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Communicating Design Research Effectively

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Communicating Design Research Effectively

by

Celeste Nicole Roschuni

A dissertation submitted in partial satisfaction of the requirements for the degree of
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in

Mechanical Engineering
and the Designated Emphasis

in

New Media

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Alice M. Agogino, Chair
Professor Sara L. Beckman
Professor Paul K. Wright

Fall 2012
Abstract

Communicating Design Research Effectively

by

Celeste Nicole Roschuni

Doctor of Philosophy in Mechanical Engineering

with a Designated Emphasis in New Media

University of California, Berkeley

Professor Alice M. Agogino, Chair

Human-centered design has emerged as an important strategy in product and service design and development, as it has become recognized that understanding user needs is critical to product success. That understanding typically emerges through design research: the systematic study of the attitudes, behaviors, and desires of potential users and customers. The impact of design research depends on its visibility and credibility to decision-makers. However, challenges to this visibility and credibility present themselves when there are organizational separations between those conducting the research and those involved in the product development. A specific team or company may conduct design research, and then pass the results of that process to another team of industrial designers or engineers. Since the second team often neither conducts research activities nor participates in data analysis, they may not necessarily be aware of the research nor feel responsible to it. For that reason, the impact of design research in distributed human-centered design processes depends not only on how well researchers communicate the findings to other stakeholders in the design process, but also on how well they are able to convince those stakeholders of the relevance and importance of the research findings.

This work draws on a tradition of treating design as a social process where dialogue and argumentation enable stakeholders from different disciplines to collaboratively assemble a coherent and believable story about the product and the context of its use. In-situ interviews, workplace tours, and case studies drawing on the experiences of fifteen expert design researchers and four design engineers were used to investigate the processes by which design research is propagated to other design stakeholders, and used to explore whether persuasive and motivational principles are used in this process.

The analysis of communication strategies employed by expert design researchers suggests approaching design research communication as a design problem, one amenable to the philosophies and skills of human-centered design. The researchers in this study used the tools and methods of human-centered design in a similar and parallel design process, treating designers and other stakeholders of the design process as users of design research. Applying
the findings of a double ethnography, design researchers iteratively design and test their communication pieces to create actionable research deliverables. To increase the impact of their research, they work to socialize the research throughout the design organization, and to foster a sense of ownership among the members of that organization.

Design researchers also apply Principles of Persuasion and Motivation to Learn to increase the likelihood that their research is credible and inspiring. They focus on presenting relevant evidence while challenging their audience in ways that are novel and lead to immediately apparent positive outcomes. Tactics for accomplishing this are identified through a set of case studies examining successful design research communication events at leading design research companies. Metrics for assessing the successful impact of design research are also proposed. An interactive web portal to facilitate the capture, analysis and widespread use of design methods, *TheDesignExchange*, is proposed as a platform for the collection and evaluation of human-centered design research and communication methods.
For my grandparents, especially Grandpa Bob.
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Chapter 1

Introduction

In the late 1990s, new plastic bottles were displacing aluminum cans as the packaging of choice for convenience beverages. Alcoa, a company that produces the material to make 100 billion aluminum cans per year, hired research firm Point Forward to investigate the role of beverage packaging in shopping, storage, preparation, and consumption. After studying 28 families in four U.S. cities, Point Forward found a post-purchase barrier to consumption: although people were buying cases of beverages, if the cans did not get into the refrigerator, they would not be consumed. How consumers think about the “real estate” of their refrigerators – that the back is a “dead zone”, and long and deep items are considered the most space efficient – led to fewer refrigerated cans, and thus to less consumption. In response, Point Forward worked with Alcoa and secondary packaging company Graphics Packaging to come up with the dispensing multipack, “FridgePack”, shown in Figure 1.1. They then had to convince Coca-Cola to actually use it, a separate challenge all together.

Point Forward had strong evidence that customers were not drinking as much Coca-Cola as they might otherwise because it wasn’t already cold when they wanted it. Further, it knew that customers were reluctant to give up more valuable space at the front of the fridge for more sodas. However, Coca-Cola had never seen an increase in sales due to a change in packaging, and they did not believe it was possible. Despite the strength of its evidence regarding customer consumption patterns, Point Forward was unable to convince Coca-Cola USA of the need for a new packaging solution, which rejected the FridgePack concept outright.

