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# Faster, cheaper, deeper user research

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# Faster, cheaper, deeper user research

by Vijay Kumar and Patrick Whitney<sup>1</sup>

*As told by Vijay Kumar and Patrick Whitney, the Illinois Institute of Technology's Institute of Design and Tsinghua University's Academy of Art and Design in Beijing are creating a set of "activity-focused" research methodologies and a prototype database of research results. The goals are to identify unfulfilled culturally centered design opportunities and to increase the speed and success of innovating in new geographic regions.*

In yesterday's one-size-fits-all world, big companies could often migrate something that was a hit in the US or Europe by tweaking the language and advertising and funneling a lot of money into local marketing efforts. Germany's Mercedes-Benz, for example, traded on its reputation for building highly engineered automobiles to drive into foreign markets. Japan's Sony Corporation found that compact, economical, and reliable electronics, such as the Walkman, struck a chord with people everywhere. Coca-Cola Co. and Philip Morris's Marlboro cigarettes traded on their American-ness to create large overseas followings.

Things have changed. No company can safely assume there will be viable foreign markets for an existing product, and any company seeking to expand globally needs to ask if its offerings are culturally and socially appropriate for its targeted market. Today,



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Western companies that are strong in their local markets are paying a great deal of attention to the growing number of people with expendable income in China, India, Brazil, and other developing regions in which the cultures are very different from those in the West. While some categories of products and services will succeed in these new markets in spite of, or in some cases because of, their association with modernity and the West, many more offerings will succeed only if they make critical accommodations to the behaviors, beliefs, and aspirations of local

1. A shorter version of this article was presented at the Tsinghua University International Design Management Forum, September, 21, 2002, and published in the Chinese journal *Product Design* (Issue 4, March 15, 2003) and in 2002: *In Motion*, a publication of the Future Design Days conference, Sweden, January 2003.

cultures. An example of this insight was given by Gerald Levin, former CEO of Time-Warner, who once held a board meeting in China to help his colleagues, who wanted to focus on “the China market,” to realize that there were actually about 30 “China markets” created by the country’s diversity of geography, climate, religion, economic status, language, and other influencers of culture.<sup>2</sup>

To complicate matters for companies, pursuing new customers around the world is no longer a strategy exclusive to Western megabrands. Strong businesses in developing countries are expanding into new markets. A prime example is Legend Computer, China’s largest computer manufacturer, which is rapidly growing by using great design to serve the diverse needs of the Chinese population.

One of Legend’s innovations is a PC designed specifically for elderly people. Instead of a keyboard, it has a touch-sensitive screen that displays, at all times, large icons for topics like Family, Friends, Pets, Medicine, and Hobbies. Legend has designed another model to appeal especially to families. This computer features a large, physical button on the keyboard that rotates, clicking to several positions. Each position sets the computer to the favorite programs and configuration of a family member, allowing him or her to personalize the computer without having to navigate through a single menu.

Legend, along with Apple Computer, stands apart from all other PC manufacturers in creating products that are based upon a deep understanding of user behavior. They are using this understanding to create value-added products for the diversity of markets in China, and they will soon extend their human-centered approach to create products for markets outside China.

As more companies from diverse countries create offerings for a market, people have more choices, making it increasingly difficult for a single company to figure out how to produce an offering that wins. In this environment, companies need sophisticated information and ever-faster reaction speed. Is it possible to win this race?

### **How companies try to understand consumers**

There are two general types of research that companies use to understand new markets.

The first type, *product-focused research*,

typically uses surveys, focus groups, interviews, home visits, and usability tests to ask customers about existing or prototypical products and services. The strength of this type of research is that it leads to specific insights about the offering, enabling the company to fix problems or add features. It can be fast and practical, and it can lead to statistically valid conclusions about important details. Perhaps most important, if a prototype of a new offering is examined by a sample group, these research techniques can tell you if they hate it—a good thing to know early in the process. The problem with this type of research is that its results almost never lead to insights that could translate into large-scale improvements. Discoveries drawn from focus groups and surveys are almost always limited by the participants’ current expectations. This is perfectly fine if your goals are limited to incremental changes, and if you are sure that none of your competitors are about to launch something that meets users’ needs in a fundamentally better way.

The second type, *culture-focused research*, uses measures like census-taking and demographic data to look at general patterns of daily life: value systems, for instance, or social structures and relationships among friends and relatives. This sort of research can lead to surprising discoveries about a culture. A company can learn, for example, that increasing numbers of families have two people earning salaries, that more people are

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2. Conversation with Patrick Whitney at the Aspen Institute 50th Anniversary Symposium: Globalization and the Human Condition, August 19-22, 2000.

getting high-school educations, and that people are putting more value on the privacy of their personal information. This research will give deep insights into behaviors, beliefs, and goals, which can in turn be used to think, in a general way, about the products a company is planning to launch.

