Institute of Design
ILLINOIS INSTITUTE OF TECHNOLOGY

# User Insights Tool

## A Sharable Database for Global Research

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**Abstract**
Companies looking to expand globally need to recognize differences in people's activities in culturally unfamiliar markets. They need tools for observation-based, activity-centered research to tailor their offerings for successful adoption. A sharable database tool called "User Insights Tool" is being prototyped at the Institute of Design for doing faster and deeper activity-centered research. The database tool is based on flexible frameworks that can work across multiple projects, teams, and cultures. It includes tools to gather observations about people's activities, sort, analyze and share this information, and identify undiscovered patterns of activity that can help inspire innovation.

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**Introduction**
Companies strong in marketing their offerings to their local markets find it difficult to successfully enter new, culturally unfamiliar markets. This is mainly because they underestimate the differences in the patterns of daily life in different cultures and therefore fail to meet people's culture-specific needs. For example, Whirlpool's "World Washer", designed to be a one-size-fits-all machine, was introduced as an important part of the company's global strategy into the Indian market in the late eighties. But it failed dramatically because its designers failed to study what most women wore in India. Sari, a 30-foot long cloth commonly worn by Indian women, got tangled in machine paddles and caused abrupt water and electrical stoppages in mid-cycle. Companies wanting to expand globally need to recognize the differences in people's lifestyles in the unfamiliar local markets they want to enter and thereby tailor their offerings for successful adoption.

To address this need for culture-specific knowledge, companies' research focus need to shift from "products" to "activities". By understanding the user activity patterns in their cultural contexts, companies will be able to tailor their offerings – products and services -- to the specific user behaviors in the targeted local markets.

Companies that want to focus their research on "activities" predominantly use methods like ethnographic research, which social scientists practice as a basis for inquiry. Leonard and Rayport (1997) emphasize the value of ethnographic research to understand how people interact with products, environments, and services and provide many illustrations of its relevance to business innovation processes. Ethnographic research primarily produces qualitative data. To gain actionable insights about user needs and behaviors, structured methods are needed to code and analyze this type of data. Miles and Huberman (1994) suggest focused qualitative data analysis through a series of steps to organize information that can lead to a conclusion and action. A commonly accepted method for analyzing qualitative data is 'grounded theory' pioneered by Glaser and Strauss (1967) who argue that theories emerge from the research data, continuously improving the understanding of the significance of

what is observed and discovered. Strauss and Corbin (1998) further extend this theory to explore analytic techniques for the application of grounded theory.

Many studies also point to the importance of cross-cultural ethnographic research for innovating in the global market. Harel and Prabhu (1999) discuss strong cases for exploiting ethnographic research as part of the global product development processes companies use. Salvador, Bell, and Ken (1999) point out the importance of ethnographic studies that can reveal people's culture-specific needs for companies to consider in their innovation efforts. Cain (1998) and Robinson (1993) argue that researchers need to deeply study experiences people seek within particular cultural contexts to make sure that what is being innovated fulfill their needs and desires.

Studies that strongly argue for cross-cultural ethnographic research also point to the need for efficient tools. Following the structure of grounded theory, there are many general-purpose tools like Nvivo, ATLAS.ti, Qualrus, and MAXqda that help researchers code and organize qualitative data. NVivo facilitates analysis by linking data sources like formatted text, Microsoft Word documents, interviews, sounds, videos, websites, and others. The tool allows researchers to code and manage the different data sources and supports reiterative searches to find acceptable results. ATLAS.ti contains a set of tools for managing, evaluating, and visualizing text-based qualitative data. Qualrus allows qualitative data analysis in multiple media formats. MAXqda is a software tool to do systematic qualitative analysis of textual data generated by research. But many of these tools are general-purpose in nature and not easily and quickly applied to the specific area of understanding people's activities and interactions with products, media and services through ethnographic research. However, their formalizations help us design special-purpose database tools to manage ethnographic data and frame them to produce meaningful knowledge.

It is common practice for teams doing "activity-focused research" to use databases because they amass findings from the field in one place and thus allow comprehensive analysis. Innovation projects benefit from these databases despite the added effort needed to make them. Many consulting firms have been successfully using such databases to gain insights about users and thereby conceive reliable market strategies for companies. For example, Doblin, a strategic innovation planning firm, has been using a Lotus Notes-based database called Field Research System (Pipino, 2004) for managing ethnographic data. This tool accommodates media types like audiotapes, videotapes, still photos, and field notes, codes observations using predetermined frameworks, and groups observations into "collections".

