



Formative usability investigations for open-ended tasks

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Attendees at this session will learn:

- how our UX Team conducts contextual investigations and usability tests for open-ended tasks, with supporting examples

Overview

Background

Strategies for conducting open-ended investigations

Open-ended usability investigations: pros and cons

Background

What happened to Alias?

This presentation describes work that was done by the Alias User Experience team, based in Toronto, Canada.

After this presentation was accepted for UPA 2006, Alias was acquired by Autodesk, Inc. of San Rafael, California.

For that reason, the company name listed in your program will not match what you see on this screen.

Sorry for any confusion.



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Background

Our users, their work, & our software

We make award-winning 2D and 3D graphical software.
Our users are creative professionals.



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Background

Our UCD process

Our User Experience team:

- Our interaction designers are usability generalists
- We are assigned to a project from early development to release
- Each of us is assigned to one project at a time

- Formative usability investigations
- Agile design methodology



Background

What does “open-ended” mean?

A dictionary definition of “open-ended” is:

1. Not restrained by definite limits, restrictions, or structure.
2. Allowing for or adaptable to change.
3. Inconclusive or indefinite.
4. Allowing for a spontaneous, unstructured response.

- *The American Heritage® Dictionary of the English Language, 4th Edition*

Background

When is a task open-ended?

Which of these tasks are open-ended?

- Create a 3D model of a character for an animated film
- Organize your digital photographs
- Check for new messages on a voice mail system
- Withdraw money from a bank machine
- Add a 2D layer to an image file

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Background

When is a task open-ended?

Open-endedness depends on:

- Task domain
- Interface interaction
- What you're designing

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Background

Task domain

Tasks are more open-ended if:

- They are creative or generative
- They are ongoing, without a clear end-point
- External artifacts or environments can have an impact on them
- Individual users will approach them very differently
 - First-encounter use of a product
 - Learning tasks

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Background

Interface interaction

A task is more open-ended if it uses a UI with:

- Multiple methods to achieve the same thing
- Non-linear access to functionality, especially if order matters
- Interactive or real-time interaction (tools, manipulators)
- Non-standard or novel interaction

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Background

How open-ended are our users' tasks?

Task domain:

- Creative professionals
- Iterative tasks, often without a single clear end-point
- Ease of use and learning are product goals for some new applications, so discoverability and learnability are key issues

Interface interaction:

- Mostly tool- and manipulator-based real-time interaction
- Non-linear (and order of operation matters)
- Multiple methods to achieve the same thing
- Innovative UI

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Background

Challenges of open-ended investigations

For usability investigations of open-ended tasks:

- How to limit the scope of investigation
- If your product is a creative tool, how to investigate its use

For conducting usability testing of open-ended tasks:

- For a UI with open-ended interaction, how to avoid task bias
- For open-ended tasks, how to better simulate typical use
- How to give effective workflow direction while minimizing bias

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Background Strategies for open-ended investigations

- Explore
- Define
- Verify

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Exploring open-ended
task domains

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Exploring open-ended task domains

Motivation

Why contextual inquiry for open-ended task domains?

- Our UI interaction is open-ended, yet context-sensitive
- To promote the creative flow of our users we need to understand both their workflow, and observe actual interface interaction
- The UI interaction is highly data-dependent

Observation of actual use is critical

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Exploring open-ended task domains

Problem

Conducting contextual inquiry with creative professionals is difficult because:

- Workflow is intermittent
- Task timeframe can be very long
- Workflow interruptions are more disruptive
- Creative tasks are often very private

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Exploring open-ended task domains

Solution: Retrospective analysis

To ground research, we use specific work artifacts.

- Working files (our applications)
- Files used in other applications
- If applicable, external objects that relate to the workflow

There are two parts of the investigation:

- A. Identify work artifacts in an interview
 - Collect some workflow information
 - Ask the user to set up all the work artifacts in the order of creation
- B. Compressed retrospective walkthrough with users
 - User walks you through the high-level workflow using the artifacts
 - User demonstrates specific interaction details in real-time

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Solution: Retrospective analysis

A: Identify work artifacts in an interview

Determine

- Exact work files and other input into the workflow
- Context and order of creation
- Working versions?

