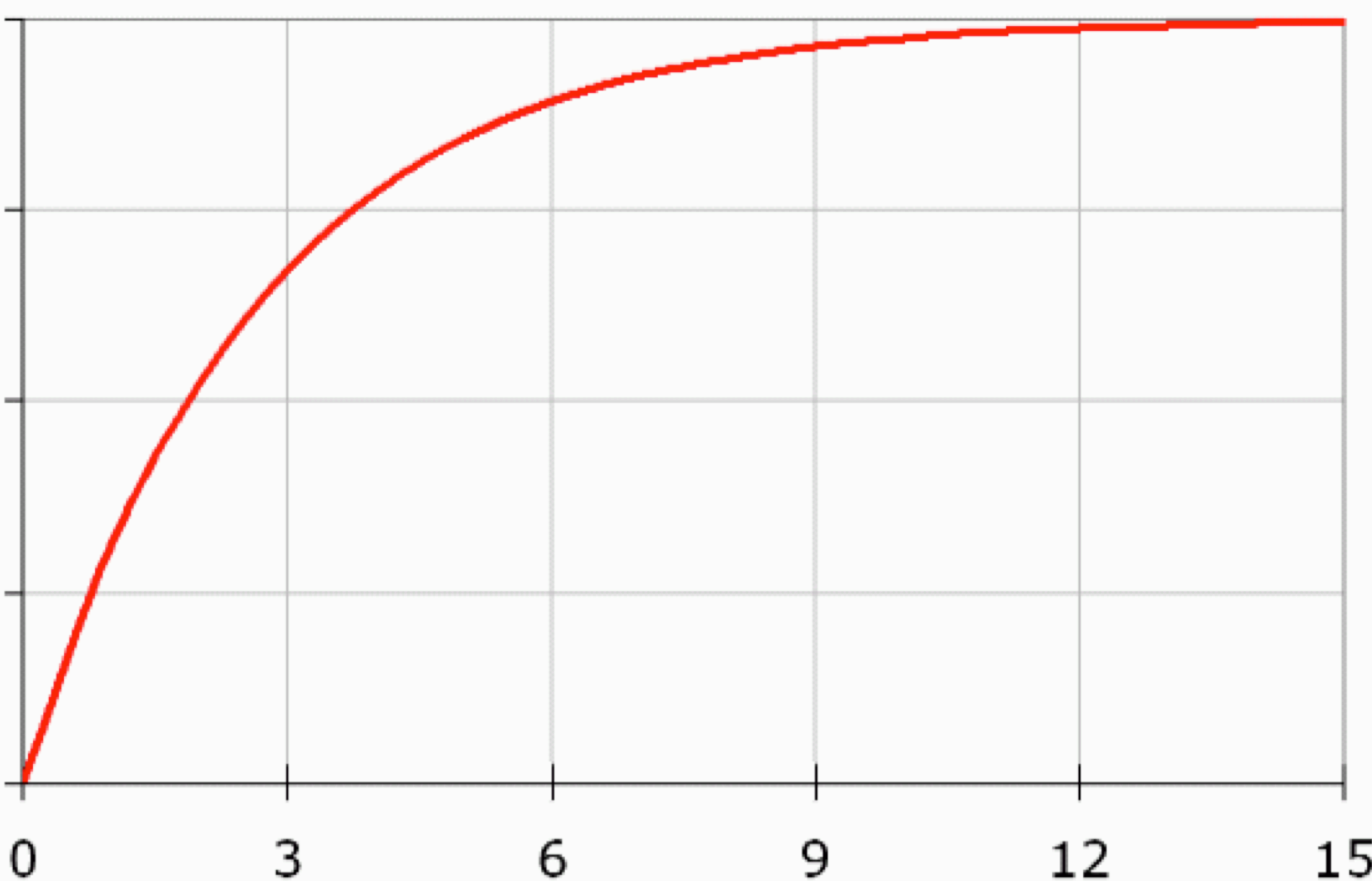
6

9

12

15

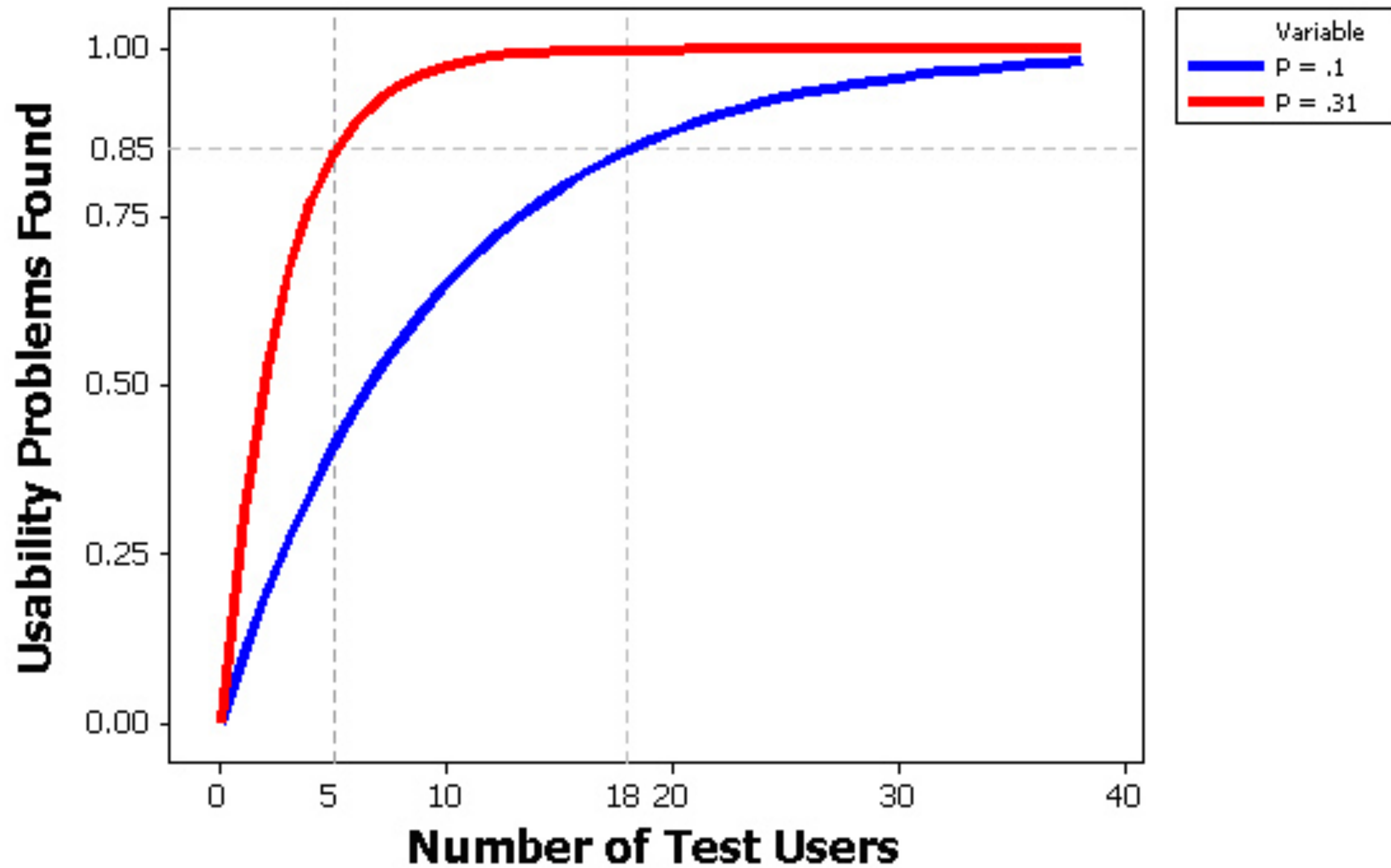
Number of Test Users



An Important Caveat

With 5 users you can detect approximately 85% of the problems in an interface, but the probability is that it only affects 31% of users at least once.

Research has indicated that to be 85% sure you'll see a problem that affects 10% of users at least once 18 users are required.



Research by Faulkner (2003)

No. Users	Minimim % Found	Mean % Found
5	55	85.55
10	82	94.686
15	90	97.050
20	95	98.4
30	97	99.0
40	98	99.6
50	98	100

How Many Users, Really?

