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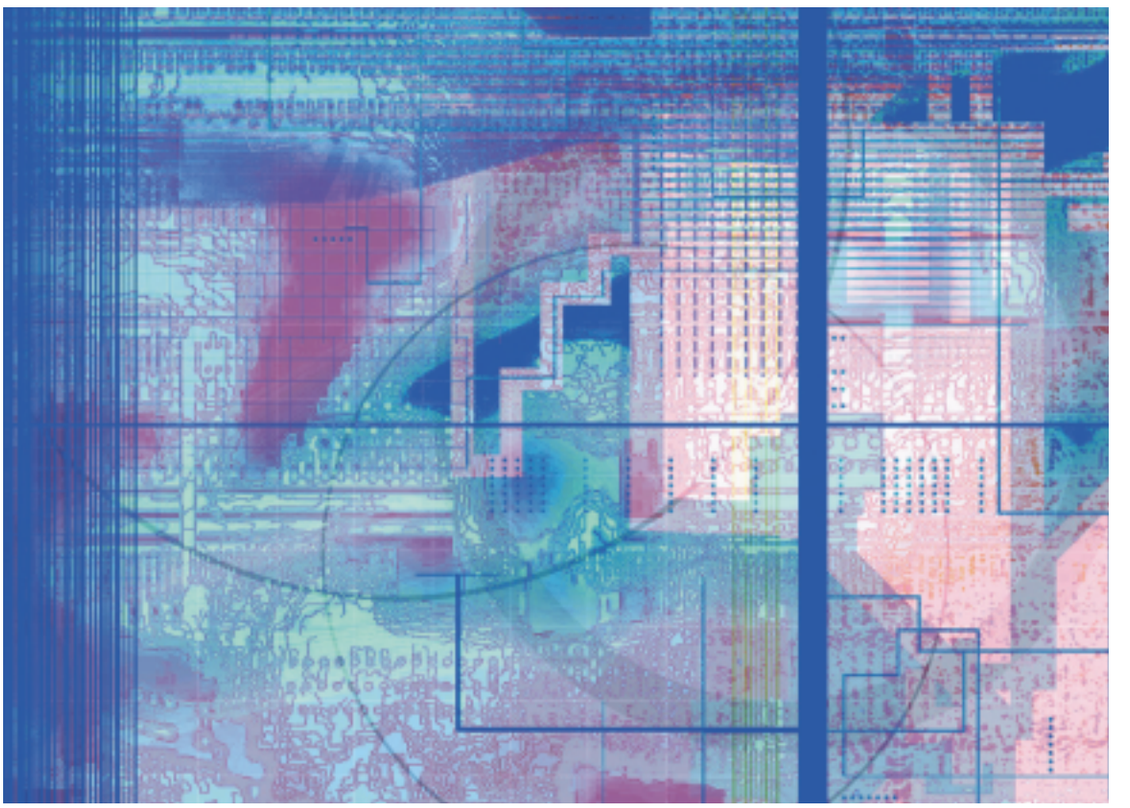

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The Culture of Interaction: About Foreign and Not-So-Foreign Languages

The growth of the Internet, along with advanced interaction technologies such as speech recognition, wireless computing, and intelligent agents, is increasingly driving the strategies of computer and software corporations. Paradigm shifts in these developments significantly affect how design consultancies think about and carry out design. Designers face constant pressure to adapt to the changing types and needs of clients.

These trends have brought about a change in focus for our interaction design group at GVO, Inc., a design firm. We moved away from designing for a single-user, desktop computer and toward designing for interacting user communities on the Internet. In this article we will present the strategies and tools that we discovered during that process and illustrate them with a case study from our practice at GVO, Inc.

Finding Culture in Interactions

Until recently, typical tasks of interface designers at our design firm were shaped by the demands of designing desktop applications. The goal was to create visual simulations of tools on screen that allow the user to interact with the functions of the software. That work required creating visual representations and evaluating them with users.

Today our clients give us a different type of design assignment. We no longer have individual users, but rather a user community. Instead of a single application, we offer a range of services that are deployed to that community over a network. Our task is to provide users with appropriate means to browse and query those services with a range of devices such as personal computers, personal digital assistants, telephones, or television. Consequently, the interactions we work with today are driven by community members asking questions and getting answers. In other words, we now design conversations instead of on-screen representations of tools.