Interview with internal domain experts

- Subject matter experts
- QA
- Support

Interview with user

- Phone
- In person (at your site, or during an early visit)
- Before, during, or after a usability test

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Solution: Retrospective analysis

B: Compressed retrospective walkthrough

Can be conducted

- At customer site, as part of contextual inquiry session
- In-house, before or after usability testing

Part 1: Demonstration of workflow, using the artifacts

Part 2: Demonstration of interaction, using either:

- a mid-point file (working forward towards next file)
- a less detailed version of the same type of work, using the same part of the interface

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Exploring open-ended task domains

Advantages of retrospective analysis

Recall the issues with CI and creative professionals:

- Workflow is intermittent
- Task timeframe can be very long
- Workflow interruptions are more disruptive
- Creative tasks are often very private

With this technique:

- Observe a compressed version of real-world work
- Don't interrupt creative flow
- Alleviate customer anxiety about privacy

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Exploring open-ended task domains

Advantages of retrospective analysis

Recall the reasons why CI is important for creative tasks:

- UI interaction is open-ended, yet context-sensitive
- To promote the creative flow of our users we need to understand both their workflow, & observe interface interaction
- UI interaction is highly data-dependent

With this technique:

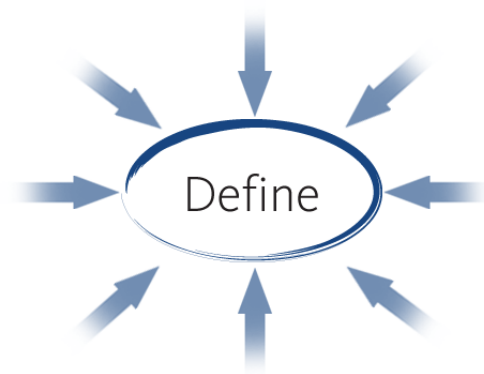
- If at site, get full environmental data
- Grounded in real-world examples and workflow
- You can observe detailed interactions
- Sometimes, you can pass on actual data to developers and QA

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Defining the
scope of inquiry

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Defining the scope of inquiry

Motivation

Why is it important to define the scope of inquiry for open-ended tasks?

- The more open-ended a task is, the easier it is to get sidetracked (both during design and usability testing)
- If we didn't, we couldn't have finished our designs or known that they worked

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Defining the scope of inquiry

Problem

What makes it hard to design & verify open-ended tasks:

- Figuring out what to design first, and order of implementation
- Selecting tasks for usability testing
- Prioritizing what to observe and measure in usability testing

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Defining the scope of inquiry

Solution: Design goals

Investigation (real use observation) →

Well-defined set of problems →

Design goals

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Design goals

Example: SketchBook Pro

- digital sketching program
- for use with Tablet PCs and computers that use a tablet

PC MAGAZINE
June 8, 2004
Motion M1400
Motion Computing
BEST BUY CHOICE



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Design goals

Example: SketchBook Pro

-ULTRA-LOW
CENTER OF GRAVITY
CONCEPT



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Design goals

Example: SketchBook Pro



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Design goals

Stating design goals

Example: Move/Rotate/Scale selection

Investigation showed:

- The three commands were really a single high-level task (position a selected area).
- Fairly common task, but not in the “first hour of use.”
- Used frequently in conjunction with layers.

Design goals:

- Reduce cursor travel when swapping between these functions. The interaction should feel natural and smooth.
- Users should be able to figure out how to position a selected area with out-of-box materials.
- Should work seamlessly with layers.

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Defining the scope of inquiry

Example: Using design goals

Design goals:

- Reduce cursor travel when swapping between these functions. The interaction should feel natural and smooth.
- Users should be able to figure out how to position a selected area with out-of-box materials.
- Should work seamlessly with layers.

Design and usability testing implications:

- Must create high-fidelity prototypes to verify kinesthetic qualities and ability to use with only a stylus.
- Must check learnability with prototype help.
- Must test a prototype that works with layers in the full application.
- The learnability and workflow (with layers) issues can be worked out after the kinesthetic issues.

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Defining the scope of inquiry

Example: Using design goals

Design goals:

- Reduce cursor travel when swapping between these functions. The interaction should feel natural and smooth.
- Users should be able to figure out how to position a selected area with out-of-box materials.
- Should work seamlessly with layers.

Types of usability testing tasks:

- Require positioning tasks that check all three modes.
- Find real-world positioning tasks using layers to check workflow.
- Include first-encounter use for learnability and discoverability.