It turned out that one of the people at Alcoa knew someone at Coca-Cola Australia, and leveraged his contact to pitch the idea a second time. Coca-Cola Australia then agreed to take a chance and test run the concept, using the name “Fridgemate.” The test resulted in a significant bump in sales after only two months, which Coca-Cola USA noticed and decided to adopt the concept after all. FridgePack has since gone on to be highly successful.

Why did the pitch to Coca-Cola Australia result in success, when the pitch to Coca-Cola USA failed? Over the past forty years, it has become recognized that understanding user needs is critical to product success (e.g., [56], [96]), and yet Coca-Cola USA rejected a concept that was based on the needs and preferences of its customers. This thesis investigates what
makes the difference between rejection and successful adoption of research and research-based concepts.

1.1 Human-Centered Design

Point Forward, and companies like it, follow an approach to innovation called Human-Centered Design (HCD) in which an understanding of potential users drives decision-making through the use of design research: the systematic study of the attitudes, behaviors, and desires of potential users and customers. In contrast to approaches such as technology push, in which designers begin with a technology and then find applications for it (Martin, 1994), in human-centered design, research insights generated through design research, such as those shown in Figure 1.2, provide a critical foundation for every subsequent step of the design process. The focus on the needs of the end customer or user provides “guidance during the design process and criteria for judging the success or failure” of the final design.

---

1 Whether “design research” is the best term is up for debate: others refer to similar activities as “user research,” “applied ethnography,” “design anthropology,” “customer experience research,” “consumer insights research” and many others. At the same time, design research can refer to research on design, research through design and research for design. And in fact, can mean research on technology for design or, the sense meant here, research on people for design. Nevertheless, this thesis uses the term “design research” to refer to the systematic study of customers and users.
Context Need: To help the family through the grieving process

Morticians adopt the frame that the deceased is in some way still human in order to develop a relationship of trust with the family they are working with.

“Sometimes I talk to the people I’m working on. It’s like ‘I hope you like your manicure’, because it helps me feel like I’m really their caretaker.”

NEEDS

- To prepare the bodies to meet the expectations of the family
- To maintain an appropriate atmosphere
- To empathize with survivors
- To be formal/professional
- To remove uncertainty from the process
- To adjust demeanor according to the family

Morticians establish a transition to grief by giving the survivors a period of time when the loved one seems both alive and dead by making them look alive.

“I think people are able to really start grieving once the funeral arrangements have been completed and they know their loved ones have achieved spiritual passage.”

Figure 1.2: An example research insights
CHAPTER 1. INTRODUCTION

Maintaining Research Intent

Design research is successful when the results of the research activities influence the company, its products, or the way it interacts with its customers \[87\]. This successful state can be described as the maintenance of research intent. Research intent corresponds to the common notion of design intent \[69\], where the underlying purpose of previous decisions must be maintained in preference to the individual decisions themselves. Maintenance of research intent during engineering and design processes connects that purpose back to users’ perceptions, wants, and needs. Those who participate in conducting design research connect to the research intent best \[26\], so having the same people conduct the research then generate and develop product concepts is the easiest way to maintain research intent throughout the process. This situation is how design is commonly taught in college design courses, but is less common in industry settings. However, the research team is not always the same group of people that will use the research insights to create new products and designs. In fact, with the specialization of different roles, the multidisciplinary design team may have many different forms, modeled in Figure 1.3. By conveying the research intent through these different configurations, design researchers are trying to create design rationales that can be successfully used throughout an organization to address questions about users’ perceptions, wants, and needs with the idea that the answers will help put previous decisions in perspective for the current project.

The expanding practice of HCD has resulted in professional specialization, resulting in a division between dedicated “design researchers,” whose jobs largely involve studying end users, and designers who see research as part of their design process \[122\]. Outside of the classroom, this latter group (Figure 1.3(a)) is most commonly found in the User Experience field, where designers will research potential users and then create user interface concepts based on that research. Some User Experience designers will even do the coding and software development themselves.

In the development of physical products, it is more common to have multidisciplinary teams made up of specialists that work together throughout the design process, each taking a larger role depending on the task at hand (Figure 1.3(b)). This configuration is common in design consultancies such as Smart Design or IDEO.