A study of the current practices in using such research databases has revealed several problems that lead to inefficiencies while companies are innovating new offerings. For example, researchers working on a specific project use project-specific categories and frameworks to organize the data. Because of this, these databases can seldom be used for a second project even if the project is similar in nature. Even different teams working on the same project tend to use their own team-specific frameworks and languages to organize

the data they gather from the field. This makes it difficult to share the data easily among other teams even if they are working on the same project. This problem is more pronounced when the teams are from different parts of the world or they have different cultural backgrounds.

A research system that helps create offerings for unfamiliar markets (Whitney, 2001, 2003) also requires that the research findings be easily shared across teams and projects to increase speed and effectiveness (Kumar and Whitney, 2003).

**Sharable User Insights Database Tool**

A sharable user insights database tool that works across multiple projects, teams, and cultures can be a valuable resource for companies looking to develop offerings for unfamiliar markets. Such a database would have two parts - shared and local. The shared part allows teams to benefit from the work of other teams and projects. The local part helps researchers organize their project-specific data for their local teams. Conceived well, such a database tool can be repeatedly used for many projects, eliminating redundant efforts and raising the efficiency of an innovation process. With the support of such database tools, deeper and faster user research becomes possible.

At the IIT Institute of Design, researchers are developing such a shared database of multi-cultural user insights, called "User Insights Tool", as part of a corporate-funded global research consortium called "Global Companies in Local Markets" (GCLM). The overall goal of this research consortium is to help companies understand cultural differences in three application areas: planning their offerings to fit culturally divergent markets, evaluating brand behaviors in unfamiliar local markets, and building on the tacit knowledge of local researchers around the world. User Insights Tool is conceived to play a major role in all three of these application areas.

As part of the consortium, the Institute of Design, along with collaborators like Tsinghua University in Beijing and the International Design School for Advanced Studies (IDAS) in South Korea, is currently prototyping this database tool. Testing the tool with actual project data is under way. Eventually the Institute intends to include more organizations to build the content of the database on an ongoing basis. Using established methods, an international body of academics and professionals will generate research content primarily organized under people's daily "activities", such as keeping healthy, learning, or entertaining, in various cultures. User researchers who study people's activities in different cultures can use tools in the database to gather data from the field, organize, compare, and identify overall patterns. User researchers can recognize differences and similarities between behavioral patterns in different cultures. They can capture their insights in these databases in a disciplined way. Using the resultant culture-specific insights about users and their behavioral patterns, innovation teams in companies can not only ensure a good fit between their offerings and the target market but also improve their overall innovation process.

The team at the Institute of Design is creating a set of tools to build this dynamically evolving database. The database would form

the core of a reusable system that will help companies with their multiple projects and multiple cultures. Tapping into the database a company could quickly learn which aspects of their offerings would succeed in the different cultural contexts and take quick decision about their possible strategic directions.

**Frameworks that Organize Data**

During observational research, it is standard practice to break down data collected from the field -- videos, photos -- into small manageable segments and write descriptions and develop insights about them that could lead to possible innovations. To make these insights sharable and reusable, the User Insights Tool uses a small number of frameworks common to many types of projects. These frameworks are conceived to be comprehensive in nature so they can accommodate the wide range of user activities that are being observed. The current prototype uses three major frameworks to organize observations and insights – the POEMS (People, Objects, Environments, Messages, Services) framework, the User Experience framework, and the Motivations framework. Data collected from the field are segmented and coded by tagging them to these common frameworks. This ensures quick retrieval, reliable search and deep analysis of these observations by multiple teams across multiple projects.

*POEMS Framework*

The POEMS framework is used to organize the elements associated with the observed activity. This framework has five elements to which observations in the field can be tagged: 1) People - individuals involved in the activity, 2) Objects - things people interact with while doing the activity, 3) Environments - the space, settings, or location where the activity takes place, 4) Messages / Media - information that is being transferred during the activity, and 5) Services - a person or a system offering services to enable the activity. Table 1 shows how a typical observation about an activity, "cooking at home", can be organized using the POEMS framework. Example words that might be used to tag the observations about this activity are shown in this table.

Table 1: Words Related to "Cooking at Home" in POEMS Framework

| | | |
|---|---|---|
| P | People | Mother, Child, Guest, Maid |
| O | Objects | Oven, Refrigerator, Utensils, Microwave |
| E | Environments | Cooking space, Eating space |
| M | Messages / Media | Recipe, Food package |
| S | Services | Delivery, Waste recycling |

The database development team has been facing the challenge of setting up the most appropriate words in the POEMS framework, by finding optimal expressions that are commonly understood across cultures. The tool required a careful determination of such commonly understood words so that researchers in many parts of the world could understand them unambiguously. The tool provides features for global researchers to remotely discuss word selections

and redefine them. The tool is also planned to benefit from physical workshop sessions conducted frequently with research participants from various cultures, so that they could keep terminology updated on an ongoing basis.

