Design Sketch: The Context of Mobile Interaction

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ABSTRACT
Designers of mobile applications have long understood that mobile devices are operated within a context of significant constraints and environmental distractions. Despite this knowledge, however, many mobile applications are designed as if they were merely shrunken desktop or Web applications.

To encourage consideration of the specifics of context for mobile interactions and to highlight new user-meaningful opportunities latent in always-on, always-carried devices, this article describes a context model for mobile interaction and a set of design heuristics for successful mobile interactions.

Categories and Subject Descriptors
H52 User Interfaces *user-centered design.*

General Terms
Management, Documentation, Performance, Design, Economics, Experimentation, Human Factors.

Keywords
Mobile, design, context, customers, interaction.

1. BACKGROUND
For mobile computing, context is everything.

Freed from the relative homogeneity of the desk-bound personal computer, mobile interactions are deeply situated in customers' everyday lives. In order to design for successful mobile interactions, we must understand the overlapping spheres of context in which they take place. To that end, we have constructed a context model for mobile interaction design (See Figure 1).

Mobile devices accompany their users throughout much if not all of the day. Unlike stationary work or home computers, or even laptops that are taken to specific places such as meetings and airports, mobile phones are with us in all the indoor and outdoor environments we travel. Device usage is shaped by existing cultural norms and by the many activities we are engaged in simultaneously. Usage goals fluctuate as vastly as attention levels, and the number of mobile device tasks continues to grow.

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The device, too, is situated in layers of context, including carrier policies, connection types and all the handset variables from specs to familiarity. The interface is the space where these overlapping customer and device spheres intersect.

What are the implications of this model of context for mobile design? We must focus our design practices around mobile people, not mobile devices. In other words, we are not merely shrinking in size a Web experience, but creating an entirely new platform for communication and interaction. There is both opportunity to engage with customers at any place and at any time, and also the need to integrate new experiences with other real and virtual experiences that constitute daily activities and contexts.

2. HEURISTIC GUIDE FOR MOBILE DESIGN
Drawing from human computer interaction theory and practice, we propose the following heuristics for successful mobile interactions:

1. **All mobile interactions are user-driven.** High relevance is essential because of the highly personal nature of mobile devices. Content and activities must be desired *and* requested. Compared with email, there will be an even lower user tolerance for "spam." What has been most successful so far is entertainment content (video clips, ring tones, wallpapers, games) and communication with closest friends. On the horizon is a new focus on non-verbal communication, with devices that vibrate, change temperature or display lights and other ambient indicators of virtual presence that do not interrupt other activities.
2. **New mobile experiences compete with legacy user models.** As mobile services expand, design must take into account customers' reliance on user models that come from prior technologies. Just as we still use the word "dial" to refer to using phones that no longer have rotary dials, experiences using personal computers and landline telephones will shape initial adoption.
3. **Ease of use is paramount.** On the Web, ease of use can be accomplished by limiting choice and guiding navigation. On the mobile phone, affordances must be made for distractions, background noise and interruptions. Many usage contexts require single hand operation, and constraints of the ten key pad require minimizing user input (e.g., short codes, QR codes).
4. **Calm technology will be valued over constant disruptions.** With the mobile device in closer proximity to users for more parts of the day than the personal

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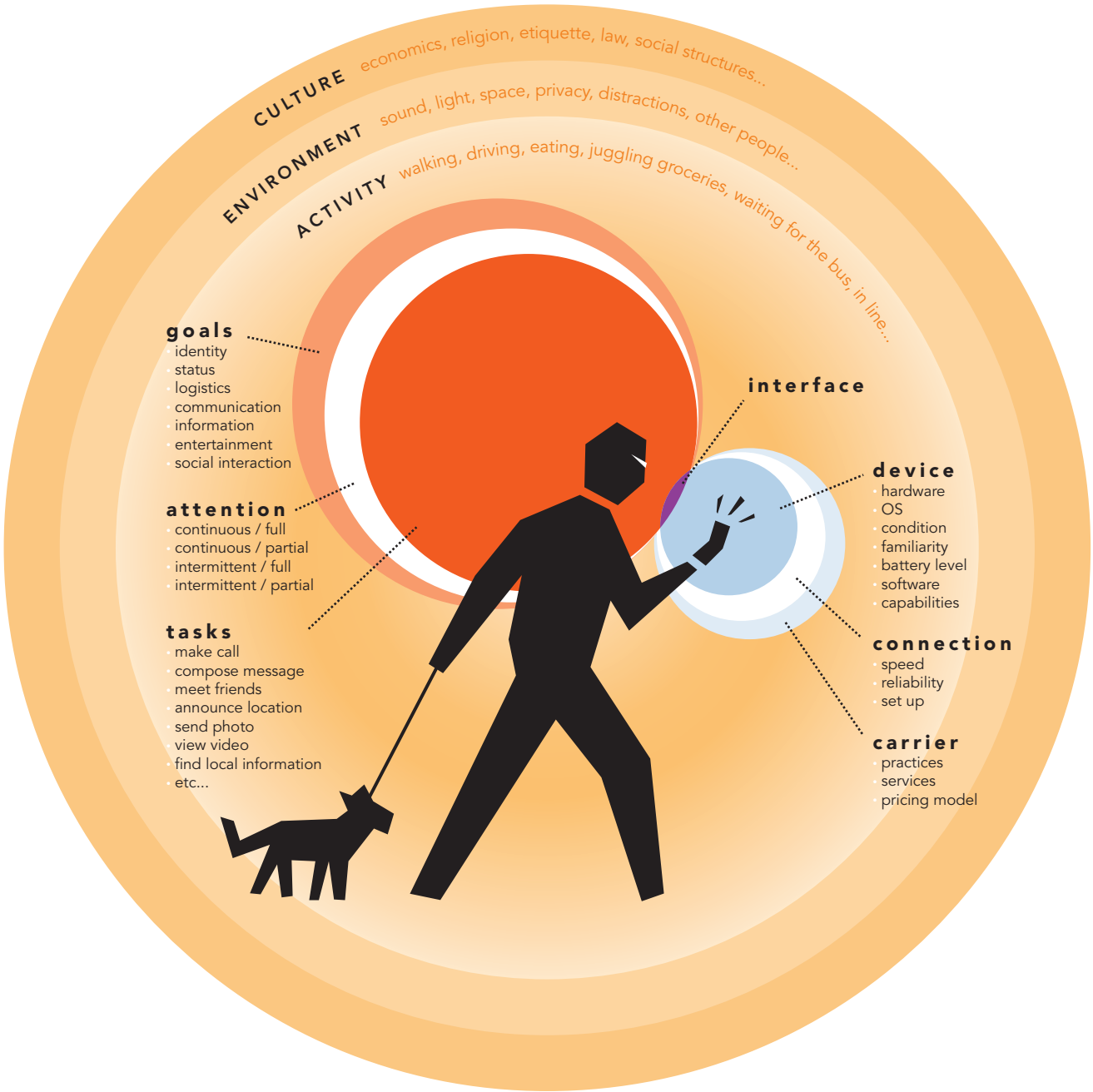
In order to design for successful mobile interactions, we must understand the overlapping spheres of context in which they take place. To that end, we have constructed a model of context for mobile interaction.



