TECHNICAL RESEARCH REPORT

Designing for Fun: Can we design user interfaces to be more fun? (2004)

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Can we design user interfaces to be more fun?

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Designing for fun?

Fun-filled experiences are playful and liberating – they make you smile. They are a break from the ordinary and bring satisfying feelings of pleasure for body and mind.

Joyful sensations often come during physical activities such as entertainment, recreation, or sports - parties are fun, dancing is fun, skiing is fun. Fun is also tied to mental challenges such as solving problems, playing music, and discovering something new. In gentler forms it can also be about laughing at late-night comedy shows, listening to music performances, or watching movies. For me, fun is often social -- attending parties, trading stories, or meeting compelling personalities.

The psychologist Mihaly Csikszentmihalyi (1996) talks about the *flow* experience of optimal performance when people are creatively facing challenges to achieve personal goals. Csikszentmihalyi is talking about my kind of fun. When people are in the flow state they suspend their fears, put aside their anxieties, and engage fully in the experience of the moment. Concentration is intense, time vanishes, and people experience mastery. Sports commentators talk about being "in the zone"; archers talk about the target coming to the arrow.

All these examples could be called fun-in-doing. Another kind of fun is more tranquil and calm. It is about relaxing. It is not tied to action or goals, but to absence of action or goals. We all need some mixture of these two kinds of fun, but I'll focus on fun-in-doing rather than fun-in-not-doing.

These descriptions of fun-in-doing are meant to lay a foundation for readers to think about the ways in which technology can be designed to produce more fun for users. The topic of interface design for fun-in-doing goes back to early studies of games, such as the insight-filled work of Tom Malone on educational games (1982). He summarized the design heuristics for enjoyable interfaces with these criteria: challenge, curiosity, and fantasy (which he tied to emotion and metaphor). Malone described striving to attain goals, in a context of uncertainty. This led him to see the importance of multi-layered interfaces that would allow users to choose the level of challenge.

Contemporary work on interfaces for children continues to emphasize these themes, even as applications have broadened from games to intrinsically motivating experiences. It is fun to browse NASA's pages for kids about space exploration ("Games, activities, and a ton of fun for

NASA kids!") and it is fun to find books in the International Children's Digital Library ("Explore the fun – read 324 books online"). Children are strong in their declaration that they expect to have fun using technology. Children often link the idea of fun to challenges, social interaction, and control over their world (Hourcade et al., 2003; Druin and Inkpen, 2001).

The topic of fun-in-doing and emotional reactions for adult users of interfaces has become hot (Hassenzahl, Beu and Burmester, 2001). The interest stems from designers who are shifting their attention from desktop tools for serious professionals to new environments where discretionary users and non-professionals dominate. Lively topics include web-based services such as shopping or banking, mobile devices such as cameras or cell phones, and consumer electronics such as music players or home entertainment centers.

For these new and highly competitive markets, I believe designers must address three almost equally important goals that contribute to fun-in-doing: (1) provide the right functions so that users can accomplish their goals, (2) offer usability plus reliability to prevent frustration from undermining the fun and (3) engage users with fun-features.

How can we design interfaces to be more fun?

For the first goal, designers have only modest resources that discuss task-suitable functionality and processes to envision new user goals. While there are models of design spaces for input devices or menus, there are few higher level models of user goals that might guide designers to creating new services and applications. For example, what theory might guide designers to realize that digital cameras should come with cell phones so that users can send photos to friends and family members? What theory would suggest that peer-to-peer networking should be expanded to family photo sharing or corporate supply chain bidding?

Some insights come from promoters of the Contextual Inquiry method (Holtzblatt & Beyer) and activity theory, who recognize the importance of generative theories that might help designers invent enjoyable services and fun-filled applications. The Activities and Relationship Table (Shneiderman, 2002) tries to lay out the key human activities related to information technologies (collect, relate, create, donate) and a range of human relationships (working by yourself, families & friends, colleagues & neighbors, and citizens & markets). The relationships are organized by degree of shared knowledge, trust, and expectations of future encounters. The Activities and Relationship Table has proven to be useful to me, but has yet to be widely accepted.

For the second set of goals -- usability and reliability without frustration -- designers have a stronger set of guidelines, principles, and theories. There are lengthy sets of guidelines with hundreds of do's and don't (Williams, 2000), as well as short lists such as the Eight Golden Rules (revised for the 4th Edition of *Designing the User Interface*, Shneiderman & Plaisant, 2004):

1. *Strive for consistency.*
2. *Cater to universal usability.*
3. *Offer informative feedback.*

4. *Design dialogs to yield closure.*
5. *Prevent errors.*
6. *Permit easy reversal of actions.*
7. *Support internal locus of control.*
8. *Reduce short-term memory load.*

These rules are far from complete and sometimes in conflict, but they have served as a useful starting point for design critiques. Many other researchers have had fun building on these Eight Golden Rules and in criticizing them.