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Defining the scope of inquiry

Example: Using design goals

Design goals:

- Reduce cursor travel when swapping between these functions. The interaction should feel natural and smooth.
- Users should be able to figure out how to position a selected area with out-of-box materials.
- Should work seamlessly with layers.

What are the usability acceptance criteria?

- Can users position a selected area the way that they want to?
- Is mode-switching impeding their workflow?
- Does the interaction feel smooth to users?
- Can they find the function, and figure out how to use it within 10 minutes with out-of-box materials?
- When combined with layer functionality, is the workflow still free?
- What is the perceived ease of use?

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Defining the scope of inquiry

Advantages of design goals

Recall why it's important to define the scope of open-ended tasks:

- To avoid getting sidetracked during design and usability testing
- Otherwise, you can't finish your designs or know that they work

Recall issues designing and verifying open-ended tasks:

- Figuring out what to design first, and order of implementation
- Selecting tasks for usability testing
- Prioritizing what to observe and measure in usability testing

Design goals assist all these issues.
They are a roadmap.

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Usability testing open-ended tasks

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Usability testing open-ended tasks

Motivation

Why should tasks that are more open-ended be usability tested any differently?

- Since we are designing for real-world use, we wanted to usability test in situations to verify real-world behaviour.
- Scripted usability tasks often set unrealistic constraints on user behaviour that don't match the open-ended nature of the task.
- Result: task bias.

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Usability testing open-ended tasks

Problem

Challenges with usability testing open-ended tasks:

- In a product where users can “do anything,” getting them to do what you need to observe them doing....
- ... Yet for open-ended tasks, watching testers using the product as they would in the real world.
- Striking the balance between observational rigour and a more natural user interaction.
- Low-fidelity usability testing of open-ended tasks.

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Usability testing open-ended tasks

Some solutions

- A. Progressive definition of real world tasks
- B. Open-ended task direction
 - Modes for presenting open-ended usability tasks
 - Using work artifacts as transitional task leads
- C. Building and testing low-fidelity prototypes for open-ended tasks

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Solution A

Progressive definition of real world tasks

Derived from work with Agile UCD practices

- In Agile methodology, you create incremental mini-releases
- When designing, we create incremental mini-designs
- To test these, we use testers who progressively get closer to our end users

We're iterating on designs and users -- why not tasks?

...For more information on our work in Agile UCD, see:

- Miller, L., "Case Study of Customer Input for a Successful Product", Agile 2005 Conference Proceedings, 2005, Denver, CO.
- Sy, D., "Strategy and tactics for Agile design: a design case study", UPA 2005 Conference Proceedings, 2005, Montréal, Québec.

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Solution A

Progressive definition of real world tasks

- While validating early, non-workflow-specific design goals, use arbitrary, closed tasks
- After these validations, interview testers to figure out more representative tasks, with the appropriate context
- Use these more real tasks in later usability testing to validate workflow-specific design goals

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Solution A

Progressive definition of real world tasks

Example: Move/rotate/scale selection in SketchBook Pro

- Low-fidelity task 1: position shapes within outlines
- Higher-fidelity task 2: copy a sketch fragment

Real-world activities:

- Position and scale character on background
- Position and scale a reference image to trace

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Solution A

Advantages of progressive task definition

Recall reasons to test open-ended tasks differently:

- Since we are designing for real-world use, we wanted to usability test in situations to verify real-world behaviour.
- Scripted usability tasks often set unrealistic constraints on user behaviour that don't match the open-ended nature of the task.

With this technique:

- Elicit real-world usability activities
- (In fact, it's a way to sneak contextual inquiry into a usability test)
- When you elicit these activities from end users, if you're doing longitudinal testing, you can use real-world data to drive tasks

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Solution B

Open-ended task direction

- Instead of providing written instructions for a usability task, start from a high-level activity that covers all the tasks to validate
- Your "protocol" is the list of acceptance criteria to validate, derived from the design goals
- Let **testers** lead the session, and see where they go
- Only if you haven't got the validation data that you need should you attempt to redirect towards a particular task
- To intervene, redirect towards a task or user goal, **not** a behaviour or action
- Relate the "new" task to a previously demonstrated action

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Solution B

Open-ended task direction

Example: Move/Rotate/Scale selection

Activity:

- Position and scale character on background

Acceptance criteria:

- Can users position a selected area the way that they want to?
- Is mode-switching impeding their workflow?
- Does the interaction feel smooth to users?
- Can they find the function, and figure out how to use it within 10 minutes with out-of-box materials?
- When combined with layer functionality, is the workflow still free?
- What is the perceived ease of use?