The findings from this type of research, however, are seldom specific enough to help a development team improve the offering they are trying to create. Because this research is time-consuming, while development time for companies only gets shorter, it's difficult to use efficiently.

It's easy to see the dilemma here. Which type of research is more useful: the one that is more practical but often does not lead to new insights, or the one that leads to major new insights that are nevertheless difficult to apply? Of course, the answer is that companies usually do some of both—and hope for the best. But there is a third way.

#### **Activity-focused research**

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At the Institute of Design, researchers have developed a set of *activity-focused* methods that can be applied rapidly to the process of developing new products and services. Using these tools, companies can quickly make surprising discoveries

about a new market. We achieve this neither by looking at the specific product nor by looking at the general culture, but by focusing on people's activities when they are using a product or service a company wants to develop. As an example, for a company that makes kitchen appliances, we would look at family activities about cooking, eating,

and drinking at home. We would examine and seek to understand all the activities of meal planning, shopping, preparing and serving the food, eating, and the necessary cleanup at the end. During observation, we would naturally look at the way people use products. But by looking at the broader activities surrounding the

use of the products, we learn much more about the problems users encounter and what they hope to achieve in the process of preparing food. These insights enable the client company's development team to make fundamental improvements in the products and services supporting these activities. Improvements grounded in this research can lead to substantial new benefits for users, making these alterations intrinsically more valuable than incremental changes achieved in a conventional manner.

The technologies usually used for this type of research include small video cameras and related equipment to conduct video ethnography, disposable cameras given to subjects to create photo diaries, and software tools for managing research data. The software tools are used for tagging the video clips as representative of certain activities, making comments about the activities, recognizing patterns of people's behaviors, and extracting insights to help in the development of new products and systems. (A case study using these research methods appears later in the article.)

While demonstrably effective, doing these studies on an ad hoc basis is still expensive, time-consuming, and difficult to manage. But if we systematize the collection of social and cultural data from countries all around the world so that high-quality information can be gathered in less time for less money, we could also reuse our qualitative research when it is relevant to additional inquiries.

#### **Global Companies in Local Markets**

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Global Companies in Local Markets is a corporate-funded research consortium at the Institute of Design that is in the process of creating a shared database of observations and insights about the way daily life is conducted in various cultures.

The Institute of Design, together with Tsinghua University, in Beijing, has begun collaboration on the first phase of this project, exploring the potential of such a database. Our intention is to include other research teams in cities throughout the world. Global Companies in Local Markets aims to help companies understand cultural differences in a timely and actionable way in three application areas: planning products and services for culturally divergent markets; managing brand and

*The Global Companies  
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common to many types  
of design projects*

corporate identity across cultures; and attracting and managing culturally diverse employees from around the globe.

Using established methods, an international body of academics and professionals will generate research content customized by company, project, sector, or industry. Powerful software tools will help manage data collected from the field, gathering and tagging observations, comparing them, and identifying overall patterns and insights. The databases that are created will form the core of a reusable system to benefit multiple projects across multiple cultures.

Companies participating in the consortium will access comparative, quantitative, and qualitative information about different markets. The database will be a dynamic resource rather than a static repository of information, and as it is used it will continue to grow, making its content timely and relevant. Companies will make extrapolations and find insights about products and services based on existing primary information. Tapping into the database, a company could learn, for example, which aspects of an offering would succeed in several cultures and which are culture-specific. Ultimately, such a candid collection of information will aid a company's decision making and increase its odds for success in unfamiliar markets.

The project will yield three outcomes: a "toolbox" of research and product development methods that participating companies can use, a global network of researchers who can help companies apply the new methods to their own projects, and a database of cultural similarities and differences that can help companies create new offerings, form productive cross-cultural development teams, and manage their brands across cultures.

#### **The POEMS framework: A tool for recording users' interactions**

It is standard procedure during user observation for the team working on a project to break hours of video into small segments, make notes about the user activities shown in each segment, and develop insights about innovations that could be designed for the users. This is an extremely time-consuming and expensive process, but what is really frustrating is that the data gleaned can seldom be used for a second project, even if it is similar. This is because each team that is

working on a project develops analytical frameworks, a set of values tied to the project, and even a type of language for describing the users and innovations. The way they tag the video and photographs is also idiosyncratic to the project.