These conversations might include how to address a user, how to introduce her to a service, or how to give appropriate answers to her questions. How people converse depends highly on how they interact in their real-world cultures. Hence, a successful interaction design must be consistent with the specific culture of the user. Only when this is assured can we then focus on the visual look and feel of the query box in which those interactions take place, that is, the culture of interaction of our clients' customer groups. The kind of cultures our clients bring us varies with every client who walks in the door—from national cultures, such as Chinese, to subcultures, such as medical doctors, teenagers, or San Francisco Giants fans. As a result, visual design, which used to be the core competence required to serve our clients, is gradually being replaced by the need for expertise in understanding language, culture, and conversation protocols. A focus on culture has become central to our work and service offering.

Bringing culture—the shared beliefs, values, etiquette, and language of a group—into our design practice presented us with important questions:

- What tools and approaches can uncover and analyze the culture of interaction of a specific customer community?
- How can we model and describe cultural rules of interaction?
- How can we translate real-world interaction rules into interactions with software and Internet applications?

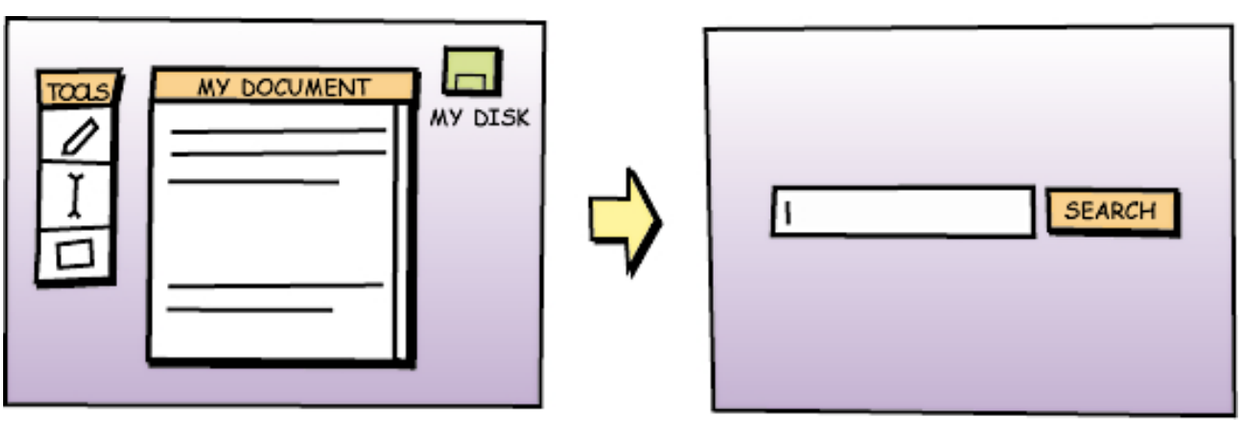

Figure 1. The user interface paradigm shift of the Internet: from designing simulated tools toward asking questions and getting answers.

The effort to address these questions has transformed the structure of our teams, our collaboration, and our methods. Anthropology has proved to be an extremely valuable resource, providing methods and concepts for understanding and modeling user cultures. However, the anthropological methods used in academia or large research and development studies were insufficient for our small design firm, which requires speed and flexibility. Close collaboration between anthropologists and designers on real-world projects has played a pivotal role in adapting and integrating such methods with more rapid and generative techniques. In this context the analysis of user language emerged as a technique with great potential. Language is more than just a functional means of communication within a culture. Human language reflects how individuals think and interact with each other—and how they will approach interactive products introduced to their culture. Semiotics, the science of signs, provides powerful tools for understanding a language in its context of use. A technique derived from semiotics delivered promising results in our design projects. We called it rapid semiotic modeling.

Tools and Techniques to Uncover Cultures of Interaction

The language of a customer group reflects its members' view of the world. The shared rules about interacting with others are embedded in the language of a group. This is true for actual languages (for example, Chinese or English) as well as for "languages within a language" (professional domains, subcultures, social groups). Like languages, user interfaces consist of rules and elements. Any successful software or Internet product must follow the protocols of a group's interaction—that is, speak the local language—to communicate effectively with users. Usability issues, inefficient use, or misunderstanding of a product's benefits often indicate disconnection between the language of the user and that of the interface.

