

# SYSTEMATIC ANALYSIS METHODS FOR RESEARCH OPENING THE MYSTERIOUS BLACK BOX

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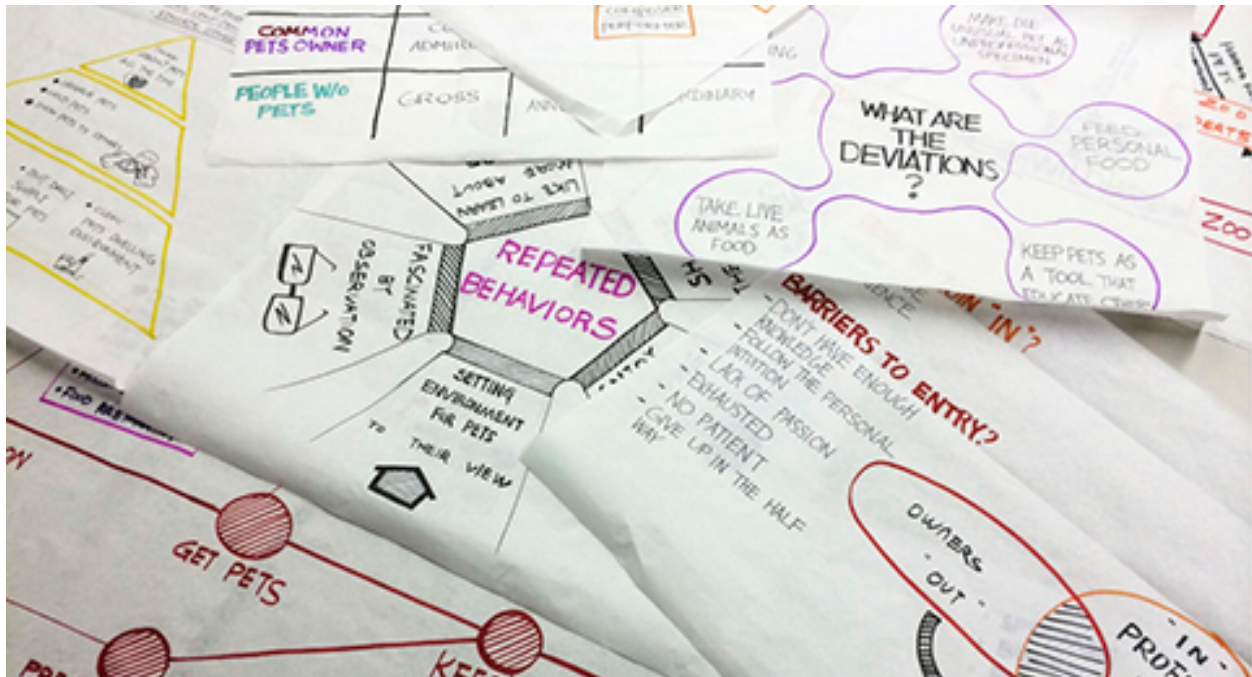


Figure 1. Students use a variety of analysis frameworks to derive insights from the research findings. (Image from Exotic Pet Culture research by undergrad Product Design students Jocelyn Ma, Susan Zhang and Siwei Wang. Photo by Jocelyn Ma, 2014, 2014.)

