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Michael McCoy is the first recipient, with Katherine (Kathy) McCoy, FIDSA, of the Smithsonian's Design Minds National Design Award. His new Humanscale Horizon Light (with Peter Stathis) has won over 20 awards, including the Red Dot and a Gold IDEA, and it's in the permanent design collection of the Museum of Modern Art.

DESIGNER-FRIENDLY USER-RESEARCH METHODS

I am writing this article as an enthusiastic user of innovative design research tools and methods, with no claim to have invented any of them. I have had the privilege to know many of the pioneers in design research, including Niels Diffrient, FIDSA, Rick Robinson, John Cain, IDSA, Steve Wilcox, FIDSA, Paul Rothstein, John Rheinfrank and Bill Moggridge, FIDSA and have embraced and adapted many of their methods to use in my practice and teaching. I differentiate the industrial-strength methods of Wilcox, Robinson and others, which are usually applied to very complex problems, from what I am talking about here. Part of my interest has been on designer-friendly research methods that get the designer out of the studio and into the world to observe how people interact with things in real life.

A Journey of Research Tools

As an educator and an independent practitioner of design, I have always been interested in research tools that are inexpensive and convenient to use, since designers are often under tight time and budget restrictions. The first designer-friendly research tool that I experienced was the Humanscale human-factors chart series co-authored by Diffrient and published by MIT Press in 1974 in the form of plastic cards with thumbwheels that could be dialed to the desired user type. When those became available, I began to see them on the desks of many industrial designers, who were actually using them. They replaced traditional human-factors books, which were difficult and awkward to use when under the pressure of tight time deadlines and with no space on the drawing board for a large book. The Humanscale charts were light and compact and quickly got the designers within close range of the desired dimensions, which they could then confirm and refine with their own drawings and mock-ups. I consider those to be Diffrient's greatest contribution to the profession of design, even greater than his many pioneering furniture designs.

Important tools for me in my teaching have been the use of scenarios, storytelling, storyboarding, graphic novels and acting out design concepts. While Kathy and I chaired the design department at Cranbrook Academy of Art, we assigned a three-day team project at the beginning of each academic year that culminated in each team acting out its design concept as a scenario in a manner similar to a short play. The goal was to get designers thinking from inside the experience, rather than observing it from outside. A typical assignment was to imagine a café of the future and design all the elements of the experience, including dinnerware, furniture, menus, the space, and the servers' outfits and demeanor. As part of the final presentation, the teams acted out the experience of entering the cafe, being seated, and ordering and eating their food. They had to inhabit the concept rather than stand outside of it.

Also at Cranbrook, and parallel to the designer-friendly methods, I assigned projects that encouraged students to express the relationship of form and meaning in products using techniques like shape coding and metaphor. This approach, termed "product semantics" by Klaus Krippendorff

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Wave Seating by Arconas, designed by Curtis Fentress and Michael McCoy, IDSA.

and Reinhart Butter, L/IDSA, referred to the shaping of products to communicate their use and cultural context. One key project, the Phonebook designed by Lisa Krohn and Tucker Viemeister, FIDSA, became emblematic of the approach with its form reference to a personal address book and the ergonomic performance of turning the pages to access features like recording the greeting. These projects were realized as high-resolution models and published to communicate the theories of product semantics. I considered the development of designer-friendly research and the experimentation in form and meaning to be complementary to each other; the form research demonstrated how objects can communicate their role in people's everyday lives. During that period we also ran workshops for Philips Electronics, organized by Robert Blaich, FIDSA, which combined the methods of storytelling and scenarios with the theories of product semantics.

In 1996 after directing Cranbrook's Design Department for 24 years, Kathy and I moved to Chicago to join the faculty at IIT's Institute of Design. There we were focused on adapting the advanced user-research methods being developed by fellow teachers like Robinson and Cain. I used some of those adaptations in the advanced product-design workshop I taught. In the first half of the semester, I asked the graduate students to research a particular issue; in the second half, they developed innovative products or services based on their research. This required the student teams to use analytical research methods like shadowing and scenarios to identify product opportunities and then shift to generative techniques to conceive product ideas. I also encouraged fast looping of early research insights into rough field prototypes using cheap materials like cardboard and duct tape that could be quickly taken to field sites, tested with real users in real situations and quickly modified. This emphasis on speed responds to the ever-shorter time-to-market demands of industry while ensuring the product meets people's real needs.