However, sometimes a company will have its own internal design teams. In these cases, they may hire outside research firms, like Point Forward, to conduct and report on the research to their internal groups, leading to a separation of the teams, represented by Figure 1.3(c). Some larger organizations that have dedicated design research groups, such as BMW or Salesforce, have set up these groups as internal consultancies. Though they are in the same organization, they only work as a team on a project basis, much as the external design consultancies.

In the most extreme circumstances, the research and design teams will not interact directly at all (Figure 1.3(d)). For example, a company may first hire Point Forward to investigate market segmentation and strategy, and then later hire Smart Design to develop a product based on that research, first receiving insights from Point Forward and then passing
them on to Smart Design.

As the research and design teams become less integrated, or more segmented, the communication skills of the researchers become more important in maintaining the research intent, and in increasing the impact of the research insights on design decisions.

**Communication of research intent**

As a consultant on a design project, design researchers collect and synthesize data on the state of the target market. Just as for any consultant, the success of their work is based not only on getting good insights, but also on how well they are able to convince those who make the design and project decisions to use those insights to influence the design direction. In addition to the quality of the design research in developing a deep understanding of the end users, three other components come into play:

1. Identifying and understanding the designers and decision makers.
2. The motivation of the audience to consider the insights.
3. The ability of the audience to integrate the insights into their knowledge base and work.

Designers and others on the receiving end of design research communication may be resistant to using the information because they don’t see the results as credible or trustworthy. In addition, a lot of data from design research is “tacit” – i.e., it must be learned through experience [106] – making it difficult to transfer to others. Howard and Mortensen suggest solving this issue by avoiding it. Instead of acting as interpreters between the lives of ordinary people and the companies that serve them, they suggest design researchers reframe their role within business to being guides who take everyone in the company out into the field to meet users and customers, essentially adding the entire company to the research team [73]. Though this might get around the problem, in most cases it is logistically and financially impractical, leaving the researchers with the challenge of communicating what they’ve learned in the field to other stakeholders in the design process. For that reason, skillful research communication requires more than clear writing or informative visual representations, or even adept speaking, gesturing, and listening. It also demands the ability to connect a narrative to the needs and questions of the audience [8].

However, researchers often find they have diverse audiences. For the purposes of this analysis, the audience for design research is divided into two groups: the immediate research clients and the secondary research stakeholders. In this case, research clients are those people acting as representatives of groups or organizations, which commissioned the research. Research stakeholders are those people or groups who are not directly responsible for commissioning the research but who have an influence on design decisions and might find the results interesting, useful, or troublesome.

1.2 Research Questions

This thesis aims to contribute to answering the question, “how can design researchers increase the impact of their work on the design process?” In particular, it addresses the following questions:

1. Given the fact that the communication of design research and the maintenance of research intent has a large effect on the success of new products, how is this communication task represented across design process models?

2. How do design researchers identify and understand the designers and decision makers who will carry out the later stages of the design process?

3. What persuasive and motivational tactics do design researchers use in their communication process?

4. How can design researchers better inspire and engage designers?
There are three main areas of previous work that have informed the development of these research questions: a) the development of novel deliverable formats b) research into the processes of sharing research within an integrated team c) discussion of the communication of research across teams. These are summarized here to help justify the focus of the work presented in this thesis.

The first focuses on developing novel formats for design research deliverables. Researchers have come up with many ways to communicate their insights. These include paper and digital reports [55]; presentations [146]; storyboards [62]; roleplaying [133]; and custom designed artifacts, such as card decks and posters [73], among others. The discussion of the design of research deliverables is postponed until Chapter 6.

The second looks at the communication of research data and insights within an integrated team in order to create a shared understanding between team members about the implications of the research. This literature treats design as a social activity, characterized by information exchange, compromise and negotiation (e.g., [21]). Within this context, Hey, et al., looked specifically at how a team develops a shared understanding through the four stage framing cycle shown in Figure 1.4 [70]. The summary of the cycle is that individuals start with a broad understanding (or framing) of the problem, and through research and design activities individual assumptions are revealed and a common frame is negotiated. This process is repeated throughout the research and design phase, redefining the shared frame as more assumptions, or hidden frames, are revealed.