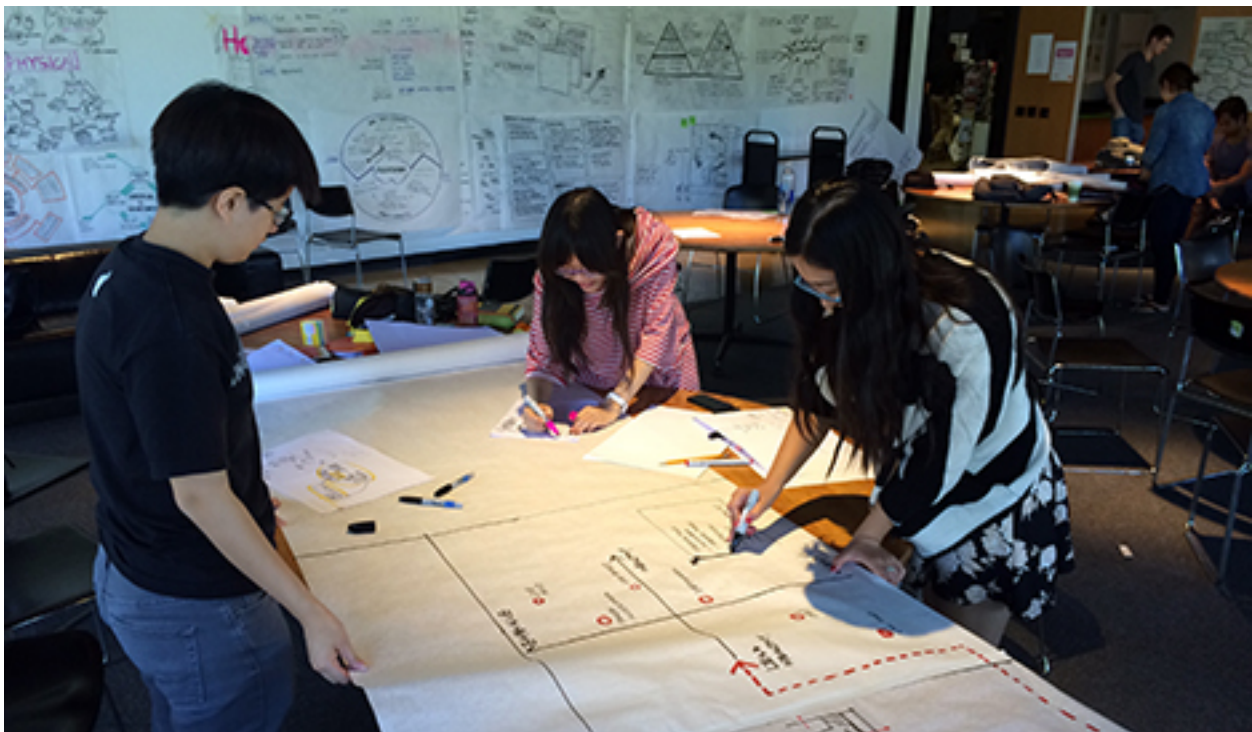
Qualitative research fieldwork produces clouds of data. We must ensure that no idea is lost and that comprehensive understanding is produced. While much has been written of research methods and even individual analysis techniques, not much has been written about systematic methods of analysis. At the EPIC 2009 conference John Payne conducted a workshop to develop an “analysis/synthesis palette” based on work done by Steve Baty. At the time, Payne described how most researchers talk about analysis, saying that we describe the framing and methods for the fieldwork, and follow that with something like, “and then the magic happens,” as if the analysis happens shrouded in mystery inside a “black box.” To practitioners, students, and especially our clients, a better explanation of the process could be provided. (Payne 2009) Payne’s work opened up the black box and provided a thorough and exhaustive process that would serve practitioners well (and would make sense to clients), but its sixteen discrete operations might be too in-depth for students, especially undergraduates, especially in a research process within a short time frame.

Over the years we’ve taught a dedicated research course for undergraduates and graduate students, we saw that a methodological system for conducting analysis was called for. Early on, we adopted the KJ Method. Pioneered by Jiro Kawakita in the 1960s and sometimes called an Affinity Diagram or more informally, a clustering exercise, the resulting wall of Post-It notes is now an iconic symbol of the design

thinking process. (Kawakita 1975) We employed a variant used by Herman Miller research specialist Waltraud Beckman, and found it useful to make sense of the undifferentiated cloud of research findings from a half term of fieldwork. Students would attempt to derive conclusions from this exercise, but these were more often than not thin and obvious. After a few terms of final presentations ending in a slide with three bullet points, all of which were known to us before the research had begun, it was clear that we needed a way to dive into the data on the wall of Post-Its and derive more robust and original conclusions.

One problem with conducting research projects in a design program stems from the lack of a variety of viewpoints on the research team. Though students might come from different backgrounds, they see the data primarily through the eyes of industrial designers. In professional practice a research team comprises a variety of specialties in addition to design—anthropology, sociology, cognitive psychology, marketing, and others related to the project at hand. Might we employ a set of “filters” through which to view the data, as if we had this variety of specialists standing beside us helping us to see differently?

We have developed a deck of analytical frameworks allowing students to look at the data through different lenses representing this variety of mindsets. Some have been inspired by analysis methods used by other educators and practitioners, and some are the work of ArtCenter faculty. The exercises are done in a specific order, starting with a first pass through the component ingredients found in the field of study and ending with an exercise that summarizes generally, and then more specifically, concluding with insights that provide viable design opportunities. Key to the production of understanding is the technique of asking the students to work with the information in a diagrammatic fashion.



## THE ANALYSIS DECK

Figure 2. The act of diagramming the answers to the questions in the analysis deck is itself a key to understanding the findings. (Photo: Anastasia Hanan, 2014)

### DIAGRAMMING THE UNDERSTANDING

The deck is a series of cards containing questions—each set looks at the data from a different viewpoint. The students are asked to provide the answers in the form of diagrams. Rather than simply listing the answers, they must think about the knowledge and ask themselves what type of diagram would best enable understanding. This requires effort. We are not asking for “pretty pictures” of information; we are asking students to show us what the information *means*. The act of thinking about how to represent the data is a key to unlocking insights. We understand that creating effective diagrams is a task that daunts even professionals, so we refer the students to Chapter 3 of Duarte’s *Slide:ology*, which has a good breakdown of types of diagrams and how to use them. (Duarte 2008)

The operating principle behind this process is that, by viewing the research findings from different points of view and by passing over the same territory more than once in a different way, non-obvious insights that are based on tacit, latent, and otherwise under-the-surface knowledge will emerge.