“There is no ‘one size fits all’ solution to the challenge here. However, for studies related to problem discovery a group size of 3-20 participants is typically valid, with 5-10 participants being a sensible baseline range.”

– *Ritch Macefield, How To Specify the Participant Group Size for Usability Studies: A Practitioner's Guide (2009)*

User Demographics (User Profile) Questionnaire

A questionnaire should be used to collect and summarize demographic information about all the participants involved in the test

Decide on Test Method

- Simple observation
- Think-aloud method

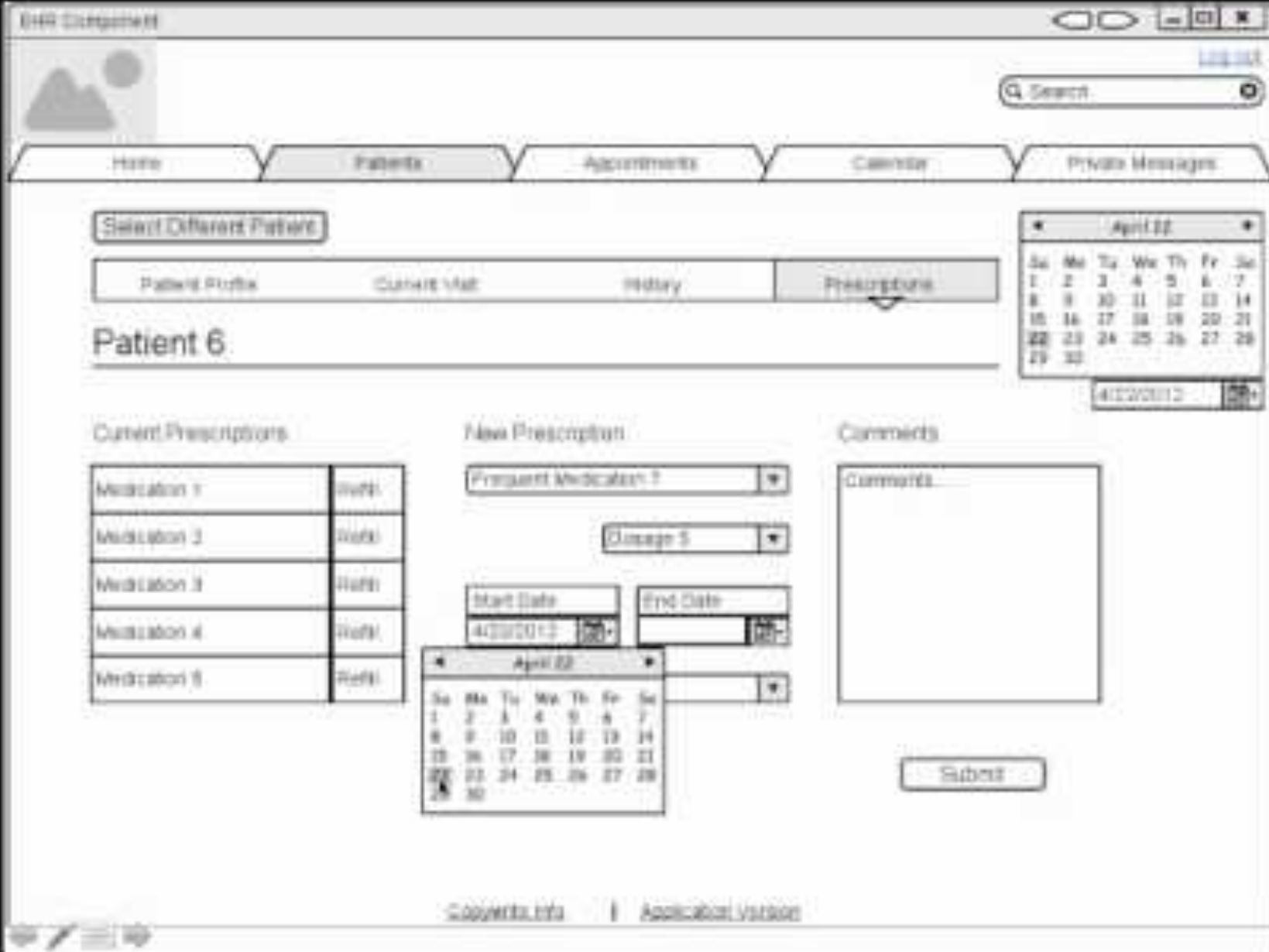
Simple Observation Method

Most basic type of observational usability test

Test participant is observed with as little interaction as possible

Think-aloud Method

- A variation of the simple observational test, where participants are asked to think out loud (describe what they are thinking) while performing tasks
- Most widely used method in the software industry