The list of words under the categories -- People, Objects, Environments, Messages, Services -- of the POEMS framework will change according to the context of the activity. For example, when researchers are observing the activity of cooking at home, the words they will need in the framework might include Mother, Oven, Cooking space, Recipe, and Delivery service. These words would be very different if the context was grocery shopping – Cashier, Shopping cart, Queuing space, Receipt, Loading service. But some of the words will be common among many activity contexts.

*User Experience Frameworks*

The purpose of the User Experience framework is to relate activities to people's experiences. People's experiences fall under five human factors – Physical, Cognitive, Social, Cultural, and Emotional. Researchers interpret the activities they observe in the field on measurable scales organized under each of these five human factors. The goal is to capture the values people associate with products and services while interacting with them. Table 2 shows some example scales used in the User Insights Tool.

Table 2: Example scales used in the User Experience framework

| | | | |
|---|---|---|---|
| Physical | Right size | … | Wrong size |
| | Easy-to-use controls | … | Difficult-to-use controls |
| Cognitive | Understandable language | … | Confusing language |
| | Understandable symbol | … | Confusing symbol |
| Social | Informal interactions | … | Formal interactions |
| | Co-located members | … | Remote members |
| Cultural | Shared values | … | Values in conflict |
| | Acceptable habits | … | Problem habits |
| Emotional | Bored | … | Interested |
| | Anxious | … | Calm |

*Motivation Frameworks*

Motivations framework is intended to capture the reasons that prompt people to do the activities. It uses scales to measure people's motivations that drive particular activities. Using these scales, researchers take judgments based on their direct observations and what they learn from user interviews. Some of the scales used in the tool to tag activities to motivations are: 1) High priority - Low priority, 2) High enjoyment - Low enjoyment, 3) For oneself - For others, 4) Voluntary – Required.

**Modes of Use**

The first prototype of the User Insights Tool is implemented to work over the web so that research teams located in different parts of the world can access it quickly and test it on actual projects. Although the prototype development team is exploring the many functions that a comprehensive database tool like this should have, a few key

functions are implemented. They are described below.

*Set up a project*
The first step in using the User Insights Tool is setting up the initial information. It would include definition of the research project related to people's daily activities, including a title, such as "Keeping Healthy at Home" or "Playing & Entertaining at Home". Identities of project team members, project managers, and database subscribers are also set up initially to ensure their access privileges. Then, word lists for the three frameworks -- POEMS, User Experience, and Motivation – are entered into the "shared part" of the database by tapping into reference lists already created by experts. In the "local part" of the database, local research teams can add their own words and organize their data to suit their specific requirements, if needed.

*Gather Observations*
Gather function allows researchers to log observations collected from the field into the database. The observations logged could be in the form of photos, video clips, field notes, or other media. Reference data associated with each observation are also entered, such as observer's identity and observation time, date, and place. All these data are searchable for later analysis.

Figure 1 shows a visual representation of the tool's screen during the gather mode. The observation shown here is from a project on the activity of 'keeping healthy at home', conducted by the Institute of Design in Hong Kong. The specific activity is a mother shopping for fresh food in wet markets, a common activity observed in Hong Kong culture. In this mode, the researcher can enter descriptions, facts, interpretations, and insights about the observation that can later be searched, accessed and analyzed by all users of the database.


Figure 1: Gathering Observations from the Field

*Tag Observations to Frameworks*
Another function of the tool is tagging individual observations to the three frameworks -- POEMS, User Experience, and Motivations. Figure 2 illustrates how the activity of 'mother shopping for fresh food' is tagged to the associated key words in the POEMS

framework. Shown here are only a few illustrative key words under each category of POEMS; in a real case the key word list will be much longer. The researcher can also enter notes about the tagging logic, in the comments field for later reference by other tool users.


Figure 2: Tagging Observations to the POEMS Framework

*Find Clusters*

The User Insights Tool becomes richer in content as more and more research on people's daily lives is conducted, and more observations are added to the database. Search tools help look at this rich set of data in many different ways to gain insights about overall behavioral patterns. The find cluster function helps search through all the observations generated by all the projects in the database. Clusters of observations can be quickly found by choosing keywords from the frameworks, reference data, or even from the notes observers have entered. By looking at the resultant clusters, overall insights about people's behaviors can be recognized. These insights become reliable drivers to tailor innovations to fit people's daily activities, especially in culturally different markets.