### EXERCISE 1: THE P.E.A.O.S.I.M.

This is a combination of Kumar and Whitney’s POEMS framework and the AEIOU developed at the Doblin Group. (Kumar and Whitney 2007; Robinson 2015) These were employed in coding (attaching thematic tags to segments of) research videos. POEMS stands for people, objects, environments, messages and systems/services. AEIOU comprises activities, environments, interactions, objects and users. There is overlap between the two. POEMS contains all the elements of AEIOU but activities and interactions. We could have called this exercise POEMS+AI, but our experience has shown that putting the elements in logical order helps the students build a better understanding. We favor this logic over the beauty of a simpler acronym, so the components in their final order are: people, environments, activities, objects, systems/services, interactions, and messages.

This exercise arrays all of the elements uncovered in the research fieldwork into a categorization that will be useful in upcoming exercises.

### EXERCISE 2: THE USER EXPERIENCE FRAMEWORK

Also from Kumar, this is a useful breakdown of human factors into five types: physical, cognitive, social, cultural and emotional. (Kumar and Whitney 2007) Students are accustomed to anthropometrics, but might not think to examine the other aspects of human experience. This provides a checklist to ensure that they see the complete picture.

### EXERCISES 3 AND 4: THE ETHNOGRAPHER’S POINT OF VIEW

Two cards in the deck ask questions an anthropologist might ask. The first set is based on questions asked by Elizabeth Tunstall of her students at the University of Chicago. (Tunstall 2007) This provides a useful framework for looking at the findings from this point of view:

- What does [your topic] mean to [your participants]?

- What are the repeated behaviors? Are there any patterns?
- What are the deviations, and what does it mean to deviate?
- What do the rituals mean in terms of individual and group identity?
- What are the roles of participants and non-participants?
- What sense of order is provided for [the participants]?

The sequence of these questions leads the students through a process of understanding overall meaning, rituals and how they might function for the individuals involved, and finally the sense of order provided, which is related to the primal human aversion to entropy.

The second exercise asks the following questions that any ethnography would answer:

- Is there a hierarchy? What is it? Who is at the top? Who is at the bottom? How can you tell?
- Who is in the “in group?” Who is out? How do you know?
- How do you join the “in” crowd? Is there a rite of passage? Are there barriers to entry? What are they?

### **EXERCISE 5: BOURDIEU’S FRAMEWORK**

Pierre Bourdieu’s four forms of capital provide an interesting opportunity to view aspects of power in the research project’s field of study. (Bourdieu 2002) The four forms represent not only money, but also other assets in play. This exercise provides a means of checking that all have been investigated, this time from the point of view of sociology.

- **Economic Capital:** The amount of money needed to secure financial survival. Value gained when we act in our own self-interest.
- **Symbolic Capital:** Prestige, honor and attention. This is a crucial source of power, evidenced by gait, dress and accent, for example.
- **Social Capital:** Expected collective or economic benefits derived from preferential treatment and cooperation between individuals and groups. This embodies the idea that social networks have value, especially the value gained by performing “good deeds.”
- **Cultural Capital:** Competencies, skills, qualifications and education—social aspects that promote social mobility beyond economic means.

We ask students to consider how each form of capital is represented, who is powerful, who is not and why, whether there are different levels within each form and what those levels are, and finally, which types of power are considered legitimate, and by whom.

	economic	social	symbolic	cultural
how this form of capital is represented				
who is powerful? who is not? why?				
different levels? what are they?				
legit, or not?				

Figure 3. We use this matrix as a starting point for a diagram, but students are free to redesign it if they see reason to do so.

**EXERCISE 6: USER EXPERIENCE JOURNEY MAP**

This is a popular way to diagram the touchpoints of user experience in one comprehensive chart. Using this method late in the analysis allows students to put together many of the findings studied in earlier exercises in a way that generates additional insights.

This is a time line with the touchpoints of user experience arrayed along the horizontal axis. The vertical axis contains important facets of the experience—most common are what people are doing, thinking and feeling at each touchpoint. Depending on the project, we might add devices or objects used, channels of communication, and context.

