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Thoughts from 35,000 feet: The evolving real-world context of User Centered Design

For years we have been hearing the mantras that drive home the theme of growth and proliferation of technology: “pervasive computing,” “embedded computing,” “ubiquitous computing,” the networking of the world, the global economy and the shift to an information economy. Of course, these broad trends have indeed been playing out. But growth does not just bring more and more of the same.

As any technology grows in pervasiveness, its character changes. As information technology links more and more of the world, its function, usage, and role in society are undergoing changes. These changes in the role of technology will in turn bring changes in the way people interact with it, which will need to be addressed by changes in the conceptual, logical and physical levels of interaction design.

Those who forecast trends, or at least those who do so usefully, are not reading the future in tea leaves. They are merely “early noticers,” who allow themselves to project into the future what they have already seen and ask themselves how what they have noticed could in principle affect the big picture. They are “eyes and ears” for the rest of us, who may be too preoccupied for this type of reflection.

However, anyone can potentially be an “early noticer.” All it takes is to change your vantage point. You will inevitably note things that had not caught your

attention before. If you are willing to assume that anything that surprises you might surprise others, or at least might not be on their radar screens yet, that if it’s interesting to you it may be interesting to them, and you’re willing to spread the news of what your vantage point has shown, presto change-o, you’re a pundit!

A change in vantage point can be achieved by a change in attitude, involving stepping back from one’s immediate or daily preoccupations to reflect on the broader landscape in space and time. However, to stimulate such changes in attitude, it sure helps if your work throws you into situations that force new perspectives on you, or that just surprise you. Over the past several years, I have had the privilege of being thrown into a wide range of situations as an observer of many kinds of users in North America, Europe and Asia interacting with many kinds of technology, or doing their regular tasks prior to the design and introduction of a new technology. I have therefore had more than the usual opportunity to be sur-

prised, either because I had an assumption blow up, or because I encountered an issue or a difference where it had never even occurred to me that there was even a potential dimension of difference to think about. And, with more than the usual amount of time spent in planes, there has been more than an ordinary chance to reflect on my surprises. So I hope it is perhaps not too presumptuous of me to use this column to share some of what I've noticed.

My key observations all have to do with ramifications of the growing pervasiveness of technology that seems to be affecting usage in ways to which we need to be more attuned, whether to plan to address them in the design process, or merely to keep our eyes open for their potential evolving impact on design. I can group them into four major categories: effects of growing internationalization of technology; effects of growing integration of technology; effects of changing demographics of technology usage; and changes in the definition and "ownership" of user interface (UI) design in organizations. This last category I will touch on only briefly—that is worth another column.

International observations

We are increasingly designing internationally, whether we think about it or not. Certainly anyone who designs a website is designing for an international audience. Unfortunately, not all designers adopt an international perspective. And not everyone is even aware of the need for such a perspective, arising from the many differences that can impact international users. The problem often springs from the mistaken assumption that "everyone is the same." When we are lucky, these faulty assumptions are discovered in time to change the design BEFORE release. When we aren't, users are saddled with software that doesn't work as well as it should for them in their locale. In some cases, this is just an annoyance. In others, it is enough to cause failure of the product, or at least "disappointing" sales or use.

In my work as a consultant, I have had a lot of chances to engage in many types of user

studies—ethnographic, lab, usability, market research—in the US, Europe, and Asia. As a result of these opportunities, I have had the chance to see how a wide range of international users react to software in often unpredictable—or at least unforeseen—ways I can count on being surprised at least once in every country in every study I do. It has become almost a rule that things that neither I nor my in-country colleagues would have predicted when planning an international study will inevitably turn out to be the norm or the pattern. And assumptions made in advance often turn out to be false. In Germany, we thought that "no one would do this..." But they all did. And conversely, we thought "everyone will do that..." Except they didn't. And then the pattern was totally reversed in France. So much for prediction! As a result of such experiences, I have learned to be increasingly sensitive to when, in planning studies, I or my colleagues may be making assumptions. Once identified as such, these assumptions can get turned into research questions.

Failing to recognize you are making questionable assumptions can leave you unprepared for the many contingencies that arise. Indeed, one of the big sources of learning in doing international studies is the unanticipated logistical problems that arise from faulty assumptions and that have to be solved. These are not just headaches, they are prime sources of information, if you look at them that way.