Integrating Approaches

The techniques we developed relied on observation frameworks previously developed by our colleagues. Robinson's AEIOU framework for observation ensured that all aspects of a situation—activities, environments, interactions, objects and users—were observed and noted. Rothstein's AAAA framework (actors, activities, artifacts and atmosphere) for observation had similar goals and was developed to make the observation process more accessible and efficient for designers and researchers.

Some of the methods I found useful in the workshop were shadowing and field prototyping. Shadowing is a technique easily used by teams for recording users' experiences—for example, while they navigate through a public space. In one project, a student team looking at the home-improvement phenomenon shadowed a team member with a video camera as she measured for window blinds in her apartment and then went to Home Depot to purchase the blinds and necessary hardware and tools. One proposed product that evolved was a personal user page on the Home Depot website in which the user can record pertinent data at home, such as measurements and photos of the room, and later access that data in the store from a touch-screen display on the shopping cart. The software also advises what hardware and tools must be purchased and provides a map of store locations.

High Ground

Bill Moggridge, FIDSA teaching at High Ground with scenario images in the background.

Field prototyping involves making a usable rough prototype of the proposed product from cheap field-modifiable materials (like cardboard and duct tape) and taking the prototype out to be experienced by typical users. If it proves to be too big or too small it can be changed immediately on site and confirmed by the users. This shortens the design cycle, eliminating the need to take the prototype back to the shop for modifications and then returning to the users for verification.

In the workshops we illustrated scenarios with storyboards and techniques borrowed from graphic novels. The graphic-novel format enabled us to show people interacting with things in situations and to use talk balloons to communicate what they were saying and thinking. This analytical tool visualizes the research and is an effective generative tool to synthesize design concepts.

At the same time at the Institute of Design, Kathy developed methods for audience-centered design. She developed audience analysis tools for the discovery of design criteria appropriate for diverse interpretive communities, including their individualized communication styles with language, visual and verbal signs, and media preferences. The insights gained from audience-centered research enables designers to tailor their communication solutions to speak comprehensibly and resonantly to specific audiences in our world of subcultures. This was an application of our interest in designer-friendly research tools.

When Kathy and I left the Institute of Design in 2003 to live and work at our home and studio in the mountains of Colorado, we built a small seminar center to house our High Ground Design Workshops. In our workshops for Timex, McDonalds, Steelcase, IDSA and others, we combined the studio experience of Cranbrook and the designer-friendly research methods we had developed at the Institute of Design. Our fellow faculty for the workshops included Moggridge, Viemeister, Robinson, Hugh Dubberly, Cain and many others. Teams used storytelling and scenarios to describe situations in people's lives and identify products and services that could enable desired outcomes. The techniques of graphic novels were used to show people in situations interacting with objects and each other. The final team presentations involved acting out scenarios with quickly made physical props representing the products. The process of acting out challenged the designers to be directly involved in using the product in contextual situations so that they could experience the interactions between the product, the people and the environment.

Research in Use

I recently had the opportunity to use some of these research tools to co-design a new generation of airport seating for Arconas, a leading industry manufacturer. I collaborated with Curtis Fentress of Fentress Architects, the architect of such influential airports as Denver International, South Korea (Incheon) and the new LAX International Terminal, to develop airport seating that supports the needs of modern travelers. Through observation, photography and interviews with travelers, we concluded that people need several key things that are missing in most airport seating: a place for their drink, a place for their food, a recharging outlet for their mobile device and more room under the seat for their luggage. We recorded images of people in business suits crawling on the floor looking for a recharging outlet and travelers spilling drinks on the floor or the next seat while balancing a sandwich and an iPad on their lap. Other scenarios include waiting-area discomfort for families traveling with kids and elderly parents.

Our design is based on the concept that every seat is the best seat in the house. Even if the only seat left in a crowded boarding area is in the middle of the row, the passenger will have a cupholder, a large flat arm surface to hold food and a mobile device, a recharging outlet (and wireless recharging in some arms) and more room under the seat for luggage to keep the aisles clear. The Wave Seating will be installed in airports globally to make travelers a bit more comfortable while waiting for their flights.

Recently a new research program called dScout (www.dscoutapp.com), where researchers can sign up and create studies, has been developed by Chris Conley. This mobile Web platform enables ethnographic research to be conducted on a larger scale and at a lower cost than previously possible. Clearly there is a growing interest in making design research methods and information much more available and usable for designers.

I have found that designer-friendly research methods can be highly effective in identifying new product opportunities, even if there is minimal time and money in the budget for extensive research. These tools get the designer out of the studio to observe real-life situations that reveal and inspire innovative product solutions. ■