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# Projective Techniques for Projection Technologies

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## **Abstract**

To facilitate the development of a new home-entertainment device (a portable projector with built-in speakers and a DVD player) we conducted in-home interviews that explored home entertainment activities, presented a demo of a rough prototype, and brainstormed with participants about future refinements.

Our research revealed that people use TV in a variety of ways, from special events to background noise. Although the device was intended only to support special event viewing (being brought out for special events and then stored when not in use) we found that the unrefined nature of the prototype led respondents to expect that the eventual product would support any and all of their TV usage modes,

The critical recommendation was that if (as planned) the final product would not support those viewing modes, it must be crystal clear (through a consistent story of design, pricing, and features) how it can and can't be used.

## **Keywords**

Anthropology, Audio, Business Strategy, Concept Design, Entertainment, Ethnography, Experience

Strategy, Home, Industrial Design, Marketing / Market Research, Participatory Design, Product Design, Prototyping, User-Centered Design / Human-Centered Design, User Research, User Studies, Video

### **Project/ problem statement**

Hewlett-Packard (HP) was exploring the potential marketability of a prototype home-entertainment device (codenamed Zoetrope) - a portable home projector with a built-in DVD player and speakers to be used for occasional viewing. HP had identified a gap in the market for products aimed at the everyday consumer (versus the audiophiles and videophiles normally targeted by new technologies), and had developed proprietary technologies that would potentially deliver an exciting home viewing experience. In order to make strategic decisions about further development of Zoetrope, the product team sought to understand the appeal of the concept to home users, barriers to adoption, installation, and usage, issues around price-point, and technical performance expectations from the everyday consumer.

### **Background**

Hewlett-Packard was engaged in an ongoing quest to move beyond selling just computers and printers to consumers; breaking into the living room with new entertainment devices. In the final quarter of 2002, they engaged Portigal Consulting to conduct user research with everyday (i.e., non-audio/videophile) consumers, in order to better understand the appeal of the Zoetrope concept, identify directions for future development of the product, and inform the roadmap for possible launch.

### **Challenge**

In this program we faced the challenges typical to many consulting assignments. Based on our data and our synthesis, we were able to inform both tactical and strategic issues for HP, but as outsiders to the organization there were always some missing piece of context that would limit the impact of our recommendations. For example, before we were involved in this assignment, HP had worked with a product design consultancy to create a range of conceptual mockups that would demonstrate possible form factors for Zoetrope. Ideally, how it works (HP's technology), how it looks (the design firm), and what it means (the ethnographic study) would all be developed in a parallel effort, but organizational politics dictated that it be handled in stages. The purpose of the first round of conceptual form design was to get internal buy-in for the development program and so was kept separate from the user research phase. But follow-on phases of product design (those leading to the final form factor) took place months later without our involvement. Furthermore, HP was deferring the strategic issue ("How do we get into the living room?") by driving forward with the tactical issue ("What features do we put into Zoetrope?"); in essence the tail wagging the dog. Further, the strategic question straddled multiple product departments across multiple facilities and couldn't possibly be resolved by this product team even though this strategic approach was ideally needed to inform the tactical decisions about Zoetrope.

### **Solution**

#### **A. Process**

To help HP move forward with Zoetrope, we recruited

consumers in Denver to participate in home interviews. We chose Denver as it represented a mid-sized “typical” city that was near the West (where the HP team and the research team was located) while still maintaining some veil of confidentiality in the early stages of a development process by avoiding any possible encounters with the technology or entertainment professionals found in most West Coast cities.

Our original plan was to conduct one intense round of interviews with 8 consumers, but we discovered internal goals at HP that suggested a benefit to spreading the data collection into two mini-phases. HP was looking to present Zoetrope at several tradeshow events and as a result we used the first round of research (4 families) to collect some first impressions and begin to synthesize results. We took a 6 week break (including December holidays) between rounds of research, allowing for some organizational progress at HP where key meetings to clarify goals were held and more input from stakeholders was obtained. Living with the observations and findings from the first round of research also proved to be an important luxury.