Rapid semiotic modeling focuses on communication between the user and the interface. It makes explicit the language that is used—or has been attempted to be used—by both parties in the interaction. It uncovers the language that users understand. A user interface can then be created to reflect the language of the user, making it more understandable, intuitive, and, ultimately, easier to use. If a client already has a user interface in place it can be used to reveal the roots of usability symptoms and redesign the interface to come closer to the users culture of interaction. In practice, the three steps of rapid semiotic modeling look like this (see Figure 2, on next page):

1. *Collect*
   User language is collected. Users are encouraged to talk about their work, life, and goals. Although this collection of information may also include problems with existing products, the scope is not defined by an existing system or its application.
2. *Model and Compare*
   The rules and elements of users' language are analyzed. A semiotic model is created to guide the design. If an earlier product interface already exists, a semiotic model for it can be created as well. The two models can then be compared to identify similarities and differences. The discrepancies between the two models provide clues about the roots of usability issues.
3. *Create*
   A design is created that reflects users' language. The rules are reflected in interface design, navigation, dialogue structures, and so on.

Making Interaction Fit a User Culture

In this section we discuss an application of rapid semiotic modeling, based on a commercial design project performed by GVO for an industrial client. This case study is detailed in a chapter by Heiko Sacher in a book on the use of ethnography in product design [1]. Our challenge was to redesign a browser-based user interface for a database. The database has more than 4 million items and is accessed by scientists who perform experimental lab work. The existing user interface for this application followed standards of Web design. Scientists

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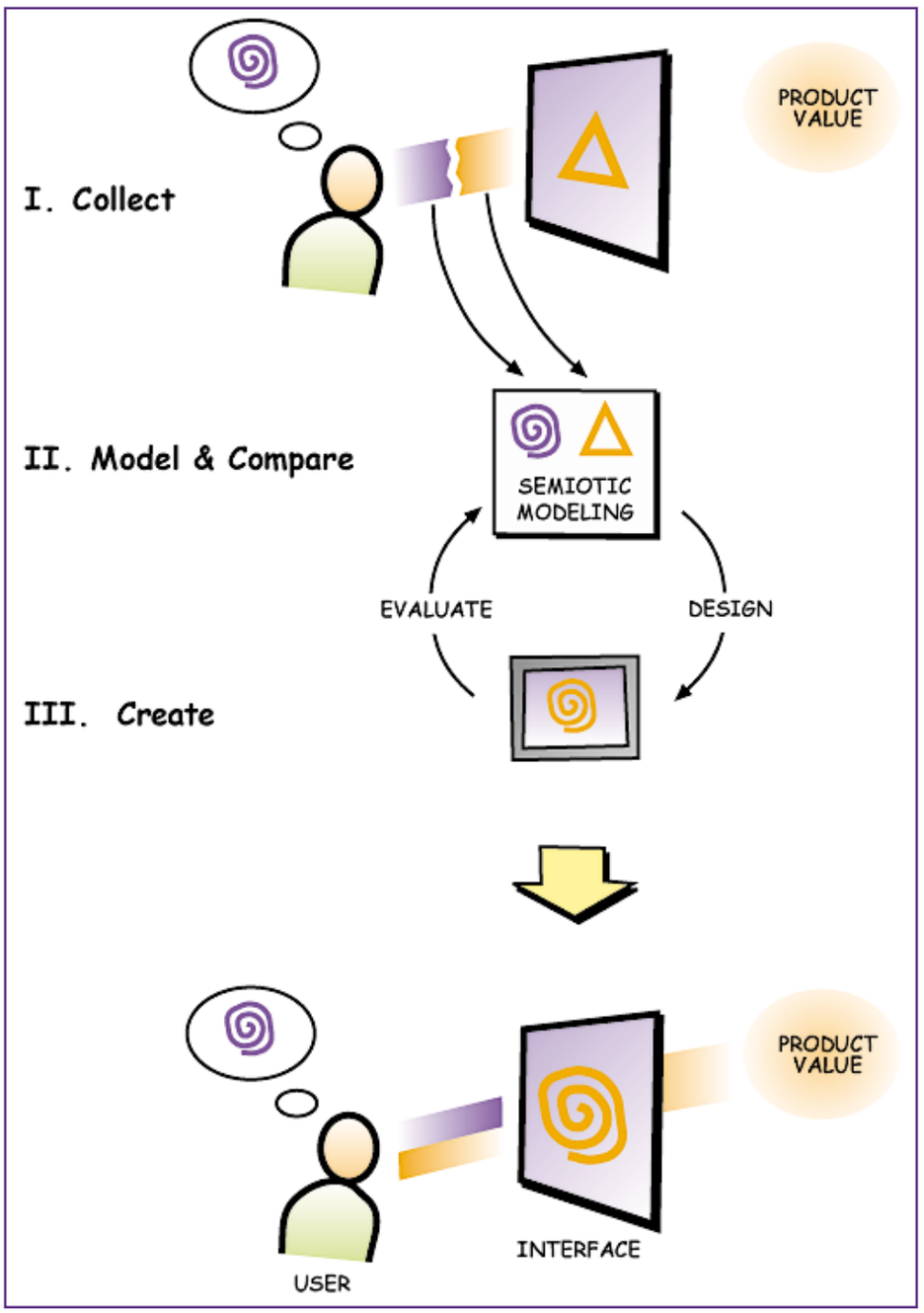