<https://www.youtube.com/watch?v=0YL0xoSmyZI>

Think-aloud Method

Method is not appropriate if the efficiency (i.e. time on task) is being measured, unless done in a retrospective manner

Prompting Test Participants to Think-aloud

- What they believe is happening
- What they are trying to do
- Questions that arise in their mind
- Things that they find confusing
- Why they decided to try a specific action

Think-aloud Method

- (+) Can reveal user's mental model
- (+) Can be used early in design process
- (+) Precise pointers to problems
- (-) Unnatural situation
- (-) Measurement of time on task not reliable
- (-) Requires more participant effort

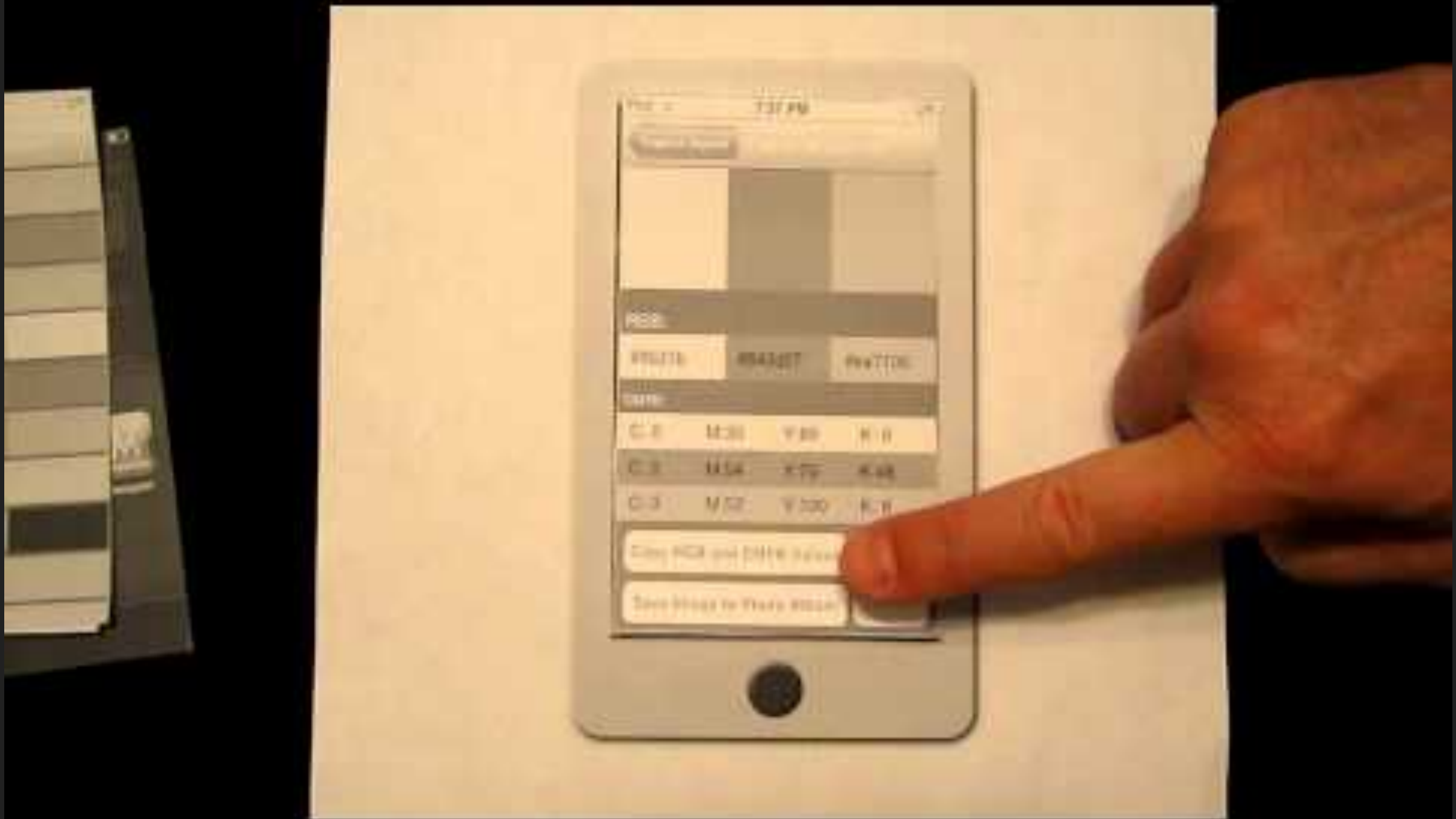
Co-discovery Method (Formative Tests)