The Global Companies in Local Markets project is working to develop a database that relies on a small number of frameworks common to many types of design projects. This will require some common use of language and frameworks that define the types of things observers should tag when they are analyzing tapes and photographs.

Our prototype software tool uses four frameworks, dealing with brand, strategy, user experience and user interaction. For example, the POEMS framework helps researchers tag video observations of user interactions by giving them lists of words in five categories: people, objects, environments, messages, and services. The list of words in each category will change depending upon the context. For example, when the team is observing people using home entertainment systems, the list would relate to the people and elements in the home, such as *boy, computer, office, game, internet*. The words would be very different if they centered around healthcare workers using medical equipment in a hospital—for example, *doctor, stethoscope, office, patient records, or information retrieval*. Because the framework will be able to cross subject areas (like home entertainment and professional healthcare work), some of the observation data will be reusable.

Figures 1 through 5 show screens from the software tool at various steps of the process. These screenshots are taken from a study under way at the Institute of Design on understanding the activity of "entertaining at home" across many cultures.

*There are so many companies trying to expand... and their markets are growing and changing so quickly, businesses will need to be much faster and more efficient in mining useful insights if they are to succeed*



**Figure 1.** Gather observations.

In this step of the process, software tools allow researchers to log observations collected from the field. These observations might come from video, still, and disposable cameras, field notes, personal digital assistants, and other tools. Individual observations, for example, video clips, can be viewed and edited using the video control panel. Languages unfamiliar to the researcher can be auto-translated and displayed as a scrolling text on the video panel. Data fields allow the researcher to enter the relevant reference data about each observation, such as date, time, location, and others. Later, searches can be performed based on these reference data to facilitate active browsing. The active video clip shown here is an observation about children playing computer games at a home in Shanghai, China. The lower strip of images represents other already-logged observations in the form of video clips, still images, and field notes, any of which can be activated at any time.



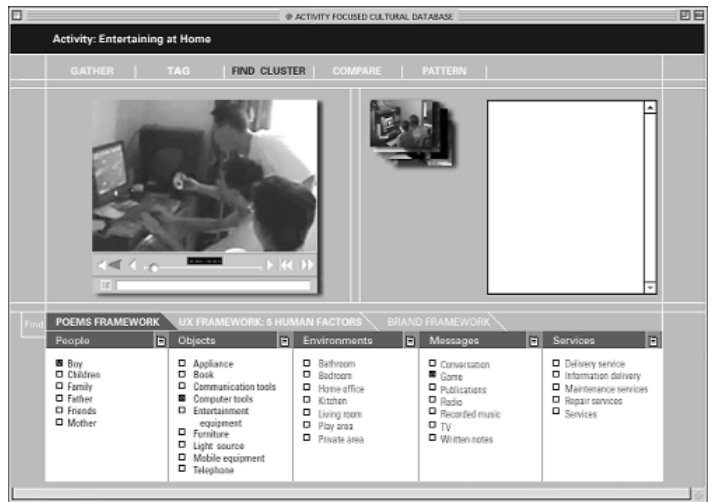
**Figure 2.** Tag observations with POEMS framework.

Another step in the process is tagging individual observations within a comprehensive framework, like POEMS (people, objects, environments, messages, and services). Possible keywords for a specific observation are listed under the framework categories. In this screenshot, a video observation about children playing on a computer in a Chicago home is being tagged to the appropriate keywords of the POEMS framework. The researcher can also enter more-detailed notes in pop-up windows about the observed behavior as the tagging proceeds.



**Figure 3.** Tag observations with user-experience frameworks.

This screenshot shows how a particular observation can be tagged to a UX (user-experience) framework consisting of five human factors: physical, cognitive, cultural, social, and emotional. Here, for example, each of the relevant criteria under Cognitive Human Factors (listed on the left) can be tagged to the active video clip by scoring on a five-step scale. During scoring, the researcher can also note the rationale behind scoring in the text field (shown on the right). These notes are useful for other teams accessing the database later for a different project, especially when they are from a different culture than the original team.



**Figure 4.** Find clusters of observations.

As research teams in different global markets continue to build the database with more and more observations, the database becomes richer in content. Analytical tools help look at this rich set of observations in many ways to gain insights about overall behavioral patterns and user preferences. One such tool is “find cluster,” which helps the researcher group observations based on selected criteria. Shown here is the use of the POEMS framework to find all observations that relate to boys playing computer games (“boy,” “computer tools,” “game”). Once the cluster is identified, the researcher can study its observations to mine insights about boys’ common behaviors while playing computer games. The tool also offers text fields in which the researcher can enter notes. The clusters, along with the notes, will be saved in the database for later retrieval by other teams.