Figure 2. Rapid semiotic modeling of a user interface.

queried the database, and the results were structured by hyperlinked pages that users could jump to. Despite their familiarity with the Web, most scientists did not feel comfortable with this interface. They avoided using large parts of the system that could have provided significant utility. The scientists had difficulty understanding how the system could support their work. Nevertheless, all the scientists thought the underlying data in the database could benefit them.

When we started this project, significant usability problems clearly existed. However, users' self-reports were not very helpful or diagnostic. Feedback collected from users on the interface was limited to broad expressions of inappropriateness, such as "it doesn't seem efficient," "it is clumsy," and "I don't like it; don't ask me why." Furthermore, it quickly became obvious that our straightforward, "conventional" design approach would not work. We could not find a solution by iterating a representation of a tool on screen or narrowing the scientists' work to a limited set of task scenarios, because the scientists' uses of the database were so varied and individualistic. Interviews and observations showed that although the scientists shared a set of simple, generic tools and processes, how they would apply them to their to research work was strongly driven by diverse, individual strategies. They believed that their personal strategies were pivotal for successful findings and even for individual careers. In fact, in discussions, they consistently rejected a task-driven approach to the design of their tools. An interface that implied a particular, structured way to use it in order to successfully complete a defined task was considered inappropriate. Therefore, the constructs underlying the usual approach—understanding the task and then tailoring a tool representation for it—did not seem applicable.

We concluded that the solution could lie only in understanding the culture of interaction underlying the work of those scientists. We collected the language used throughout their experimental discovery process in the lab, with books, and on the computer. The rapid semiotic modeling approach enabled us to reveal a consistent set of rules and elements in the scientists' language. Implicit in their descriptions of their database use, lab work, and the larger context of their research projects was a recurring theme: "I (the scientist) go out there, gather things, and bring them back. I look at the things, keep the good, and dump the others. Then I go out again."

Some examples include the following:

*"I **go to** database X and I **go to** database Z and I read about it **there**."*

*"I wanna know what's **out there**, what others have done."*

*"I **take** the hits from the search ... **pick** a few... **go back** and **look** at those analysis results... then from **there** I might **take** those and search again ...then I'll **get** the items themselves and **take** that..."*

*"I **get** the information and then try to **store** this information and then I **go back**."*

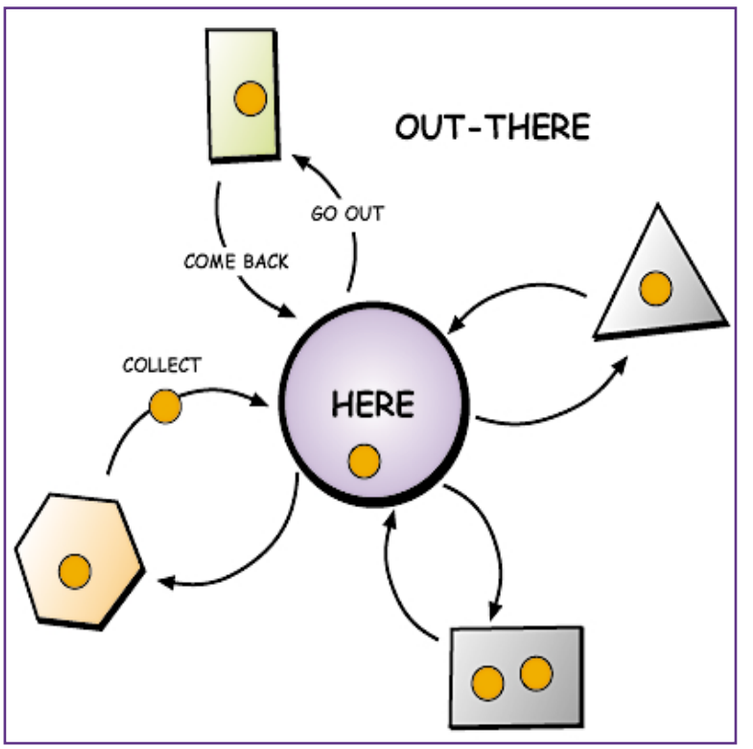

Figure 3. Hunting and Gathering, a semiotic model inherent in scientists' language.