Normal conversation between the two participants provides a more natural way of revealing internal thought processes

Decide on Test Environment/Equipment

In-person vs. remote (via screen sharing software)

Paper-based mockups vs. prototype vs. actual system



<https://www.youtube.com/watch?v=V8LNDqMlapY>

Select Tasks to Perform

In general, either frequent tasks and/or important tasks should be selected for inclusion into usability tests

Select Tasks to Perform

Ensure that a very simple task is at the beginning of the usability test

Create Usability Test Tasks

- Tasks should start with a written scenario, describing one or more specific goals
- Communicate intent, but not the operations of what is required to be done
- Avoid using words contained in any user interface elements

Example Usability Test Task

“You are planning to visit family on the east coast, but before you do so you need to temporarily stop your newspaper delivery”

“Cancel your Vancouver Sun newspaper delivery between Oct 10th to 29th.”

Activity: Usability Test Tasks

GROUPS OF 2-3

Create a possible usability test task for students using the myExperience Web app

Conduct Pilot Test

- Identifies issues with test materials (e.g. sequence, wording, etc.)
- Validates time estimates for tasks/session
- Ensures that the mock-up/software is capable of completing specified tasks

Create a Usability Test Plan

- Test purpose
- Test concerns
- Usability targets (summative tests)
- Participant user profile
- Test method
- Test environment and equipment
- Test tasks
- Evaluation measurements