**Figure 5.** Compare clusters of observations.

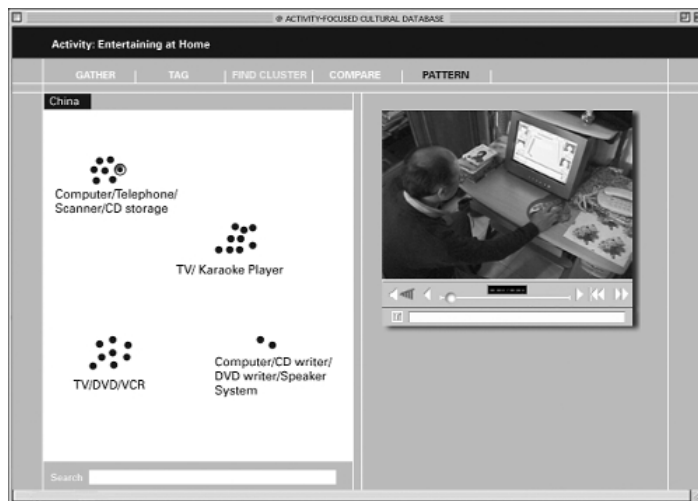
Another tool facilitates comparison between the clusters. Here two clusters of video clips can be simultaneously analyzed to understand similarities or differences. In this example, the activity is children playing computer games at home in two cultures—China and the US. Behavioral differences between them while they engage in this activity can be understood visually and simultaneously. Such comparisons are valuable to help companies fit their innovations to specific local markets. As in the other steps, insights about cultural differences can be noted and viewed in the text field.

### Case study: The Hong Kong interactive home

Using these activity-focused methods, the Institute of Design, supported by three major Hong Kong companies, conducted research into the interactive home. The purpose of the project was to see if activity-focused research could help companies develop value-added offerings rather than the usual offerings from Hong Kong, which tend to emphasize low cost and quick development. This research yielded rich and varied concepts for practicable products and services.

Hong Kong has more fiber running through it than any other city in the world. As such, it's an ideal place to launch products and services for wired homes. The three companies supporting ID's research work—Gold Peak Industries, Hong Kong Telecom, and Motorola Consumer Systems Group—were certain there were great business opportunities in the interactive home in three specific arenas: home entertainment, home security, and home control.

Our work began by observing several families over six weeks while they were at home, shopping, and in other places related to home activities. Our research confirmed that the three arenas predicted by the executives did indeed exist. We surprised our sponsors, however, by identifying six *new* arenas of daily life—storing



**Figures 6 and 7.** Recognize activity-based patterns.

During the previously described steps, a rich set of insights emerges about people's activities in culturally diverse situations. Going through these insights, innovators can also extract overall patterns that interest them. These patterns will be important for companies to consider when they innovate for local markets. Two examples of extracted patterns are shown here, based on our observations on the use of products at homes in Shanghai (China) and Chicago (US). The pattern here shows the frequency with which digital products are used together, as a group, to support people's activities. The dots represent occurrences of observations in the database; by clicking on a dot, a researcher can activate the related observation and study it further.

supplies and other items, keeping up the apartment, balancing the budget, staying in touch with family, helping children learn, and buying fresh food—providing a base for significant new business. Equally important, we uncovered some deeply held values, which we established as governing criteria for any innovation in Hong Kong homes. These were identified as continuous contact, saving time, family values, the new Chinese identity, and higher thinking abilities. The first two criteria probably exist in all modern cultures, but the last three are likely to be more particular to Hong Kong culture, and they were very

strong. To win the approval of Hong Kong consumers, we believed, every innovation should support at least one of these criteria, and equally important, no innovation should be in conflict with any of them. We used our new criteria as guides in three of the new arenas we had identified: families staying in touch; helping children learn; and buying fresh food.

#### *Families staying in touch*

Not long ago, women stayed at home in Hong Kong; now, 50 percent of them work full-time. In Chinese society, where caring for elderly parents, as well as young children, is a traditional

family obligation, the strain on dual-income families is tremendous—so much so that, for the first time, grandparents are moving into their own apartments.

We observed people trying to cope with these circumstances by carrying a second mobile telephone just for family communication. Photographs and notes displayed at

home were reminders of important relationships. We found message boards used to post schedules for the care of grandparents living on their own.

