CPE/CSC 484:
User-Centered Design and Development

Franz J. Kurfess

Computer Science Department

California Polytechnic State University

San Luis Obispo, CA, U.S.A.

Logistics

- **Senate appearance by the instructor**
  - during the first half of the lab period

- **Assignments**
  - A3 - Storyboards deadline Thu, May 3

- **Term Project**
  - mid-quarter project displays Thu, May 3
  - allocation of display stations
  - external visitors anticipated
    - don't reveal confidential information
      - e.g. names of collaboration partners

Tuesday, May 8, 12

Chapter 12

Introducing Evaluation

Tuesday, May 8, 12

Motivation

- provide an overview of usability evaluation
- introduce the context, terms, and concepts used

Tuesday, May 8, 12

Objectives

- Discuss how developers cope with real-world constraints.

- Explain the concepts and terms used to discuss evaluation.

- Examine how different techniques are used at different stages of development.

Tuesday, May 8, 12

The aims

- Explain the key concepts used in evaluation.
- Introduce different evaluation methods.
- Show how different methods are used for different purposes at different stages of the design process and in different contexts.
- Show how evaluators mix and modify methods.
- Discuss the practical challenges
- Illustrate how methods discussed in Chapters 7 and 8 are used in evaluation and describe some methods that are specific to evaluation.

Tuesday, May 8, 12

Why, what, where and when to evaluate

Iterative design & evaluation is a continuous process that examines:

- Why: to check users' requirements and that users can use the product and they like it.

- What: a conceptual model, early prototypes of a new system and later, more complete prototypes.

- Where: in natural and laboratory settings.

- When: throughout design; finished products can be evaluated to collect information to inform new products.

Tuesday, May 8, 12

Bruce Tognazzini tells you why you need to evaluate

"Iterative design, with its repeating cycle of design and testing, is the only validated methodology in existence that will consistently produce successful results. If you don't have user-testing as an integral part of your design process you are going to throw buckets of money down the drain."

See AskTog.com for topical discussions about design and evaluation.

Tuesday, May 8, 12

Types of evaluation

- Controlled settings involving users, eg usability testing & experiments in laboratories and living labs.

- Natural settings involving users, eg field studies to see how the product is used in the real world.

- Any settings not involving users, eg consultants critique; to predict, analyze & model aspects of the interface analytics.
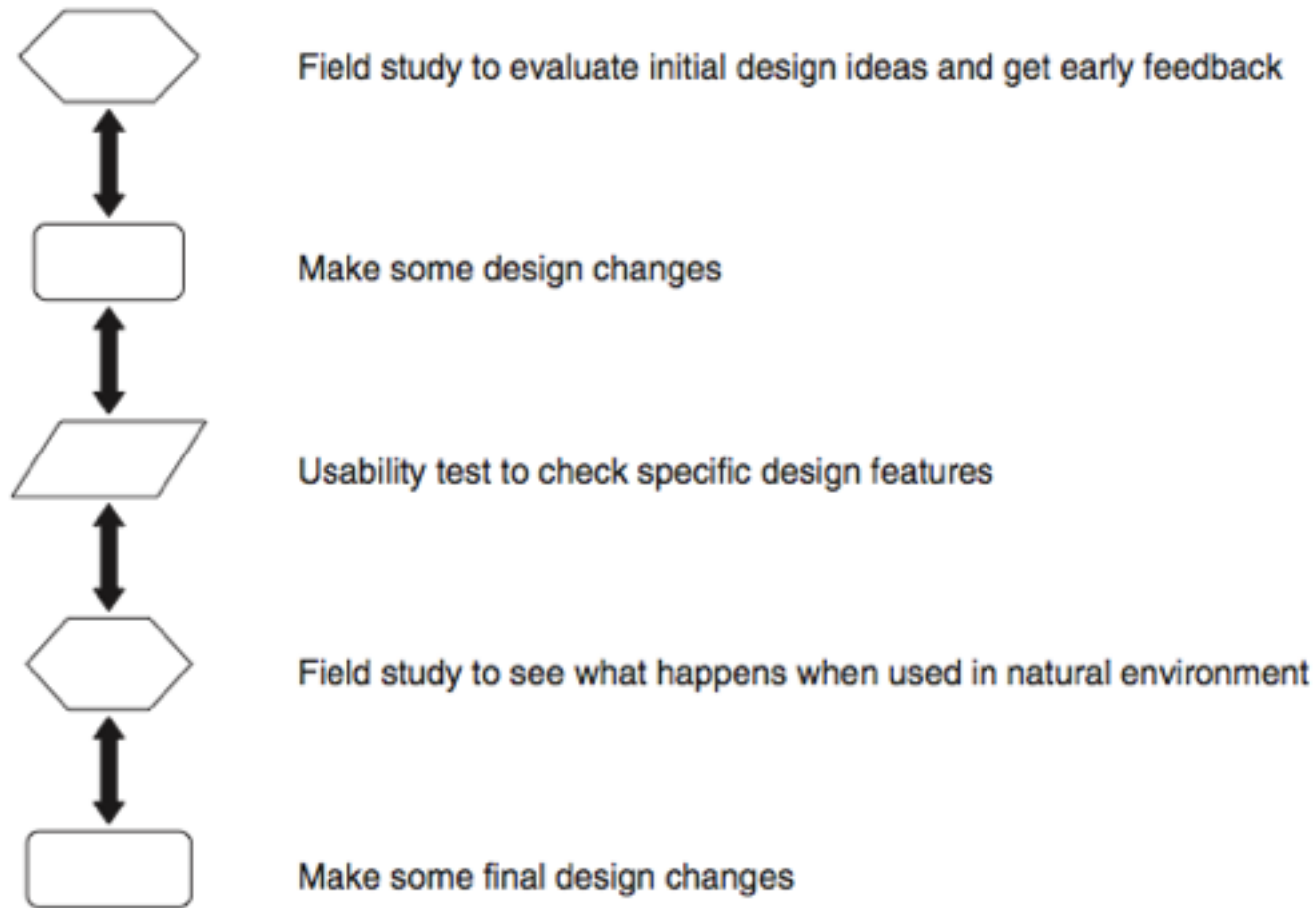
5