Oehlberg, Roschuni and Agogino [107] looked at the process by which individual information is revealed in process of capturing, reflecting, and sharing. They proposed that after the
Figure 1.5: Sharing cycle, reprinted with permission

capture of design research data or the development of conceptual designs, information is first reflected upon by individual team members, then shared within the team, which then goes through Hey, et al.’s framing cycle. Once the design team members have negotiated a shared understanding, however, they then share “as a team” with people or groups outside of the design team. This indicates that another framing cycle must commence between the team and thee outside people or groups. Oehlberg, et al., note that as information is “captured, reflected upon, and shared, its formality gradually increases as structure is imposed through synthesis and decision-making” [107].

The third area of previous work addresses the communication of design research data between design researchers and other stakeholders in the design process. This work is primarily an ongoing discussion among the applied anthropology community, in which each contribution addresses a small aspect of the design research process through the analysis of a personal case study. This thesis builds off this discussion by taking a broader look at design research communication practices across multiple practitioners.

Included in this third area is work by Visser [145], who examined the process of representing the everyday life of customers in co-design processes. She proposed mechanisms for enhancing empathy, supporting engagement, and providing inspiration to design teams, including: interpretation, imagination, connection, immersion, personification, interactivity, motivation, ownership, curiosity, and sensitization. To support these mechanisms, she suggests sensitizing designers, making communication participatory, stimulating designers to
address their own experiences, and making a good communication plan based on a representation of “real individual people”. Though Visser defines these mechanisms through a series of case studies she was directly involved in, she does not examine why they are effective, which makes it difficult to determine when and how to use them.

1.3 Thesis overview

This thesis expands on the previous work by looking at the factors that make mechanisms such as those identified by Visser effective, and drawing together experiences and insights from multiple design researchers through interviews, workplace observations, questionnaires and case studies. It addresses activities and techniques for generating artifacts and deliverables for communicating design research results, rather than addressing the generation of the research itself. In particular, it address activities which allow researchers to better convey meaning and inspire action in a persuasive and inspiring way by first understanding the expectations, viewpoints, and past experiences of their audience. It draws on an understanding that the development of the product story helps create a shared understanding between the different members of the team on what they are developing, and on the process they will follow [137].

Chapter 2: Design Process and Communication looks in-depth at design process models, and identifies common activities between processes and domains. A general process model is developed, and the role of communication in design as represented in design process models is examined. It is found that communication intended to influence design, rather than report design, is implied in less than 27% of the 71 process models examined, and explicitly represented in only 1%.

Chapter 3: Communication, Persuasion and Motivation to Learn reviews literature on communication, persuasion, and motivation to learn to build up an understanding of some of the mechanisms at work in influencing design decisions. Issues in communication are explored, and Principles of Persuasion and Motivation to Learn are developed.

Chapter 4: Understanding and Engaging Designers examines how design researchers work to learn about their design and management team clients – both how they identify who they need to persuade, and what viewpoints they need to influence. The analysis finds that design researchers use a double ethnographic approach to learn about their clients and then use three tactics for disseminating the research insights: socialization of the research, fostering a sense of ownership over the research, and crafting actionable deliverables.

Chapter 5: Persuading and Motivating Designers examines the role of Persuasion and Motivation to Learn Principles, identified in Chapter 3, in communicating design research insights. The Principles that increase the effectiveness of socialization, ownership and actionability are identified.
Chapter 6: [Actionable Research Deliverables] explores techniques for making design research deliverables insightful, engaging and inspiring through an in-depth examination of case studies of actionable communication from Kaiser Permanente, Point Forward and Intel’s Genevieve Bell. Common techniques are found to include analogies, quotes, guidance, polish, surprise, and novelty.

Chapter 7: [Summary, Recommendations and Future Work] summarizes the findings of the other chapters, and integrates them into the design process model developed in Chapter 2 as a mini-HCD process aimed at the design of actionable deliverables. It concludes with a look at open questions that build off the work presented in this dissertation.
Chapter 2

Design Process and Communication

“Design” is an ambiguous term. The Oxford English Dictionary defines it as “a preliminary drawing or sketch”, “the process, practice, or art of devising, planning, or constructing something”, “the completed product or result of this process”, and “a decorative pattern” [108]. The domain of design is claimed by many disciplines – from art, to architecture, to engineering. While each may be fundamentally different in what they produce, there are arguably very interesting similarities among the different approaches they take, as well as subtle but important differences.

