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## 'Equal Opportunity' PD Using PICTIVE

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**P**ICTIVE (Plastic Interface for Collaborative Technology Initiatives through Video Exploration) is a low-tech PD technique that has been used on products and research projects [4, 5, 7].

PICTIVE was a response to two PD trends: rapid prototyping and the Scandinavian mock-up approaches. Unlike rapid prototyping, PICTIVE does not involve a *technology* environment for design activity (e.g., Halskov, Madsen and Aiken, this issue). In rapid prototyping, the users often must express their ideas through an intermediary—the developer

## Graphic Facilitation

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**R**eal work is not done in procedures manuals or workflow charts. People do work with movement, sound, thought, words, and sometimes passion in living color. Graphic facilitation, a conceptual analysis methodology used for 10 years, captures important and meaningful elements of work from the worker viewpoint. This technique is meant to be used with other more structured techniques. These visual working sessions give designers a record of work in a few days. The raw data from these sessions have enabled product designers to produce system designs in a few weeks.

Graphic facilitation sessions work this way: The facilitator plans the working sessions with key people in the design team and work group. They develop a working session plan, outlining group process and graphic formats. The physical site for the working sessions is set up in advance with butcher paper panels about 8- to 10-feet long and 4-feet high taped to the walls. Lots of colored pens are placed around the room. Technology can be used for recording, but tends to distract from group interaction.

During the session, the facilitator's role is to guide the workers in exploring their project. Freeform storyboards are usually the first step. The workers are encouraged to tell the "story" of their work in their own words. The key people, procedural steps, important systems support functions, feelings and stresses are recorded. The graphic facilitator asks questions and encourages the workers to talk. Simultaneously, the facilitator or a separate recorder captures the story on the walls covered with paper in simple images, shapes, key words and phrases. The facilitator and recorder DO NOT change the words of the workers or editorialize. Later steps in the session plan will clarify and analyze information necessary to design new technology systems and the corresponding organizational improvements.

**What do designers get from having work illustrated graphically?**

- *A selective record about work.* Video tapes and lengthy interviews sometimes provide so much data, key concerns of workers can be missed. Storyboards, wall paintings and other graphics help workers focus on the essential elements of the work process.

For example, a team was lost in the redesign of a complex front-end transaction-processing system. The central design theme of the system was identified when a worker finally said in a session, "All I want to know is the source of any errors!" The system was redesigned to focus on preventing and isolating errors rather than cranking out reports.

- *Encourages long-term memory of important elements of work without cumbersome written documents.* Workshop participants remember even detailed content of the sessions because the graphic records are in color and large (usually 4- by 8 feet.) Participants in sessions can readily recall what happened

or designer who may be the only participant who understands the prototyping environment. Thus users may have *less direct participation* than the software professionals. The mock-up tradition addresses this problem by using low-tech artifacts that do not put users at a disadvantage [2]. However, mock-ups have tended to be used to support user critiques of the developers' ideas: the users are thus placed in a reacting mode, rather than an initiating one. Like other mock-up approaches, PICTIVE uses low-tech objects. Unlike most other mock-up approaches, PICTIVE does so in

a *process* that puts more of the initiative directly in the users' hands. The goal is to provide an equal opportunity design environment<sup>1</sup> in which all participants can contribute as peer codesigners.

The **PICTIVE object model** consists of common office objects, such as colored pens and Post-It™ notes, as well as scissors and removable tape for tailoring those materials. These low-tech objects are intended to be mapped onto computer functionality, usually as user interface objects. The materials may be supplemented with customized objects, such as proposed icons, or paper repre-

sentations of components of a windowing environment [5].

Under the **PICTIVE process model**, these low-tech objects are used by *all* participants to express their ideas to one another. Each participant is responsible for explaining her or his personal and/or professional stake in the design, and for explaining her or his special expertise. This may take the form of a minitutorial, or a demonstration of a prototype that was developed following earlier sessions. Usually guided by the users' narrative of their task flow, the group then uses the low-tech objects to brainstorm ways of adapting technology to the users' work process; these discussions may also lead to changes in the work process itself, with or without technology interventions. Often, diverse domains and perspectives are communicated through the concrete, low-tech artifacts. Each session concludes with a short design walk-through, captured on video. This helps to focus the group's achievements, building mutual commitment and collective competence. It also provides a video "minutes of the meeting" that can communicate the group's design to developers or to other groups (e.g., when multiple stakeholder groups are geographically separated).