The second round of research was conducted with 5 consumers in Denver, with a slight shift in the social-economic parameters. The interview guide (a document that informs but doesn’t limit the interviewing process) was iterated to reflect the questions that emerged from the first round.

Overall, the participants were the target customers for Zoetrope: active users of home entertainment technologies such as video games, DVD, videotapes, and pay-per-view movies. We spoke to families with children living at home (as well as one empty-nest and

one DINK or Dual-Income No Kids) and we met with all household members at once.



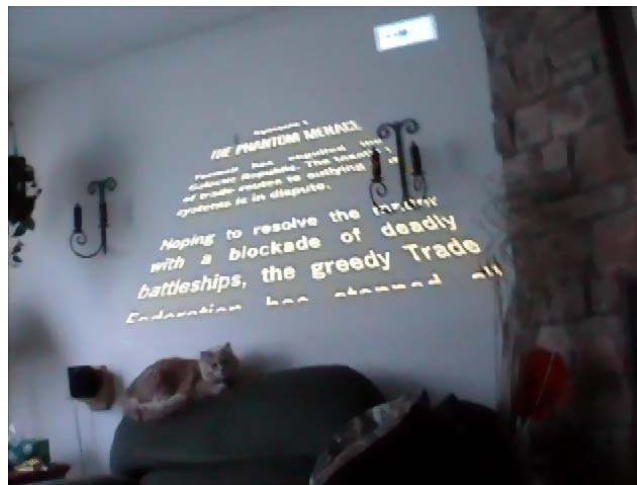
**Figure 1.** The field research explored current home entertainment behaviors.

The field research methodology was a near-seamless combination of several tools: open-ended interviewing, participatory design, and concept testing. We began each two-hour session with an exploration of current home entertainment behavior and then transitioned to a demo of the Zoetrope prototype, seeking both an evaluation of the prototype but also projecting into the future to consider the impact of a productized version.

In projective interviewing (adapted from psychology), participants are presented with an ambiguous stimulus and asked to respond freely. The Zoetrope prototype was ambiguous enough in its rough state that it was well-suited to this technique; participants used their imagination when considering how Zoetrope might one day fit into their lives and their homes.

This is contrast to evaluation, where an artifact or stimulus is presented and evaluated in its existent form. The market research technique of concept testing is often more evaluative than projective, and thus is used later on in a development process.

Projective techniques can also be a questioning technique, without an artifact as stimulus. For example, “How do you expect your children will watch TV when they are your age?” is a projective question.



**Figure 2.** Deming the Zoetrope home theater experience

The prototype itself was a “breadboard” – in other words, a works-like device that proved the concept in terms of technology. It was assembled by engineers using whatever components were available, with no

attempt to provide a brand, aesthetic, or user interface experience in the form itself. Because this was a home theater device, there was much to be experienced outside the form of the artifact itself – in other words, watching and listening to the movie that the Zoetrope enabled.



**Figure 3.** The Zoetrope prototype (left).

Fortuitously, this breadboard was at the right level of refinement for the study. Given that consumers are not sophisticated in understanding the limitations of a prototype (i.e., in a recent study of printed collateral, consumers mistakenly interpreted the “greeked” text of “Lorem ipsum dolor sit amet” to mean that the collateral would be available in multiple languages) the Zoetrope prototype was very effective. It bore no resemblance to an actual product, and so the consumers were very willing and able to project – to express interests, wants, and desires unconstrained by what they saw in front of them.

In the first phase of research, the prototype was damaged in transit (providing an early learning for the team that electronic prototypes should not be casually

shipped via the checked luggage compartment). With only hours to prepare for the first few interviews we discovered that the audio capability was not working. Without tools or replacement parts on hand, we set out to conduct our interviews anyway, stopping en route at electronics stores to get similar parts, and conducting ad hoc repairs in the back of the rental car and on the table at a Mexican restaurant. While we ended up conducting some interviews without the ability to experience the audio quality, we turned this limitation into an opportunity, and developed a line of questioning around expectations of audio quality (based on the video quality and other factors) rather than an evaluation of the audio experience. This was a serendipitous use of projective interviewing; asking the research participant to go beyond what they were directly experiencing into what they would want, need, or anticipate.