Tuesday, May 8, 12

Usability lab

http://iat.ubalt.edu/usability_lab/

Tuesday, May 8, 12

Living labs

- People's use of technology in their everyday lives can be evaluated in living labs.

- Such evaluations are too difficult to do in a usability lab.

- Eg the Aware Home was embedded with a complex network of sensors and audio/video recording devices (Abowd et al., 2000).

Tuesday, May 8, 12

Usability testing & field studies

Field study to evaluate initial design ideas and get early feedback

Make some design changes

Usability test to check specific design features

Field study to see what happens when used in natural environment

Make some final design changes

Tuesday, May 8, 12

Evaluation case studies

- Experiment to investigate a computer game

- In the wild field study of skiers

- Crowdsourcing

Tuesday, May 8, 12

Challenge & engagement in a collaborative immersive game

- Physiological measures were used.

- Players were more engaged when playing against another person than when playing against a computer.

- What precautionary measures did the evaluators take?

10

Tuesday, May 8, 12

What does this data tell you?

high values indicate more variation

	Playing against computer		Playing against friend	
	Mean	St. Dev.	Mean	St. Dev.
Boring	2.3	0.949	1.7	0.949
Challenging	3.6	1.08	3.9	0.994
Easy	2.7	0.823	2.5	0.850
Engaging	3.8	0.422	4.3	0.675
Exciting	3.5	0.527	4.1	0.568
Frustrating	2.8	1.14	2.5	0.850
Fun	3.9	0.738	4.6	0.699

Source: Mandryk and Inkpen (2004).

Tuesday, May 8, 12

Why study skiers in the wild ?

Jambon et al. (2009) User experience in the wild. In: Proceedings of CHI '09, ACM Press, New York, p. 4070-4071.

Tuesday, May 8, 12

e-skiing system components
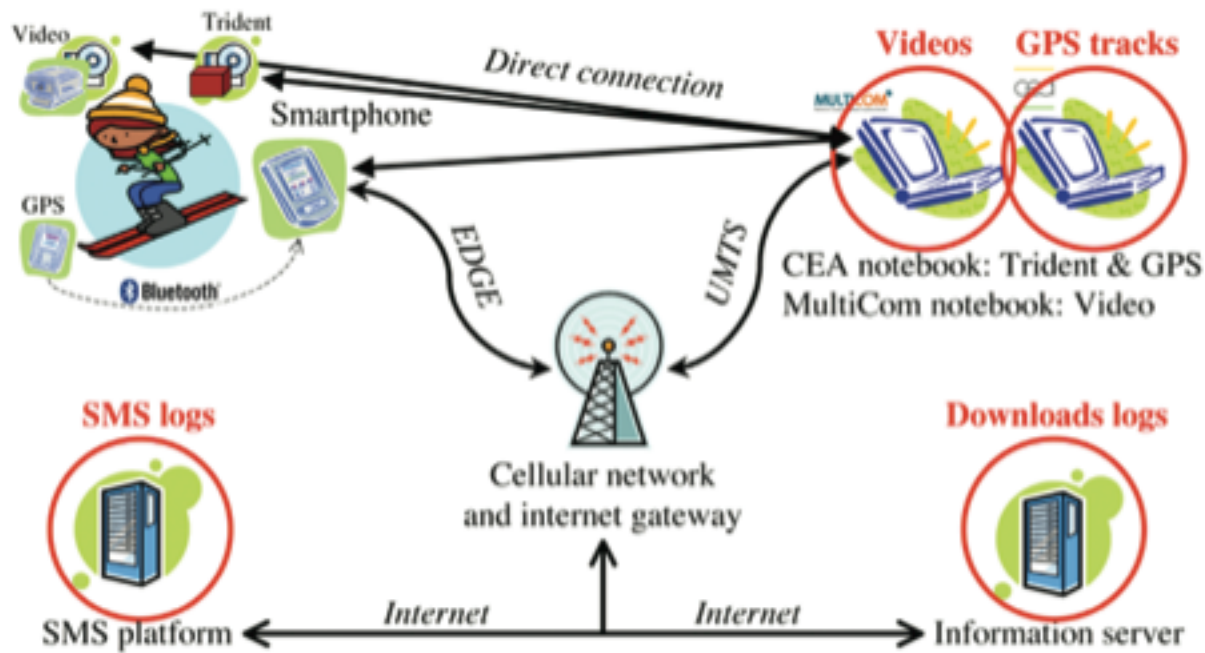
Jambon et al. (2009) User experience in the wild. In: Proceedings of CHI '09, ACM Press, New York, p. 4072.