USABILITY TEST PLAN DASHBOARD

AUTHOR		CONTACT DETAILS		FINAL DATE FOR COMMENTS	
DAVID TRAVIS		DAVID.TRAVIS@USERFOCUS.CO.UK +44 20 7917 9535		SEPTEMBER 15TH	
PRODUCT UNDER TEST What's being tested? What are the business and experience goals of the product? <i>THE WEB SITE AT [TEST SITE TBA]</i>	TEST OBJECTIVES What are the goals of the usability test? What specific questions will be answered? What hypotheses will be tested? <i>DO PEOPLE UNDERSTAND THE VALUE PROPOSITION — THE CONCEPT OF AN ONLINE CONCIERGE SERVICE?</i> <i>DO PEOPLE TRUST THE SERVICE?</i> <i>DO THE EMAILS HELP PEOPLE PROCEED THROUGH THE VARIOUS STAGES?</i> <i>DO PEOPLE UNDERSTAND HOW TO CHOOSE A TIME SLOT ON THE BOOKING SCREEN?</i>	PARTICIPANTS How many participants will be recruited? What are their key characteristics? <i>6-8 PARTICIPANTS RECRUITED VIA PANEL.</i> <i>- ALL MUST BE IN FULL-TIME EMPLOYMENT</i> <i>- ALL MUST OWN A SMARTPHONE</i> <i>A MIX OF MEN AND WOMEN, HOMEOWNERS AND RENTERS.</i>	TEST TASKS What are the test tasks? <i>FIND OUT MORE ABOUT THE SCHEME AND DECIDE IF YOU WOULD SIGN UP FOR IT.</i> <i>SIGN UP FOR THE SERVICE.</i> <i>FIND A TRUSTED PLUMBER WHO CAN FIT YOUR NEW DISHWASHER.</i> <i>REVIEW THE OFFER AND ARRANGE A TIME FOR THE PLUMBER'S VISIT.</i> <i>COMPARE 3 ALTERNATIVE DESIGNS OF THE TIME SLOT BOOKING SCREEN PAGE.</i>	RESPONSIBILITIES Who is involved in the test and what are their responsibilities? <i>DAVID TRAVIS (PM, DATALOGGER)</i> <i>JANE HART (MODERATOR)</i> <i>PETER HUNTER (EYE TRACKING)</i> <i>JOHN KRAFT (CLIENT CONTACT)</i> <i>LES HEASMAN (TECH SUPPORT)</i> <i>LOUISE MANN (RECRUITMENT)</i>	
BUSINESS CASE Why are we doing this test? What are the benefits? What are the risks of not testing? <i>THE TEST WILL ADDRESS SEVERAL KEY QUESTIONS THAT THE DESIGN TEAM NEED ANSWERS TO FOR THE NEXT ITERATION. FAILING TO ANSWER THESE QUESTIONS NOW INCREASES THE RISK OF DEVELOPING THE WRONG PRODUCT.</i>		EQUIPMENT What equipment is required? How will you record the data? <i>LAPTOP WITH EYE TRACKING SOFTWARE AND MORAE TEST SOFTWARE.</i> <i>ALL SESSIONS WILL BE RECORDED TO DIGITAL VIDEO.</i> <i>WE WILL LOG USABILITY PROBLEMS AND MEASURE TASK COMPLETION RATE AND TIME ON TASK.</i>		LOCATION & DATES Where and when will the test take place? When and how will the results be shared? <i>SEP 23 @ USERFOCUS</i> <i>180 PICCADILLY, LONDON, W1J 9HF</i> <i>MAP: HTTP://GOO.GL/MAPS/87HKB</i> <i>PHONE DEBRIEF ON SEP 27TH</i>	

PROCEDURE

What are the main steps in the test procedure?



Time for More Questions & Discussion

- What we've covered in this section
 - Defining test purpose and concerns
 - Identifying test participants
 - Creating user profile questionnaire
 - Deciding on test method
 - Selecting tasks to be performed
 - Creating usability test tasks
 - Conducting a pilot test
 - Usability test plan
- Coming up
 - Observational test activities

Observational Test Activities

- Welcome participant
- Introduce the software
- Provide written tasks
- Observe participant
- Participant suggestions
- Test completion

Welcome the Participant

Greet the participant, and provide a high-level overview of the software product being tested

Welcome the Participant

Inform participants that the product's user interface is being tested, and not them

Welcome the Participant

Explain that you cannot provide help to the participant during the test, as this would bias the test results

Welcome the Participant

Provide a signed consent form, if appropriate

Welcome the Participant

- Other ethical considerations
 - Don't use the term “test subject”
 - Test participants can end the test at any time
 - Results will remain anonymous (use a participant coding scheme)

Introduce the Product

A brief preview or demonstration of the software product might be appropriate

Introduce the Product

Be sure that none of the elements included in the usability test are demonstrated or discussed

Activity: Compare Two Usability Test Introductions

Moderating Usability Tests:
Principles and Practices for Interacting - Videos
(Adobe Flash Required)

Introductions

Pre-Test Script

Pre-Test No Script

Reactions Pretests

Provide Written Tasks

Provide participants with a written copy of each task (one at a time) that you want them to try to perform

Provide Written Tasks

Remember, these tasks should be written more as scenarios describing specific goals, and not operational instructions

Observe the Participant

Carefully observe the participants as they try out your software, and have them indicate when they have completed each task

Observe the Participant

Consider having another person on your team take notes of actions each participant tries to perform with the software

Things to Watch Out For

- Inconsistencies between software and participants vocabulary
- Screens that participants visibly paused on
- The type and number of mistakes each participant makes

How to Make Your Observations Effective?

Let participants make mistakes

How to Make Your Observations Effective?

Record, but do not answer, questions (alternative is to answer them with questions)

How to Make Your Observations Effective?

Do not tell participants what to do!

How to Make Your Observations Effective?

Be careful not to give subtle cues, for example raising your voice often signals agreement

How to Make Your Observations Effective?

Try not to be defensive, remember you are trying to create a better user experience!