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Solution B

Open-ended task direction

Need design goals first

- Otherwise, you will not be able to redirect effectively

Activities

- You need at least one representative activity to start
- You should be fairly certain that you'll hit the required tasks
- You often will find more activities as you progress

Modes for presenting open-ended usability tasks

- Match the mode of the real activity

Using artifacts as transitional task leads

- If users bring in work files, you can judge which activities to direct them towards

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Solution B

Open-ended task direction

Testing with open-ended task direction is useful when:

- Exploring first-encounter use
- Testing the learnability of a design
- Testing the discoverability of a design
- Testing a product with an open-ended interaction
- Specifying a specific output is antithetical to your users' workflow
- Learning about unusual ways your users use your product

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Usability testing open-ended tasks

Advantages of open-ended task direction

Recall problems with observing open-ended tasks:

- In a product where users can “do anything,” getting them to do what you need to observe them doing....
- ... Yet for open-ended tasks, watching testers using the product as they would in the real world.

With this solution

- You **start** from the real world use, and then redirect them to areas of concern, resulting in less task bias
- Better model of user behaviour, so better design verification
- There's a lot of flexibility and fluidity; you can adapt to how your tester works, and react to new design problems that arise
- Because of the design goals, high confidence in the completeness of the data

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Solution C

Low-fidelity testing of open-ended tasks

For highly interactive UIs

- Interactive and tool-based → whiteboard prototypes
- Design goals → focus on subset of the interface
- “Hybrid” fidelity prototypes

For highly unpredictable data

- Conduct pre-test interviews to narrow the conditions for the data (not validated)
- Screen users through interviews to match your prototype data

Spool, J. “Interview-based tasks”, User Interface Engineering
http://www.uie.com/articles/interview_based_tasks/

Open-ended usability investigations: pros and cons

Usability testing open-ended tasks

What are “usability investigations”?

Agile UCD forced us to re-think the idea of contextual inquiry, interviews, & usability testing as distinct activities

To be Agile, we needed to

- design faster
- design incrementally
- design just-in-time

To be user-centred designers, we needed to

- conduct contextual inquiry
- iterate as often as necessary
- test our designs in a valid context

To maximize the data we collect per session

- **blend the three activities**

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Usability testing open-ended tasks

What are “usability investigations”?

Customer (“Design partner”) investigations

- retrospective analysis focused on future designs
- 2 to 4 usability tests of various prototypes for current designs (open-ended task direction)
- additional interviewing as needed in the session

In-house usability investigations (with external users)

- retrospective analysis focused on current designs
- usability test involving 1 to 4 activities using various prototypes (open-ended task direction)
- additional interviewing as needed in the session

In-house usability investigations (with internal users)

- usability test with current prototype
- interviews about workflow and our customers

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Contextual investigation of open-ended tasks

Challenges

- Investigation is more iterative and longitudinal
- Data is intermittently gathered and heterogeneous
- Need tight communication between ethnographers, designers, and usability test facilitators
- Most common error...

Not doing it.

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Contextual investigation of open-ended tasks

Advantages

- Lets you articulate design problems from real world data
- Cannot form design goals without this data
- Lets you focus the scope of your design
- Lets you limit the range of inquiry for formative usability testing
- Gives your initial set of usability test tasks
- Informs all other aspects of product design
 - Acceptance criteria for development, QA, documentation, marketing
 - Work files for development, QA
 - In Agile development, feeds directly into product planning

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Open-ended usability testing

Challenges

- More dependent on facilitator skill than scripted usability tests
- Facilitator must understand the design intent thoroughly
- Facilitator should understand the design history continuity
- Works better if there's a second observer
- The test results are not statistically significant
- Little or no data on uncommon and non-critical tasks

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Open-ended usability testing

Advantages

- The tasks are more representative, so it's better verification
- Uncompromised data on learnability and discoverability
- Allows contextual investigation during verification sessions
- Rich input into task-based documentation
- Rapid and responsive for higher design velocity

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Summary

Some tasks are more open-ended than others

- Task domain
- Interface interaction
- Design intent

Explore creative task domains

- Retrospective analysis

Define the scope of inquiry

- Design goals

Usability test designs for open-ended tasks

- Progressive definition of real-world tasks
- Open-ended task direction

Blend contextual inquiry, interviews, & usability testing

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Questions?

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