We proposed a system called Homebase, which gives families a continuous connection that is more informal and effective than the mobile telephones most Hong-Kong families use. One Homebase product and service, PictureU, has a small, flat screen resembling a picture frame. PictureU features a data link that can be tuned to another person's home. It is very much like the links used in some daycare centers that allow parents to "look in" on their children, but PictureU can be targeted toward the market for family-based elder care. Glancing at the image, whose scenes can be updated every two minutes and can even be captured and displayed as photographs, is like looking into another room of the house to check on a family member. The device can also be used to track changes in critical health conditions reported by wearable

monitors.

WatchIt is the reverse concept. Imagine a child wearing a small videocamera that is always on. When he feels he is experiencing something he wants to share with his family, he presses a button that saves the previous 10 minutes and continues to record until it is turned off. The child controls what he shares, and does not have to know in advance that he will be participating in something of interest to his family.

#### *Helping children learn*

In Hong Kong, the majority of the population has reached the middle class, making learning and succeeding in school exceptionally important to everyone. Yet, given Hong Kong's poor educational system, parents commonly feel compelled to instruct their children for hours each evening—a practice known as "stuffing the duck." In one home, for instance, we observed a boy whose mother prepared daily lessons, which she posted on the family's apartment walls so that they were always present for her son. Meaning well, but lacking guidance, parents try hard and spend lots of money on supplemental education materials, but to little effect.

Thinktank proposes a set of products to connect schools, parents, and teachers. Using Thinktank, parents and children would get access to information supporting work the child is doing in school. TeacherLink connects parents with teachers so that parents can get advice. LogBook links parents and child so that while the parent is at the office, he or she can drop in to help while their child is doing homework. Thinktank includes a foldaway table, with a flat screen, dedicated to a child's at-home learning. (This too is an accommodation to a Hong Kong condition. Real estate prices have grown even faster than family incomes, and small apartments often do not have space for a table dedicated to a computer.)

#### *Buying fresh food*

Fresh food in Hong Kong, as in much of Asia, means the fish is still swimming and the chicken still has feathers on it. Regardless of income level, half the families in Hong Kong shop for food at a wet market every day. Traditionally, mothers would shop both in the late morning and the late afternoon, but this is a time-consuming process, and the pattern is now to go

*The challenge for companies that want to grow into unfamiliar markets is not only understanding the new cultures, but also doing so quickly*



once, toward the end of the day. Supermarkets have become an alternative for late-afternoon shopping, even though the quality is not as good as a wet market's. Shopping at the end of the day means the stores and roads are more congested and the experience is likely to be unpleasant.

Foodchain would help people in Hong Kong shop at any time of day, using the vendor and wet market they like. Food is delivered at the time it is to be prepared. Foodchain would work in the following way. At the market, the customer gets a basket and a scanner; she selects produce and other items, debiting the price of the food as it goes in the basket. Live fish and chickens are tagged, recording both the purchase and the time the vendor should butcher them. All the purchases are left at the market and delivered to the customer's apartment at a time specified by the shopper.

Hong Kong executives were given innovations that had not existed in previous projects about interactive homes. These proposals delivered the distinctive value needed to create great brands. All the proposed innovations used existing technology—making them less expensive—and they were based on existing cultural norms and known patterns of daily life, making them less risky to develop as business offerings.

The methods we used in Hong Kong could be applied elsewhere. These innovations could be extended to other parts of the world where families feel disconnected, where helping children learn is important, and where shopping for fresh food is important and difficult. For example, with modifications based on local patterns, Foodchain could probably be used in France, where there is a passion for fresh food comparable to that in Hong Kong. The company that changes busy consumers' expectations about selecting and receiving fresh food at home will "own" the service in the same way Sony "owns" the Walkman and the world of portable electronics.

### **Cultural sensitivity and business success**

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There are many examples of companies that have worked hard to modify their offerings to fit large markets that were initially unfamiliar. In China, Kodak's market share has grown to 63 percent while Fuji's has shrunk to 25 percent, in part because Kodak's 8,000 micro-stores created a system that responded to the desire of many

Chinese to run their own small businesses. A major reason that KFC has become one of the top restaurant chains in China is that it quickly modified its menu to include rice, soup, and Chinese breakfast porridge.

The challenge for companies that want to grow into unfamiliar markets is not only understanding the new cultures, but also doing so quickly. Activity-based research is a key method for gaining deep insights about the details of local culture. There are so many companies trying to expand in this way, and their markets are growing and changing so quickly, that businesses will need to be much faster and more efficient in mining useful insights if they are to succeed. Observation tools and databases like those discussed here offer a set of technologies that can make it possible.

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