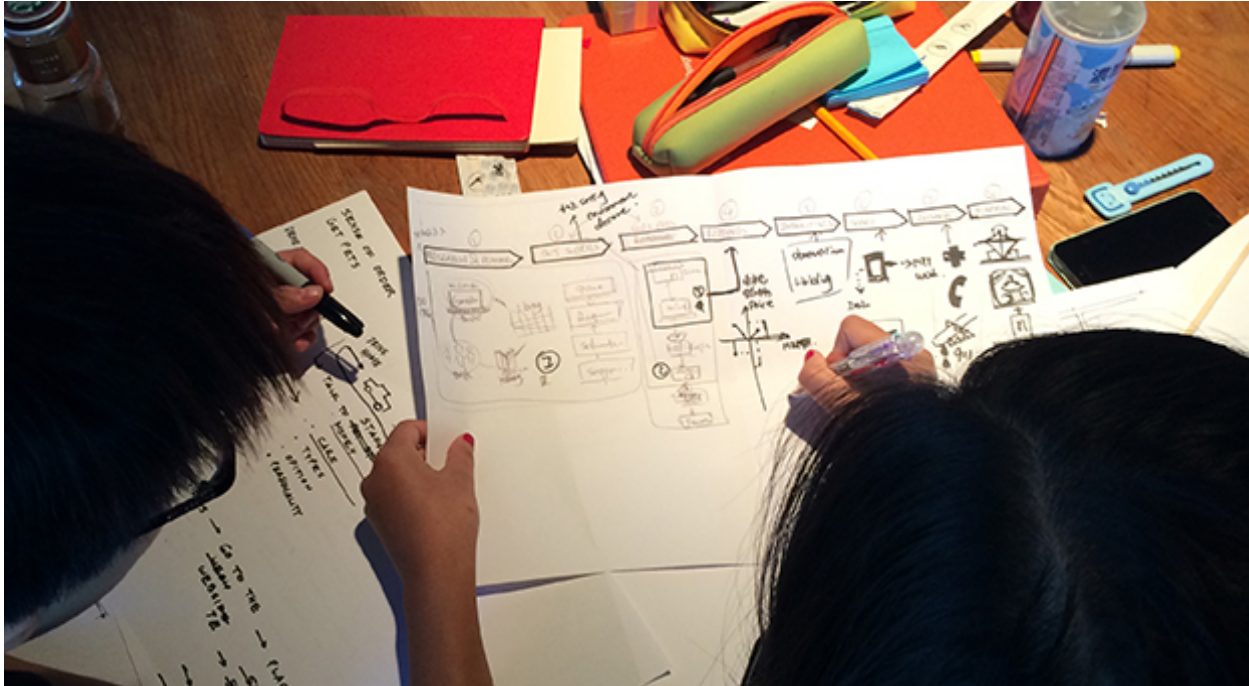


Figure 4. We suggest that students sketch the User Experience Journey Map first, to arrive at the layout that best reveals understanding (Photo: Anastasia Hanan, 2014).

### **EXERCISE 7: THE P.N.S.T.I.O.**

This is an adaptation of the POINTS / TISI framework used by Engine Service Design in the UK. According to Engine, the acronym stands for problems, opportunities, insights, needs, themes and system challenges, followed by themes, issues and “so what?” which is used to expand themes that originate from the first part of the exercise. (Engine Service Design n.d.)

As with the POEMS and AEIOU frameworks in Exercise 1, we feel that the elements need to be re-ordered and simplified to form a logical progression. The revised version—problems, needs, system challenges, themes, insights and opportunities—provides a logical road map from specific to general, and from past (the research) to future (the upcoming design project). This allows students to summarize what they’ve learned and conclude with insights that lead to viable design opportunities—the end goal of the research. We ask students to generate as many insights as possible and from those insights list as many opportunities as they can generate. They refine this list to the few best—we suggest about ten, in as wide a range as possible. These form the fuel for the ideation phase that follows the research. We suggest ten so that a large number of concepts can be generated. Creating ten concepts from each opportunity will yield 100 concepts.

In the research presentation, each opportunity is presented in a way that connects it to the insight that led to it. We call these “insight / opportunity pairs.” We advise that throughout the design process, the idea should always be presented in a way that connects it to the insight that produced it. This helps the product development team to remain focused on the original vision for the project—to remember the knowledge gained from the research that forms the foundation of the idea.

## FINAL THOUGHTS

Throughout this process, brainstorming rules apply. All members of the team must work as a group, all members have an equal voice, all ideas should be recorded, and when in doubt, accept the idea. Each team defines the rules and definition of terms for each of the exercises relative to their project.

We spend the same amount of time in analysis as we do in fieldwork. In the case of our capstone research-only courses, this is five weeks for each. The exercises are done in the studio and between class meetings as homework.

The exercises themselves are important, but the order and sequence builds one set of understanding upon another. The act of making the diagrams is difficult, but important. Understanding comes from the struggle to show the information to communicate meaning.

Students no longer conclude their research presentations with three uninspired and obvious bullet points. They typically generate six to ten novel, varied and viable design opportunities that can fuel a robust ideation phase.

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