The goal of the study of design and the design process, or design methodology, is to increase the understanding of how designers work and think; to establish appropriate structures for the design process; to develop new design methods, techniques, and procedures; and to reflect on the nature and extent of design knowledge and its application to design problems [36]. Observing their own processes and those of the people around them, many people have published “design processes”, but a single dominant model has not emerged.

This chapter analyzes a number of these design processes in order to explore the role of communication in design. The first section begins with an overview of the history of the design process model, and explores some of the ways design models have been categorized. A collection of process models are then analyzed to identify a common set of design activities, which can be used to describe various process models. The chapter ends with a discussion of the role of communication within the design process contrasted with its representation in the models analyzed.

2.1 Design Process Models

The earliest process models that could be said to pertain to design, focused on generic creativity or problem solving. They emerged in the early part of the 20th Century, and used generic terms such as “incubation” and “illumination” [147] or “Plan, Do, Check, Act” [129]. The concept of a “design method” originated at a 1962 conference called “The Conference on Systematic and Intuitive Methods in Engineering, Industrial Design, Architecture and
Communications” [76]. This event focused on concerns about how the modern industrialized world was being manifested. Conference participants stressed that designers need to work in cross-disciplinary teams where each participant brings his/her specific body of skills, language and experiences to defining and solving problems in whatever context [76]. Since then, the study of the design method has extended to the overall design process.

Just as the definition of design has evolved over time, so have descriptions of the design process. Asimow [5], based on observation of engineering processes, simply defined the design process as one of analysis, synthesis and evaluation, but asserted, “its process resembles that of problem-solving in general.” Herbert Simon broadened the view of the design process to address general problem solving [132]. Alexander [1] saw design as entailing “finding the right physical components of a physical structure” and thus defined it as a process of decomposition of a problem into its elemental parts. Each presented various depictions of the stages of the design process.

In practice, there are many different embodiments of the design process. Ulrich and Eppinger’s [143] textbook, for example, details the stages that a typical new product development team goes through to design and develop a product (Figure 2.1). The relatively new agile approach to software development builds on early work by Barry Boehm [14], which depicts the process as much more iterative than the traditional linear or waterfall models. Boehm’s original spiral model of design is shown in Figure 2.2.

The genesis of many models used today to describe the design process appears to be work by Charles Owen [109] at the Illinois Institute of Design who put forth the model in Figure 2.3 that views design as a process of knowledge development. Charles Owen describes the design process as having “recognizable phases, and these, while not always in the same order, nearly always begin with analytic phases of search and understanding, and end with synthetic phases of experimentation and invention” [109]. Beckman and Barry [7] integrated Owen’s work with work on learning and learning styles [84] to create a model of the design process (Figure 2.4) that is grounded in the learning literature. With the proliferation of design process models, researchers have begun to develop categorization schemes to help make sense of them.

**Categorizing design process models**

A simple way to categorize design process models is based on whether they attempt to describe the processes designers actually use through an investigation into design practice
in industry, or to prescribe a set of “best practices” intended to improve the effectiveness or efficiency of the design project. However, this categorization scheme is muddled by the fact that many design processes attempt to do both.

Blessing proposed a categorization of design process models based on whether the models focus on stages, activities, or a combination of the two. Blessing builds on work by Hall, who proposed laying the stages of design (e.g., conceptual design, detail design,
et al.) orthogonally to the iterative problem-solving process that takes place within each of those stages (e.g., collecting information, analyzing and synthesizing, etc.). Blessing proposes four categories: stage-gate models such as the one by Ulrich and Eppinger (Figure 2.1) [143]; activity-based models such as the one by Barry and Beckman (Figure 2.4) [7]; models that combine stage-gates and activities, such as the one by Asimow [5]; and models that combine activities and stage-gates with an indication of convergence between iterations, such as Boehm’s spiral model (Figure 2.2) [14].