Tuesday, May 8, 12

Crowdsourcing-when might you use it?

Tuesday, May 8, 12

Evaluating an ambient system

- The Hello Wall is a new kind of system that is designed to explore how people react to its presence.

- What are the challenges of evaluating systems like this?

Tuesday, May 8, 12
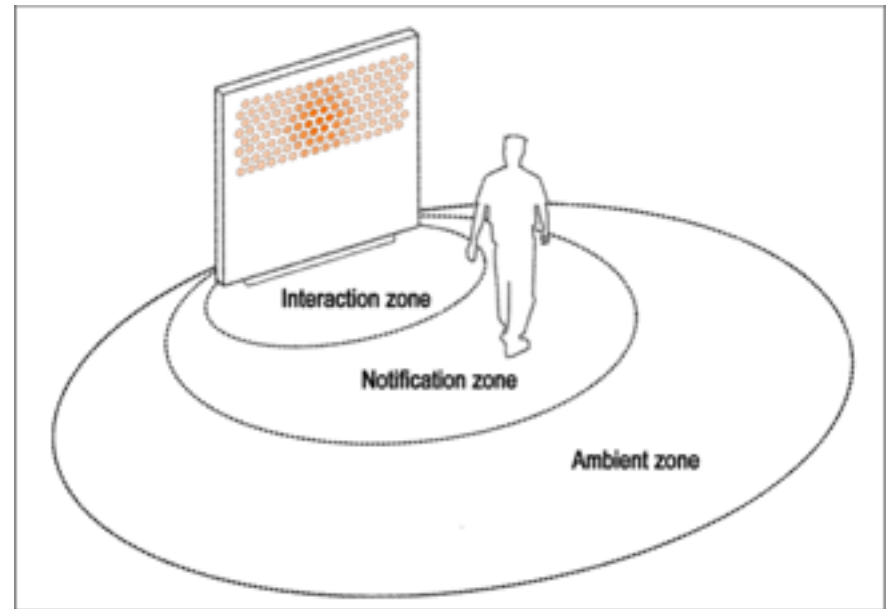
Evaluation methods

Method	Controlled	Natural settings	Without users
Observing	x	x	
Asking users	x	x	
Asking experts		x	x
Testing	x		
Modeling			x

Tuesday, May 8, 12

The language of evaluation

Analytics

Analytical evaluation

Controlled experiment

Expert review or crit

Field study

Formative evaluation

Heuristic evaluation

In the wild evaluation

Living laboratory

Predictive evaluation

Summative evaluation

Usability laboratory

User studies

Usability testing

Users or participants

Tuesday, May 8, 12

Key points

- Evaluation & design are closely integrated in user-centered design.
- Some of the same techniques are used in evaluation as for establishing requirements but they are used differently
  - (e.g. observation interviews & questionnaires).
- Three types of evaluation: laboratory based with users, in the field with users, studies that do not involve users
- The main methods are: observing, asking users, asking experts, user testing, inspection, and modeling users' task performance, analytics.
- Dealing with constraints is an important skill for evaluators to develop.

Tuesday, May 8, 12

A project for you ... continued

- Read Tog's account and look at the picture of the ballot card.

- Make a similar ballot card for a class election and ask 10 of your friends to vote using the card. After each person has voted ask who they intended to vote for and whether the card was confusing. Note down their comments.

- Redesign the card and perform the same test with 10 different people.

- Report your findings.

Tuesday, May 8, 12