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computer, the device competes with many other demands on the owner's attention. A device that knows when to interrupt and when to occupy peripheral attention will be preferred.

5. **The device as continuous companion opens the realm for mobile experiences of different intensities and durations.** With the device always present, there is opportunity for multiple interactions within a day or week. In addition to engagement over time, games and fast tasks can fit within users' everyday activities. Asynchronic communication, including the popularity of text messaging, points to new interaction models that do not interrupt other activities.
6. **Mobile interactions can extend beyond the device.** Users may prefer to enter information on the Web from a personal computer, and see results displayed on the mobile (as is currently possible with the integration of Google maps on the mobile). With further integration of voice and text services, we may request services by voice and receive them as SMS on the phone. The mobile phone can also respond to environmental sensors and networked services.
7. **Mobile interactions are often small steps in part of larger user goals.** Many interactions must be intuitive and rapid. For example, if we are searching for an address when late for an appointment, we will have a low threshold for learning, registering or other obstacles to retrieving the data and locating our destination.
8. **Peer-to-peer is the most trusted form of mobile marketing.** Mobile phone users are more likely to respond to messages sent or forwarded by friends. Viral marketing and sponsored platforms foreground desired content and trust. Mobile social networks can guide decision-making in many locations and contexts, creating new "mixed realities" blending virtual and in-person realms.
9. **With GPS on the near horizon, the mobile phone will be able to provide services that redefine our social networks and the places we inhabit.** Already small carriers are introducing services to locate friends on a map, and it's not hard to imagine a combination local directory and navigation on the phone. As new Web services like Platial.com demonstrate, we will soon be able to annotate and discover other peoples' virtual comments about the physical world we live in. This is the digital equivalent of carving your name in a tree, and it is likely to have unexpected consequences for retail and public spaces.
10. **Mobile phones will not be limited to the processing capabilities of the device.** As a single node in a networked system of abundant computing, the mobile phone can serve as a "dumb terminal" to massive computing services delivered over the network. The mobile phone can become a remote control for smart environments, and serve functions including personal identity, wallet, ticket, entrance key, activator and personal display.

3. CONCLUSION

Mobile design is a very new field that is changing rapidly and unexpectedly. Our model points out some of the constraints arising from the context of use. Human constraints include simultaneous activities, single hand use, information overload and competing user goals. Device constraints include text input, small screens, slow connections, and short battery life.

Our model also highlights many opportunities for new forms of communication and computing that integrate into customers' lives rather than interrupting activities. Mobile applications have only just begun to gain new customers by providing entertainment, connecting people, managing schedules, arriving at meetings and leisure activities, and making their lives easier.

By engaging in customers' situated contexts, mobile applications and mobile marketing can surpass traditional models by truly supporting customers throughout their day and serving as a trusted companion in capacities that are still being imagined.

4. FURTHER READING

[1] Greenfield, Adam. 2006. Everyware: The Dawning of Ubiquitous Computing. New Riders Publishing.

[2] Johnson, Steven. 1997. Interface Culture: How New Technology Transforms the Way We Create and Communicate. Harper San Francisco.

[3] Weiser, Mark and John Seely Brown, 1995. Designing Calm Technology. Xerox PARC December 21, 1995 http://sandbox.xerox.com/hypertext/weiser/calmtech/calmtech.htm

[4] Suri, Jane Fulton. 2005. Thoughtless Acts: Observations on Intuitive Design. Chronicle Books.