home	move around	out there	hunt	gather	investigate
my	leave	places	troll	get	put together
we	go back	outside	go through	take	collate
us	back home	over at	shop around	pull out	play around
ours	go there	external	look around	capture	prioritize
internal	come here	somewhere	see	pick	decide
inside		theirs	find	select	analyze
within		somebody's	discover	a snapshot	understand
		beyond	a close look		eliminate
		unsecured	find details		dump
		gray area	right place		compare

Figure 4. Components of (top row) and expressions used in (column items) scientists' mental model.

For easier communication both internally and with our client, and because of obvious analogies, the design team named the scientists' mental model "Hunting and Gathering." The team also created a visual map for this semiotic model (see Figure 3).

The language elements observed in the semiotic analysis followed consistent core themes: distinct places, concentric navigation, spatial logic ("here" versus "out there"), and collection of items. Although the individual scientists used different terms, they described the same underlying rules and elements (see Figure 4).

According to this hypothesis, our team suspected that this model is characteristic of and possibly distinctive of the scientists' culture. We partly validated this by collecting language from users of the software who work in the same cultural context but have a different role and background (i.e., software development). The members of this group did not perform lab work; they focused on customized or advanced database searches. We found that their language had a significantly different model, even when they described exactly the

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same activities as the scientists. Their theme was "I modify data. I receive a report and review it." The semiotic model underlying their language did not feature the notion of distinct spaces, gathering, or active navigation.

We then conducted a semiotic analysis of the existing user interface. Not surprisingly, it revealed a structure rooted in the hypertext, or World Wide Web paradigm. This interface paradigm had been adopted implicitly with the World Wide Web technology. The structure resembles an ambiguous constellation of places linked by paths. Users can jump from place to place without explicit beginning or end. Consequently, we called this semiotic model "Dungeons and Dragons" (see Figure 5).

The discrepancies between the Hunting and Gathering and Dungeons and Dragons models seem to capture some of the potential sources of the usability issues and the scientists' general discomfort in using this product (see Figure 6).

In other contexts, such as Web surfing or catalog browsing, the Dungeons and Dragons model might be very appealing. However, for the scientists this model clearly clashes with their mental model of doing research work. Scientists' language reveals their dissatisfaction with the dungeons because of their inability to "hunt and gather" with the existing user interface.

> *"You can go deeper in one question and if you have another question you're thrown off. You have to walk all the way back, that's a real problem..."*
>
> *"...there's no way to get to it directly, you have to do all this indirect...you have to go into a URL... and then have it come back and go backwards."*
>
> *"...there is no way to get to it directly. You have to follow a few paths."*
>
> *"... want to go to the next search and try to save the findings before I must go down."*

Our team's comparison of both semiotic models led to a deep and shared understanding about the causes of usability and acceptance issues that we had observed at the very beginning of the project. We then embodied the rules and elements of the scientists' Hunting and Gathering mental model in a simple interface prototype. We applied the semantics of Hunting and Gathering to the navigational structure, interaction design, and visual representations on screen. The prototypes allowed our team to validate that scientists recognized their model in the new