*Compare Clusters*

Once the clusters of interest are identified, they could be compared with each other using the 'Compare' function. Figure 3 shows two clusters of observations being compared to understand similarities and differences. A search on keywords like learning, boy, girl, homework, and home found a subset of observations from all the projects in the database. This cluster was searched again for two locations -- Hong Kong and Beijing -- revealing two clusters side by side. By focusing on the insights embedded in these two clusters of observations, behavioral differences, or similarities, quickly become evident. Such comparisons are valuable to companies aiming to introduce new educational offerings in these different local markets.

**Early Results**

Early trials with the tool substantiated its advantages for quickly gaining valuable culture-specific insights about people's behaviors and needs. Although a detailed elaboration of the insights that came

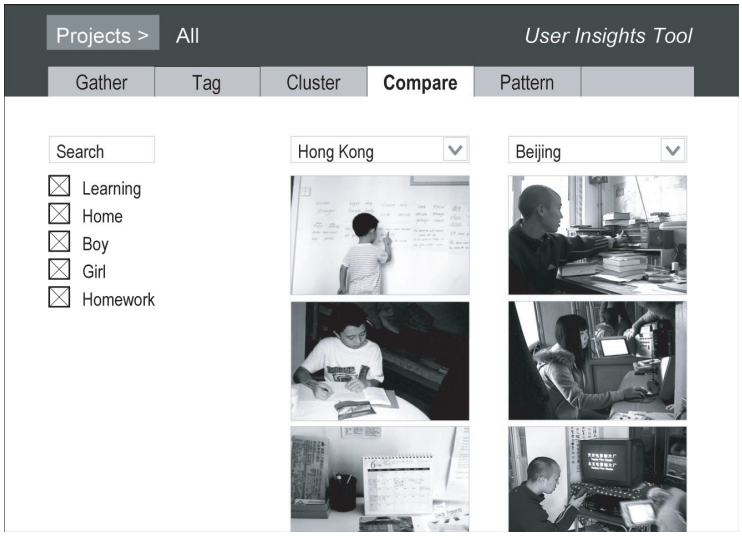


Figure 3: Comparing Two Observation Clusters

out of these trials are beyond the scope of this paper, some examples can be illustrated.

In one trial, we studied the activities related to entertainment at home in Chicago (US) and Shanghai (China). Observations about people's activities like watching TV, listening to music, playing video games, and using computers for entertainment were entered into the database and tagged them to the frameworks. Using the "find cluster" and "compare clusters" features of the tool, searches were conducted and interesting clusters were recognized. Clear indications of how people's entertainment experiences differed in these two cultures quickly emerged. For example, a search for people's activities around the use of "entertainment system" at homes in Shanghai revealed a large cluster of observations that showed family members using Karaoke system for prolonged periods of time. With subsequent queries, we found that this cluster was also tightly linked to "group activities" (social human factor) and "acceptable habits" (cultural human factor). Thus, a quick analysis of observations showed the prevalence of Karaoke as a culturally common, social activity among family members we studied in Shanghai. Whereas, the cluster of observations that emerged for Chicago homes had other predominant characteristics for the same search. Here, the observations showed the "entertainment system" largely as part of home-theater configurations. People's activities were mostly about watching video on a large screen and controlling sound, video, and environmental conditions.

Another example is the insight that resulted from counting the number of times products occurred together at these homes. Chicago homes had a number of occurrences of TV and Washing Machine appearing together. This was not a pattern in Shanghai homes. Karaoke system, TV, and Entertainment system were occurring more frequently in these Shanghai homes than in Chicago homes. These types of distinct patterns that can be extracted by searching through observations in the database are valuable for product system conception.

**Future Directions**

The current prototype is being tested with observational data from various locations at Chicago, Beijing, Hong Kong, and Seoul. Based on the feedback from its use at these locations, the implemented functions of the tool will be evaluated and further improvements will be made. Simultaneously, new functions for the tool are being conceived, especially analytical functions to recognize embedded higher-level patterns. Prototyping and testing these new functions will be another next step. Because of the global nature of this database, overcoming language differences among the tool users is a major concern. Beneficial use of automatic language translation algorithms will be explored. The focus will also be on validating the structure and comprehensiveness of the frameworks used in the tool. Additional frameworks, like Branding framework to study how people perceive brands, will also be incorporated into the tool in the next iteration.

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