Benefits can come to all users from our being forced to take an international perspective on usability. One application I worked on internationally was "too slow" in one locale (surprisingly to all, this was not in the US). It simply would not work there without redesign, which meant changing the flow and the structure in both dramatic and subtle ways. However, fixing this design problem, which had not been a "show stopper" in US testing, turned out to greatly increase the satisfaction ratings in all countries. The step-by-step structure of the application, intended to guide users through a complex process, was expected to be an important usability advantage, but turned out to be an annoyance.

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However, only in one region was it enough of a problem to force a change. If we had not tested there, the application would have failed in one locale and been less-than-satisfactory worldwide. As it was, the application has received very good reviews.

Of course, the surest protection against instantiating faulty assumptions about users in designs is user testing, ideally international testing. In my experience, the it is still a particular problem for North American designers—especially those who may not have experienced non-US culture directly. It is very difficult to design or appreciate how culture-bound we are if we have not had the opportunity to experience a culture very different from our own (and preferably, to have been immersed in and culture-shocked by the differences!). And even if we have had an opportunity to experience it, culture-shock fades quickly. As multi-cultural as the US is becoming, it is still NOT “the world”—not by a long shot!

It is still the case that US-centric software is a mixed thing. On one hand, non-US users may see it as positive—new functionality, fun, or state-of-the-art. On the other hand, these same users’ perspectives on US-centric software can also be very negative. Some things are “style” issues—an Indian style (color, flow, shape, etc) is far more appealing in India than “American” style—and a firm knowledge of how to engage this appeal is vital to designing good “local look and feel.” Some of these things might be considered more fundamental to the interface usability—metaphor, navigation and structure. In addition, if the technology forces user to work in a way based on American practices, but which do not fit their work practices, software is most likely to be viewed negatively. This is a key mistake and one which we are often most at risk of making if we do not think of our international users or if we do not understand the differences in work flow and task structure in different national contexts.

Another example of some international differences that can affect global design has to do with basic differences in how computers are used around the world. For instance, when

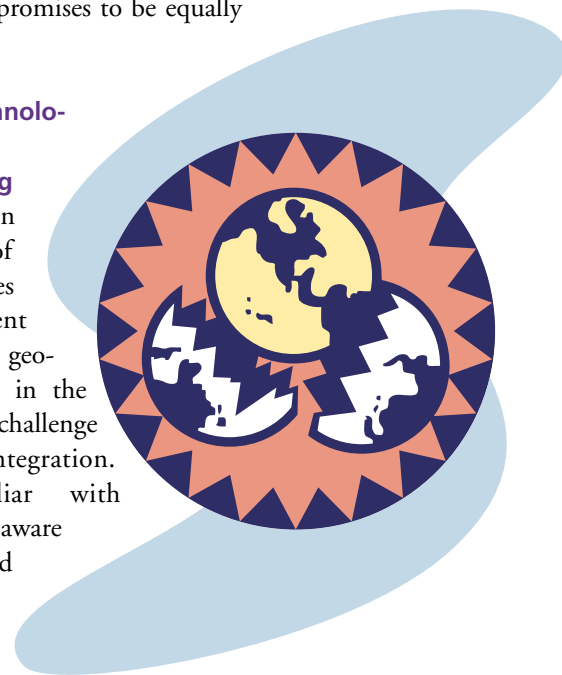
designing for Asia, designers need to be aware that in many parts of Asia, people use laptops, rather than desktops, to save space. Therefore, the display characteristics, input devices, etc. may be very different from desktop users in the US. The overall technology context differs across regions in ways that affect usage. For example, older (i.e., slower) technology and differences in telecommunications rate structures can significantly influence the willingness of users to “sit still” for downloads—especially of high quality graphics which “hog” time and space, but don’t necessarily add much in the user’s eyes.

Global UI design is a skill that calls for knowledge and links around the world.

For those of you who are interested, you can learn far more at an upcoming conference—the Second International Workshop in Internationalization of Products and Systems (IWIPS2000), which will be taking place in Baltimore, July 13 -15 Contact Donald Day, who is the chair (d.day@acm.org) for more details. The first workshop was extraordinary and the second promises to be equally great.