Handling Requests for Help

Reiterate in a very friendly manner that you cannot provide assistance, as doing so would bias the test results (note help requests)

Handling Requests for Help

If your initial response is not sufficient, state “Please remember, there’s no rush— take your time...”

Handling Requests for Help

If assistance is provided, clearly indicate in your notes when and where participant received help

Activity: Moderating a Usability Test — Asking for Assistance

Moderating Usability Tests:
Principles and Practices for Interacting - Videos
(Adobe Flash Required)

Introductions

Usability test interactions sample

Usability test interactions reactions

Participant Suggestions

Participants will often make specific suggestions regarding the usability issues that they encounter

Participant Suggestions

These suggestions should be reviewed, but not blindly followed as solutions to problems

Task Completion

- Once the test is complete, thank participants for their time and have them immediately fill out a post-test questionnaire before engaging in any follow-up discussions
- Provide participants with at least a token gift for their assistance

Post-Test Questionnaire

- A small number of rating scales
- Features to add/remove or best/worst features of interface (open ended)
- Blank “other” or “comments” field
- Consider including questions on each task sheet/card
- Use existing questionnaire when possible (e.g. Single Ease Question after each task, System Usability Scale after all tasks)
- Single Ease of Use Question

Single Ease of Use Question

- Overall, this task was?
 - Very difficult
 - Somewhat difficult
 - Neither difficult nor easy
 - Somewhat easy
 - Very easy

Create a Usability Test Script For More Consistent Test Activities

- Introduction
- Session details, including participant rights
- Check if participant has any questions
- Pre-test survey/questions (if applicable)
- Usability test tasks
- Post-test survey/questions (if applicable)
- Session wrap-up, including thanking participant

Time for More Questions & Discussion

- What we've covered in this section
 - Welcoming participant
 - Introducing the software
 - Providing written tasks
 - Observing participant
 - Participant suggestions
 - Test completion
- Coming up
 - Post-test activities

Post-test Activities

Summarize and present the results to your team, and consider sharing them with all project stakeholders

Post-test Activities

Ensure that there is time to use the results when conducting formative tests!

How to plan, conduct, and summarize usability tests?

Analysis and Reportings

Sharing Results - Brief Report

- Executive summary, including highlighting of positive attributes
- Methodology (participant profiles, test activities, and data collected)
- Key findings and recommendations

Key Findings and Recommendations

- List of major issues
- Prioritized recommendations (if appropriate)
- Task success matrix
- User quotes
- Post-test questionnaire results

Task Success Matrix

Task List	Task #1	Task #2	Task #3
User #1	Success	Success	Success
User #2	Success	Failure	Partial
User #3	Partial	Success	Success

Overall success rate = $(6 + (2 * .5)) / 9 = 78\% (7/9)$

Success vs. Failure

- Success
 - Participant was able to complete task without using on-line help or requesting assistance
- Partial
 - Participant had to use on-line help, or had to try one or more actions before succeeding
- Failure
 - Participant required help from facilitator, or was unable to complete requested task

Usability Test Report for a Summative Test

Common Industry Format (ISO/IEC 25062:2006)

- Title page
- Executive summary
- Introduction (full product description and objectives)
- Context of test (participants, tasks, environment, etc.)
- Experimental design (independent/dependent variables, measurements, procedure, general instructions, etc.)
- Results (data analysis, presentation of results , etc.)
- Appendices (detailed instructions, surveys, etc.)

Summary

- Testing Methods
 - Usability Testing Overview
 - Usability Test Formats
- Conducting Tests
 - Pre-test Activities
 - Test Activities
 - Post-test Activities
- Analysis and Reporting
 - Sharing Test Results

References and Suggested Books

- Elements of User Interface Design, by Theo Mandel
- The Usability Kit, by Gerry Gaffney and Daniel Szuc
- Usability Engineering, by Jacob Nielsen
- How To Specify the Participant Group Size for Usability Studies: A Practitioner's Guide, by Ritch Macefield (uxpa.org/jus/article/how-specify-participant-group-size-usability-studies-practitioner's-guide)

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<https://psmag.com/news/why-bad-ballot-design-is-a-really-significant-problem>

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