For the third goal, designers are now beginning to develop theories of user engagement through fun-features: alluring metaphors, compelling content, attractive graphics, appealing animations, and satisfying sounds. When the functionality and usability have been accommodated in the design, it is time to add the extra touches and flourishes that delight and amuse users. These can be an appealing splash of color, an engaging animation, or a pleasing sound. A shimmering rainbow, a zooming movement, or a crescendo of trumpets can bring a smile to many users' faces. Getting these right is difficult; too many designers go too far in using excessively bold colors, distracting animations, and annoying sounds.

Coming up with *alluring metaphors* is still an art for creative types, but we know that the desktop interface metaphor has been a success story for three decades. Other metaphors, such as shopping carts, painter's palettes, and notebooks have all helped make modern interfaces comprehensible and fun. Their direct manipulation style with drag-and-drop, click-to-select, or click-drag-release actions have become widely known and intuitive for users. When done well these techniques enable users to forget about the interface and concentrate on their tasks.

Compelling content such as first-rate writing, striking photos, and outstanding graphics are key elements in making interfaces more enjoyable to use. Of course, there are no automated metrics for writing quality (only readability), image impact, or graphic excellence. Quality has no metrics, but you know it when you see it. But satisfying every user is really tough, so success with some segment of the population is a reasonable goal.

Attractive graphics are important, but attempts to find predictive metrics of user preferences for esthetic qualities are risky. This goal is once again in fashion -- useful guidelines are beginning to emerge from projects where user preference data is available for large numbers of web pages (Ivory and Hearst, 2002). We know that alignment and grouping is important for rapid performance (Parush, Nadir, and Shtub, 1998) but do they also add to esthetic enjoyment? Balance and symmetry are classic notions for graphic design, but when do they also increase preference and improve performance (Ngo and Byrne, 2001)? Some color is helpful for highlighting and showing relationships, but when is the use of color seen as attractive?

Similarly *appealing animations* enrich the possibilities for designers, but the research results are mixed. Animations are helpful in providing informative feedback about user actions, but they are an annoyance when they distract users from their tasks. They are usually liked to explain processes, such as crystal growth or algorithm execution, even though evidence that animations improve learning is shallow. Smooth transitions and zooming are enjoyable and helpful,

preserving user comprehension, even though they slow users down. The direct manipulation principles of rapid, incremental, and reversible actions with immediate visibility of results, also increases satisfaction and performance. Animations that convey information such as the movement of files or progress in downloading are appreciated, but disruptive and distracting pop-up boxes and dancing icons are usually annoying.

Satisfying sounds are a vital addition for games, and helpful for alerting, such as a ringing phone. Sound design requires skill, but suitable sound effects give effective feedback and are well liked by users. However, users want control over the sound, especially the capacity to turn it off. The market in custom ring tones for cell phones is way beyond what can be justified by necessity – it must be fun to have your own ring tone.

Parting thoughts

User interfaces are taking their place in the world of fashion and style, which is great news. Just as dining out is more than getting a balanced diet and wearing clothes is more than staying warm, using interfaces is becoming a personal statement. It's great that designers are turning attention to fun, as a separate design space, distinct from functionality, usability, and reliability. Did anyone notice that *fun* is part of *fun*ctionality?

Designers who accommodate differences among users by providing adequate user controls will produce the most successful products. The controls will enable users to change color schemes, sound effects, and animation speed, or to dispense with these flourishes entirely. Productivity tool users have tasks to accomplish, so the fun aspects should not interfere with goal attainment.

Predictive models of fun-in-doing are an ambitious goal, but a useful step forward would be to develop prescriptive models of how to design more enjoyable graphical user interfaces for web pages, desktops, and mobile devices. Designers need guidelines for graphical style issues such as symmetry, elegance, simplicity, and distinctiveness. They need principles for creating images with high impact and rules for dealing with familiarity, authoritativeness, and branding (Mullet and Sano, 1995).

However, guidelines, models, and principles alone will never guarantee success. Designers have to develop their own style and then test, test, test, and test again. Excellence in design is a great facilitator of fun. Are you ready to have fun designing playful and liberating user interfaces?

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