Impacts of technology integration and networking

The proliferation of technology of different types and in different regions leads to geometric increases in the importance and challenge of network integration. Anyone familiar with Scandinavia is aware of the profound changes coming in cell phones as they are merged with personal digital assistants (PDAs) and become web-capable. The UI implications are vast, and not limited solely to memory or size, but also to functionality and use. “Ubiquitous computing?” To be sure!



However, given the continuing differences in telecommunications systems, the dream of “one number, accessible on one cell phone worldwide” is still elusive, although we are told it is certainly coming. The global economy will increasingly force us to deal with the user interface issues of global interconnectivity. And this extends to more mundane technology, like email as well.

As a globe-trotter dependent on email, I can't begin to count the number of hours and trial-and-error attempts to “connect.” Last year alone, I logged on from England, Scotland, Germany, France, Netherlands, Spain, Singapore, Hong Kong, and, not to mention many U.S. cities. But even with every phone and power adaptor in the world in my kitbag, and even with significant knowledge of the hardware, software, and telecommunications characteristics of both my equipment and the hotel/office, I still had to “tweak” protocols and settings many times to be successful. It is a frustrating

process—and I am in the business of making UI “easy to use for normal people!” This is an area where there is certainly tremendous room for improvement, and a great opportunity for UI people to work creatively!

Demographic changes

As a parent, as a consultant and as a researcher, I have noticed changes in the users of technology that are at least partly a function of age and generation. In doing in-home studies, I have noticed many changes in the past few years in the ways that kids—particularly teens—interact with technology. These kids are “plugged in”—comfortably on-line, carrying on multiple chat sessions as well as listening to music, doing homework assignments in one application AND playing solitaire, all while also talking on the phone. Their multi-channel, multi-processing seems like chaos to me. But to my daughter, to

young people I have observed using technology in numerous in-home ethnographic studies, and to many younger colleagues on my clients' project teams who work this way daily, this is just normal life. If they can only have just one “channel,” many of those reared on information technology say they can't concentrate.

Depending on the purpose of an application or product interface, this may translate into a very different “ideal look and feel” for the UI for use by a multi-processing person. Things that used to be “no-no's” in UI

design, like movement in multiple parts of a screen, now scream from practically every website. Is this because of poor design? Or because younger users find this attractive and actually enhancing? Are these aesthetic preferences interfering with functional usability? I can't say definitively, although I can say that usability evaluations with younger users are often different than those with older users. What makes some-

thing “usable” for a “mono-processor” and a “multi-processor” have definitely been different for the sites for which I have done usability evaluations recently. For the former, often “older” users, multiple movements are very disconcerting and significantly delayed task completion, whereas, with the latter, “younger” users, accustomed to this new way of processing information, there were no apparent task implications. We will need to think about what this means to us as we design future web-based applications.

This raises the larger question of to what extent good UI design is governed by fundamental human information processing principles that can be derived from theory or from basic research, versus how much it will always depend on the shifting user habits, skills, and expectations that are driven by adaptation to evolving technology and can only be discovered through constant empirical testing in the



field. Certainly, we can conceptualize two levels of cognitive phenomena, one level “hard wired,” and the other learned or culturally dependent. My bias is that we will often be surprised by how much of what we thought of as basic actually belongs in the learned or culturally dependent category, as continuing proliferation of and exposure to technology changes human information processing patterns.

Another demographic change I have noted is that computer technology is no longer an “elite” domain. It has spread, at least in the US, into as many as half the homes in the country, or more, depending on who you read. One sign of the deeper penetration of technology into a broader range of income levels is that it has become much easier to recruit people from lower SES levels for studies. Also, in the past several years of doing studies in homes in homes including those where the average income is relatively low by national norms, that more and more frequently there is a PC that all the kids use for homework, games and Internet access. “Our PC may not be new and quick,” said one mother, “but it is our link to the outside and to a better life for my kids.” Other families have purchased old technology cheaply and then found free Internet providers to allow access to the technology.