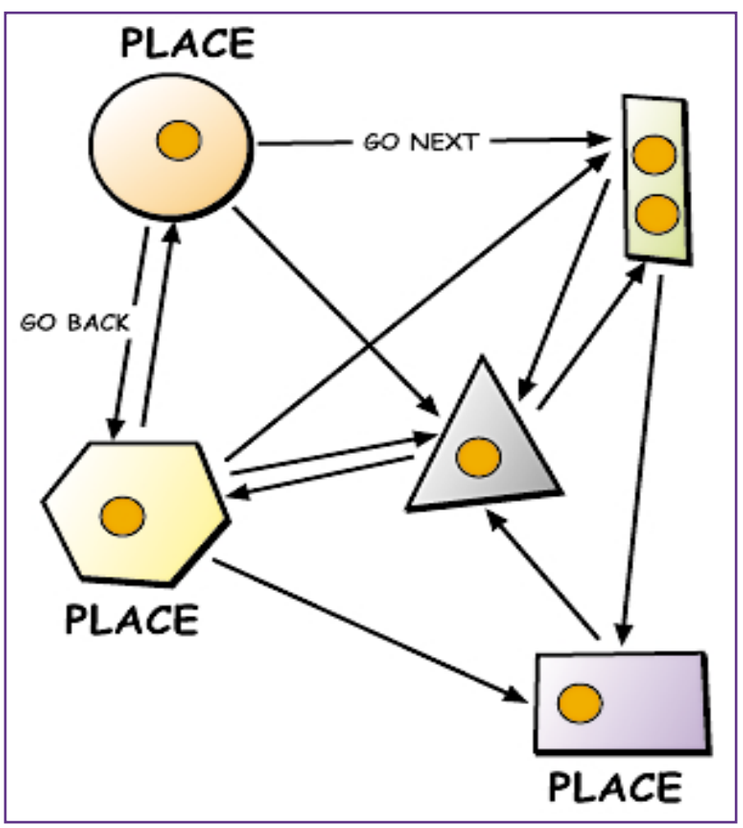

Figure 5. Dungeons and Dragons, a semiotic model of the user interface with usability issues.

Hunting and Gathering	Dungeons and Dragons
Concentric navigation	Maze
Here versus out there	Arbitrary places
Choices where to go	Given paths
Gathering	Things stay in place
Collecting things	One thing per place

Figure 6. Comparison of the two semiotic models reveals the discrepancies and roots of usability and acceptance issues.

user interface. The redesigned product incorporated the culture of interaction of the scientist. As a result, the scientists perceived the design as being more intuitive and easier to use. They displayed more willingness to use the database for their research work. Ultimately the scientists' willingness led to the increased likelihood that they will effectively use this database to facilitate significant discoveries—a crucial metric of success for both our client and their customers.

Observations Along the Way

Although integrating culture with our design led to promising results, it also involved challenges for our work style—especially aspects of collaboration.

Traditionally at our firm, social scientists conducted discovery, as well as evaluative research. Designers generated and refined concepts and products accordingly. Producers or project managers coordinated these linked but independent tasks. Our focus—on infusing the design with insights from user culture—demands much closer collaboration in the team. The designer is drawn into the research and synthesis of the cultural models, while the social scientist participates in translating those models into design concepts. Because of team members' diverse backgrounds and work styles this kind of collaboration requires learning and adaptation on both sides to establish a common ground for those disciplines.

Collaboration with clients has also changed. In the days of desktop applications, practically all of our clients were hardware or software companies. Their needs, organizations, and preferred modes of collaboration with a firm such as ours were fairly consistent. The Internet has enabled (or, in some cases, forced) traditional brick-and-mortar retailers and countless new "dot coms" to offer products, services, or information in new ways. The core competence of such companies is not software or hardware, but rather lies in a specific domain. Organization, work, and communication cultures vary significantly across such domains as medical, retail, law, or publishing. Understanding not only the culture of the users but also that of our clients during a project becomes a key strategy. Working with such diverse client cultures requires our team to educate itself and adapt to new client cultures with every project.

One positive aspect perceived by our clients is that the understanding of the user cultures leads to insights that go beyond an individual product. Models of their customers' culture of interaction can be applied across products and in some cases even to strategic business initiatives. This versatility can make our input more valuable but also more challenging for clients. Also, senior management at the client organization becomes more involved, requiring new types of project management tasks. A client manager who communicates to the client our process and its implications to their core business has evolved into a critical role.

A Promising Opportunity

Through discussions with other practitioners we learned that focusing on culture and using such tools as rapid semiotic modeling are not common at interaction design firms. Such methods, which are more often seen in academic or corporate research, are reputedly too slow and expensive and not suitable for small firms. However, our experience with this approach in commercial design projects was quite promising. It allowed us to solve problems of emerging interaction paradigms that proved to be hard to tackle with our existing methods. Rapid semiotic modeling offers a promising outlook for consulting firms that find themselves competing in the Internet market.

Reference

1. Squires and Byrne, eds. *Creating Breakthrough Ideas Using Ethnographic Research in the Product Development Industry*, Greenwood Publishing, Westport, CT, 1999.