#### B. Solution details

In our research, we discovered that family entertainment time was important, whether it was a regular family show on TV, a planned dinner/movie outing or group rental at a scheduled time.

Viewing activities broke into several different types (and most households identified with only or two on the list, despite exhibiting all behaviors at different times)

- Event (sports, family viewing, may include rituals such as turning off lights or lighting candles)
- Regular TV shows (always watch or record every week)
- Hunt – turn the TV on, flip to find something to watch, otherwise turn it off

- Wallpaper – the TV is always on, viewing may start and then stop, almost at random to integrate with other tasks

People implicitly divide their homes (not to mention their entire selves) into front stage and back stage [1]. Front stage is the more public area (i.e., kitchen, living room, front yard) where families display their aspirations to the rest of the world, while back stage is the private areas (i.e., bedrooms, office, computer room) where people will act as their private selves. There were substantial objections to the notion of having a big screen TV in the living room, as one respondent proclaimed “our lives are about interacting with people, not about focusing on the television.”

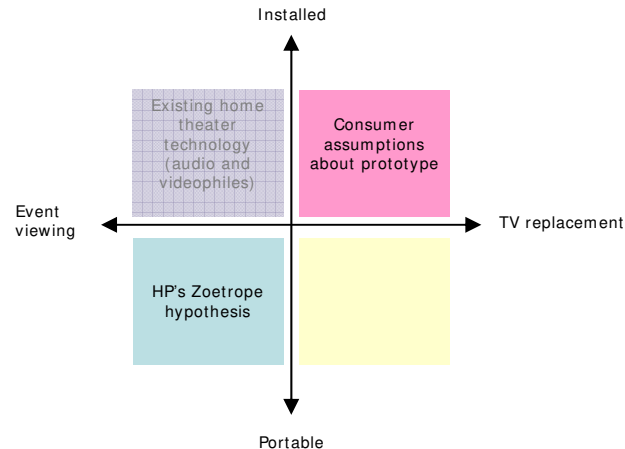


**Figure 4.** Respondents imagined the impact of the Zoetrope on their environment and on their behavior.

Some respondents told us that they would “get rid of the TV” after acquiring a Zoetrope (where Zoetrope was their dream device, a full-featured Rube Goldberg technology that would do anything and everything). Even if such a Zoetrope were made available, the highly entrenched nature of the TV as an established solution suggests that although the idea is appealing in the context of an interview, it is not a likely behavior (and certainly was not HP’s goal).

This points to the highly inferential nature of ethnographic research. Rather than simply capture what people say (as in a survey), we filter what they say through what we observed (what they do, how they say it, and what the culture tell us).

These concerns and behaviors drove participants to consider the impact of a product that would offer a big-screen experience without the burden of massive hardware in a front stage area. Indeed, the rough nature of the prototype led participants to hypothesize how they might use Zoetrope for all other forms of viewing besides the (default assumption of the) Event, asking for installation and dismissing portability.



**Figure 5.** HP expected that Zoetrope would be a portable device to be used for Event viewing. The prototype was ambiguous enough that consumers expected that Zoetrope provide an installed TV replacement. The implication is **not** that HP needed to provide that TV replacement but that HP had to select a quadrant to target, and make a consistent set of decisions (about design, pricing, features, etc.) to deliver a product specifically for that quadrant. If not, the product would be confusing, frustrating, and ultimately disappointing.

### C. Results

Shortly after completion of this research, HP decided not to pursue further development of Zoetrope. After a number of months that decision was reviewed and the product group resumed their work. In addition, we revisited the research to understand implications for the projection TV category. In November 2004, HP began shipping the ep9010 Instant Cinema Projector.



**Figure 6.** Hewlett-Packard ep9010 Instant Cinema Projector

In April 2005 HP announced a new line of Pavilion TV sets (LCD, plasma, and rear-projection).

### References

- [1] Goffman E. *The Presentation of Self in Everyday Life*. New York: Doubleday, 1956.

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