

Contribution Types and Evaluation Methodology

Sept 10, 2018

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User studies vs. HCI research

User studies

Goal: create best possible end product
Results typically useful to product team

HCI research

Goal: generate new knowledge
Results / outcomes valuable to those outside of specific product team

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Contribution Types

[Wobbrock and Kientz, 2016]

1. Empirical
2. Artifact
3. Methodological
4. Theoretical
5. Dataset
6. Survey
7. Opinion

} Most common

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Empirical

New knowledge from findings based on data



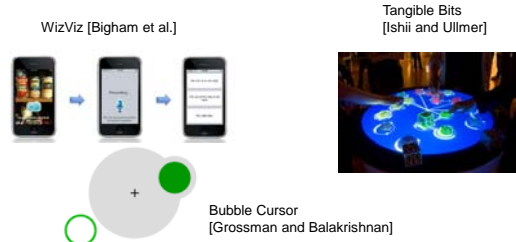
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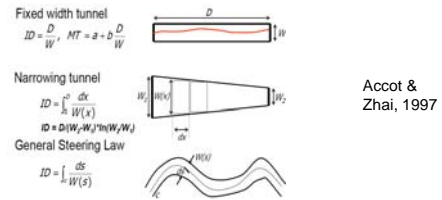
Artifact

Knowledge from generative design-driven activities



Theoretical

New/improved concepts, definitions, principles or frameworks



Methodological

New knowledge about how to carry out HCI work (research or practice)

Evaluation Methods: Overview

- Strategies
- Data
- Analysis
- Validity
- Ethics

Goals

When gathering data for an evaluation, the ultimate goal is to maximize

- Generalizability
- Precision
- Realism

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Goals

Is it possible to simultaneously maximize generalizability, precision and realism?

Why / why not?

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Types of Evaluation Methods [McGrath]

- Experimental strategies
- Sample surveys
- Field strategies
- Theoretical strategies

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Experimental Strategies

- Participants are brought to a laboratory environment
- Asked to perform a number of tasks
 - Can involve a realistic simulation (e.g., driving simulator)
- Performance measured
- Benefits and drawbacks?

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Sample Survey

Participants are polled for the attitudes, opinions, beliefs

or tested for knowledge

Questionnaires can be distributed to large numbers of people

Interviews to elicit more detailed info or for more exploratory purposes

Benefits/drawbacks?

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Field Strategies

Field study

Study conducted in its natural environment

Field experiment

Introduces some manipulation

Benefits/drawbacks?

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Computer Simulations

Trying to simulate environments, etc. for the purpose of increase realism

Benefits/drawbacks?

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Data

Where does it come from?

What "form" is the data?

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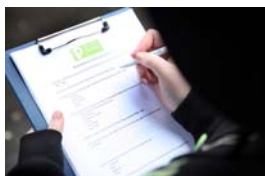
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Data:

Where does it come from?

Self-reports



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Data:

Where does it come from?

Observation



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Data

Where does it come from?

Other types

Archives

Trace data



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Data: What "form" is it?

Two types

1. Quantitative
2. Qualitative

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Analysis: Quantitative

Descriptive statistics

Mean, standard deviation, median, frequency, etc

Issue: Needs a baseline to be meaningful

Correlation

Does a change in one variable of interest covary with others

Issue: Correlation does not imply causation

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Analysis: Quantitative

Differences:

Is there is difference between two groups?

Typically involves hypothesis testing

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Analysis: Qualitative Data

Focus is on providing rich descriptions

Techniques

Coding

Thematic analysis

Building models (from Contextual Design)

Quantitative analysis is also possible

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Designing a Study

There is no one right evaluation strategy or data collection technique

Each has its own strengths and weaknesses

So how do you choose?

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Designing a Study: Considerations

Research question and/or anticipated contribution

Logistics

Cost

Availability of participants

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Designing a Study: Considerations

There is no perfect method

Whatever you choose it is important to:

Strive to apply the method correctly

Understand its strengths and weaknesses

Be honest about which conclusions can be made

Be open about any limitations

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Combining Methods

A combination of strategies and techniques is preferred

Allows for different perspectives

Each tells the story from a different viewpoint (triangulation)

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Combining Methods

The goal is to combine methods over a **body of work**

Applying a even single method takes significant resources

E.g., a small laboratory study can take months

Exploring the generalizability of a phenomena across methods can be one form of contribution

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Research with human subjects: ethical issues

Participants have a right to:

- know the goals of the study
- know what will happen to the findings
- have their personal information kept private
- not be quoted without their agreement
- leave when they wish
- be treated politely

Informed consent is a must

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Ethics Approval

Research with human subjects conducted for the purpose of publication must be approved by the human ethics board

Requires submitting a protocol (~10 pages)

Review time is typically 4-6 weeks

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In readings throughout term

Appropriate method(s) for research question or intend contribution?

Appropriate application?

Appropriate conclusions?

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Next Class

High-level overview of controlled experimentation

Background reading: Dix et al paper

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