The **PICTIVE participation model** contains three convergent guidelines for deciding who participates in a PICTIVE session. First, *diverse expertise* contributes unique knowledge to the design. Second, all phases of the software life cycle are likely to be facilitated by the enfranchisement and co-ownership of people who are "downstream" from the design process. Third, we follow the democratic concept that people whose work lives will be influenced by a design should participate in decisions about that design [1, and Miller, this issue] adapted for our North American corporate culture. These three motivations together argue for the potential inclusion of the *same* stakeholders in the design: users, developers, human factors workers, technical writers, systems analysts, trainers, and marketers. All of these groups have unique expertise to offer. All can make a difference if they are committed to the design. And all will have their work lives influenced by the design, in one way or another.

PICTIVE has been used in the design of telecommunications software products, including a facilities allocation system, a personnel assignment system, a software maintenance system, and a large provi-

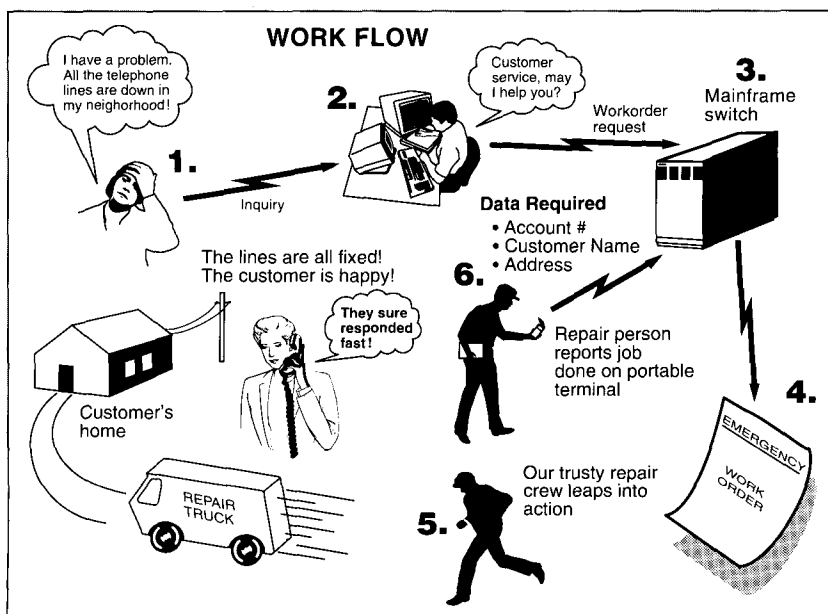
in the sessions by a brief reference to a file-sized copy of the original graphics. In one case, a designer and worker were able to recall how a disagreement over design was settled a year after a working session by recalling "that agreement we worked out in the green lettering."

• *The facilitative process is tailored to the needs of workers and designers.*

Graphic facilitation requires the group leader to be "neutral" to the outcome of the sessions and act as a support to participants. The response to the graphic sessions is usually excitement, and professional satisfaction with getting to the heart of worker needs in a fast and efficient process.

• *Greater insight into the motivational aspects of work.* Flowcharts and linear models do not capture the frustration of a customer service worker who has an angry customer on the line and it takes five screens to get to the information they need. The facilitators make sure to record the human expressions of work. A "happy" or "angry" face within a storyboard reinforces the concept that work is fundamentally a human activity. A customer or a worker has to be satisfied with the results of the work. Computers do not just exist in a vacuum.

Workers' reactions to systems designed and built applying the graphic facilitation technique is closer to "love" than "user friendly." When the workers see their ideas (as recorded in the working sessions) built into the technical system, the reaction is complete ownership and acceptance. Designers of these systems tend to be recognized by getting promoted. ■



sioning application. It has also been used to design experimental groupware, tutoring, and information retrieval software projects, and has been part of several curricula for user-centered design, taught by I71 and by others.

Participant response has been highly favorable (see I41 for assessment results). The major failing of PICTIVE is that it often encourages a premature focus on detailed design, without supporting a critical participatory analysis of higher-level issues, such as task flow. The recently developed CARD technique (Collaborative Analysis of Requirements and Design) addresses this problem through low-tech card-like artifacts [6] that focus

on *user actions* rather than on computer artifacts. We are developing a practice in which we combine the micro-level analysis of PICTIVE with the macro-level analysis of CARD—complementary techniques that provide a form of “bifocals for PD.”

□

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<sup>1</sup>PICTIVE does not attempt to redress the general workplace issue of unequal access due to disability conditions. However, the development of group or collective competence helps the group to support the contributions of each participant, regardless of disability condition, by combining their ideas and their expressive capabilities.

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