Along with the general, increasing spread of computer technology, there seems to be an increase in the number of girls and women who are using technology. It is increasingly easy to recruit girls and women for user studies, for instance, and it is no longer unusual for a young girl to be the “local expert” for a family, something that was virtually unheard of in the studies I did in homes even 5 years ago. Sadly, it is my impression that young women and girls still tend to underestimate their expertise and experience with technology, whereas young men still tend to over-estimate their expertise. For instance, take the young woman, of 14, who after saying that she was “like really dumb with technology and stuff,” proceeded to show me a very sleek and sophisticated website she had designed for her Girl Scout troop and a game

that she had designed for her younger brother. She also was the troubleshooter for the family computer (which crashed while her mom was using it) and then downloaded and installed a new printer driver—all in the course of an evening visit. She was hardly “dumb with technology.” A 14-yr old boy in the very next home we visited boasted he was a “geek and a wizard” with computers, but was unable to troubleshoot a very simple setting issue, even though he said, “this is so frustrating because it happens every time I try to do this.” Of course, whether this is a statistically reliable finding, I can’t say, but, based on my personal observations, such discrepancies between male and female self assessments and the skills I see them demonstrate when they sit down to use the technology are not uncommon.

Business/organizational developments

It is, perhaps, a predictable consequence of the “growth and proliferation of technology,” that more and more organizations are actually taking usability and user interface design seriously. With this, there arises a significant of ownership and placement within organizations, and the issue of the relationship with marketing.

More and more, I am seeing marketing organizations “claim” usability and even UI design. Should we care? I think we should. This is not merely a matter of politics, and defending the guild of UI and usability. It is a matter of retaining the distinction and complementarity between what is contributed by typical market research and behavioral user-centered design research.

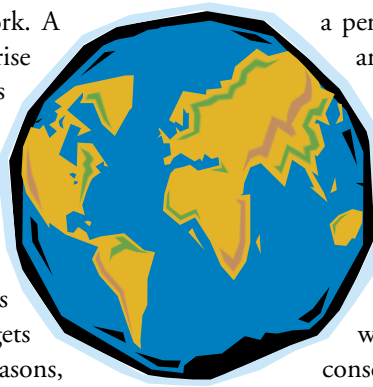
In many organizations marketing is that unit which is delegated the task of keeping its finger on the pulse of the customer, and representing the voice of the customer within the organization. Marketing also tends to be more strategically placed in organizations than the development and design function. So, naturally, marketing may pick up the ball on usability. This offers a potentially powerful linkage with the UI profession and a potentially powerful organizational ally for user-centered design. The challenge comes from

the contrast between traditional market research and the type of research involved in user-centered design. Marketing research has typically been based on self-report, opinion, and preference data. While its primary focus has been on supporting sales strategy by identifying “the compelling reason to buy,” it has also contributed to design. However, its input into the design process is different from that of the user-centered UI design professional. It has more to do with identifying new product opportunities, and desirable features and functions, rather than on how the user interaction will actually work. A second challenge that can arise where marketing becomes the internal champion of the usability theme is that marketing’s “strategic” placement in organizations has commonly isolated it from the hands-on process of design, where usability gets built in. For both of these reasons, as marketing increasingly picks up on the theme of usability, the UI profession has a responsibility to preserve and promote the emphasis on behavioral research embedded in the design process, and to help marketing professionals learn the necessary skills if usability is to become part of their mission. As more of our work is being solicited by marketing orga-

nizations, we are seeing some encouraging signs, in the form of examples of marketing working in closer partnership with designers, and recognizing the value of the behavioral research approach.

Conclusions

As you begin to be an “early noticer,” you will find that you start to see things you never knew were there, and this is the real value of taking such a stance. It is also, in a very real sense, the essence of our profession. It is our role, our goal, to understand things from a perspective different from our own and to help others to understand and value that different perspective. This is true whatever area we claim as our work—whether we are doing user-centered design, usability evaluation, exploratory studies, computer-supported cooperative work, or whatever. Adopting a conscious goal of being an “early noticer” can help you in achieving the paradigm-shift in your own perceptions, as you learn to notice and question your own assumptions more quickly, and to be truly open to the world around you. I hope you will find as I have that this stance has positive benefits in many areas of life. But, that is a different column. ☺



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