



Participatory Design through Games and Other Group Exercises

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OBJECTIVES OF THE TUTORIAL

The tutorial is intended to teach selected methods in participatory design through applied, hands-on exercises, with lecture material used to introduce and supplement the exercises. A single domain will be used to unify the contents of the exercises. The conception of games will be used to unify the analysis and presentation of group design exercises.

INTENDED AUDIENCE

This tutorial is intended primarily for designers and developers at an intermediate level (some experience in design activities). However, the introductory material and the hands-on nature of the exercises make it accessible to other stakeholders in the design process (e.g., users, managers, documenters, analysts). We especially welcome users and other non-traditional participants.

COURSE CONTENTS

Rationale — Lecture. We explore motivations for choosing group design instead of individual design, and for the use of games to facilitate group work. Group design is becoming more important as organizations try to bring diverse talent and expertise into design, and as they try to bring users and other stakeholders into the design process. Games are helpful because they provide a familiar, relaxed, and relatively egalitarian atmosphere within which the stakeholders can combine their diverse backgrounds to develop new solutions and to meet one another's needs. These attributes are particularly important when software professionals and users form design teams for relatively brief design exercises.

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Taxonomy of Participatory Design Techniques — Lecture.

We provide background and context for participatory design, based in part on the June 1993 *Communications of the ACM* issue on participatory design [7; see also 1,4,8,10,11]. We will anchor our analysis of PD techniques in the taxonomy published in that volume [9]. This helps to show how our games can fit within the software development process. It also helps tutorial participants to make informed choices among a variety of participatory design techniques, in addition to those that we present in this tutorial.

Problem Definition — Lecture. We describe a fictitious software system to support on-line food shopping.

Interface Metaphors Game — Small Group Exercise. Then, for several potential features of the on-line system, each group will be assigned the task of rapidly developing a high-level conceptual design for a new version of the system. This will be done through an attribute-matching game involving metaphors. Possible analogies range from common user interface metaphors (e.g., spreadsheet, daily calendar) to less conventional ones (e.g., roadmap), and are intended both to support specific user interface devices and to reconceptualize the tasks. A comparison of the resulting designs will illustrate both (a) the impact of the designers' mental model upon the design, and (b) the importance of an appropriate match between the characteristics of the data and user's task and the metaphor for representing them. We also discuss how to elicit novel metaphors.

Task Analysis: CARD Game (Collaborative Analysis of Requirements and Design) — Small Group Exercise. Each group will develop a high-level task flow for the system. This will be done using the CARD technique [12,13], a task analytic and design critique game that uses cards to represent task activities. Each card represents an event within the system, a workplace event that takes place outside of the system, a user action, or a user cognitive or motivational state or event. Thus, CARD supports both procedural and cognitive aspects of task analyses. Our presentation of the CARD technique will include videotapes of actual CARD sessions and assessments from work in several companies, before the hands-on CARD exercise.

Icon Design Game — Small Group Exercise + Whole Group Observed Competition. Designing usable icons is a notoriously difficult task, particularly when the intended referent is a process or abstraction, or when many objects in



a set are physically similar. How can we generate designs for meaningful icons? One solution is the competitive and informal environment of a popular board game. In the board game, competitors provide clues to word identity by drawing pictures. In our extension of the game, one member of each team (the "Sketcher") is given a command or object name, a software context, and a few seconds to think before attempting to draw the concept. At the completion of each round, teams review the sketches to pinpoint the features that provided the best cues. A number of follow-up activities are described which address animation of icons, size and resolution constraints, and usability ratings of icon designs.

PICTIVE — Small Group Exercise. The PICTIVE (Plastic Interface for Collaborative Technology Initiatives through Video Exploration) technique [5,6] will be applied to two subproblems within the design domain (one graphical, and one textual). Participants will design the relevant aspects of the interface using paper and pencil techniques for a type of "rapid prototyping" without using a software prototyping environment. The focus of this exercise is on the relatively equal participation of all team members in the design activity, and the separate and unique contributions that each participant's expertise and background can make to the collaborative design effort. Our presentation of the PICTIVE technique will include videotapes of a PICTIVE instructional "skit" and assessments from work in several companies, before the hands-on PICTIVE exercise.

Interface Theater: Interactive Design Walkthroughs for Very Large Stakeholder Groups — Whole Group Exercise.

One design will be enacted in the form of a play, using humans to take the part of scripted components of the system (e.g., Marty the Menubar, Dana the Dialogbox, Pat the Pixelmaster). Each actor carries appropriate props, which we provide. Actors' portrayals are guided by "object oriented scripts," in which the actors' cues are mapped to the object-oriented concept of messages and actors' words and actions are mapped to the concept of methods. The "audience" of the play (i.e., users and other stakeholders) will critique the plot, action, and props. The play can then be re-enacted on the basis of the audience's suggestions [2,3].

BACKGROUNDS OF INSTRUCTORS

Michael J. Muller is a Member of Technical Staff in the Human Interface Design and Research group in the Applied Research and Multimedia Services department at U S WEST Advanced Technologies, where he explores participatory design techniques and the application of new user interface technologies to telecommunications applications. He and Sarah Kuhn co-edited the June 1993 issue of *Communications of the ACM* on participatory design [7].

Daniel M. Wildman is a Member of Technical Staff in the Usability Analysis group in the Network Planning and Distribution Systems department at Bellcore, where he practices user centered design and participatory design of icon libraries and databases, and prototyping for GUIs.

Ellen A. White directs a group at Bellcore that is responsible for the Bellcore Graphical User Interface Style Guide, as well as requirements definition and usability engineering for workstation software components that are used by multiple applications.

The three authors facilitated related tutorials at CHI'92, INTERCHI'93, and HFES'93, and an earlier version at HFS'91.

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