Another scheme divides processes into either solution-oriented or problem-oriented categories (e.g., [94, 88]). Solution-oriented models start with a proposed solution, and then repeatedly modify it as the design space and requirements are explored. Problem-oriented models analyze the problem in depth before generating a set of possible solutions. Though Lawson found that the strategy actually chosen was based on background and training [88], Dorst and Cross looked at how designers displayed the “creative event” of design in process models and found that defining the problem is a key aspect of creativity – each designer interprets assignments differently, but all saw a redefine of the problem as a creative moment [40]. They also found that available resources drove many design decisions – e.g., not enough time will lead to simplifying the process. Building on the work of Maher, et al. [95], Dorst and Cross confirmed the co-evolution between problem space and solution space, and observed that the surprising parts of a problem or solution are what drive the originality of the solution. This suggests the need of a unification of the problem- and solution-oriented approaches [59], with the possibility of multiple points of entry [88].

Wynn and Clarkson divide models into whether they are abstract, procedural, or analytical [151]. They describe abstract models as those which describe the design process at a high level of abstraction – the Barry Beckman model is again a good example. Procedural models are those which are more concrete in the activities and order prescribed, such as Boehm’s model. Analytical models are those which describe particular instances of a design project – essentially what other people might consider a “design method”, such as particu-
lar analytical tools like the design structure matrix (DSM) [136]. They argue that abstract models, such as the exploration-generation-evaluation-communication model by Cross [37], are not as useful as procedural models in guiding the designer through the design process, because they obscure much of the work and iteration involved in actual designing. However, they obscure the boundary between design process model and design method.

In the specific case of Human-Centered Design, Sanders (2008) modeled approaches to research and design practice along two different dimensions: design-led vs. research-led approaches and expert vs. participatory mindsets. The approach may be guided more by the professional concerns of designers, or by the professional concerns of researchers. The mindset behind the process, on the other hand, may give the designer primary control as the expert, or include the user as a partner, as is practiced in Participatory Design [126].

One last useful way to categorize design process models is whether they focus on the design task or on the execution of the project [151, 93]. Design-focused models describe the steps necessary to progress from problem to solution, while project-focused models attempt to map the context of the design process, including activities such as product planning, marketing, and manufacturing. An example of a project-focused model was developed by the Project Management Institute [44], shown in Figure 2.5. MacMillan, et al., and Maffin argue that both design and project tasks need to be considered in the design process, and that researchers should consider models which are more sympathetic to the design context and needs of design practitioners [93, 94].

Lawson argues, that as there is no single process model that sufficiently describes the design process, it makes sense instead to discuss “design approaches” [88].

2.2 Methodology

Based on a literature study across disciplines including Interdisciplinary Design, General Creativity/Problem Solving, Software, Business, Liberal Arts, Engineering, and Architecture, 71 design process models were examined for commonalities and differences. Rather than develop a new model of the design process, the goal of this analysis is to develop a set of common design activities, and patterns of activities which could serve as the basis for guidelines on customizing a set of design activities for a particular project. In the course of the analysis, it became apparent that there is a set of less commonly addressed, but still important, activities in design.

The review of models is broken into two main stages. The first was focused on breaking apart the design process models into their basic activities and building up a set of “common activities” which may be used to describe all design process models. In the second stage, the role of communication represented in the design process models is analyzed.
**Sources of design process models**

The initial collection of design process models was based off of those reviewed in Hugh Dubberly’s compendium of design models, “How do you design?” [43]. This provided a corpus of models to compare across several disciplines, both from academic and practicing sources. All of the models in this collection had a diagram illustrating the main activities, steps or stages of a design process. Most of the development of the common set of design activities was based on the models in this collection. During the course of the study, 10 additional models not included in the Dubberly compendium were collected through a review of additional literature. These models were included in the second stage of the study to increase the number of models representing each discipline, and to test conclusions drawn from the analysis of the first set.
Interdisciplinary Product Design 12 process models
General Creativity/Problem Solving 5 process models
Software/web design 18 process models
Business 10 process models
Liberal Arts (social science, math) 4 process models
Engineering 13 process models
Architecture 9 process models

Table 2.1: Process models by discipline

The design processes reviewed ranged from simplified abstract models, to elaborately
detailed procedural models; some were published by design firms in an effort to differentiate
themselves from their competitors, others were developed in order to teach design to novices.
Some built on others that were also included in the analysis. In total, the analysis included
71 design processes. The breakdown of process models by discipline is shown in Table 2.1.

Team Composition

The research team in this study consisted of one faculty member from the Haas School of
Business with a background in Industrial Engineering and Statistics, one graduate student
from the Department of Mechanical Engineering, and two Undergraduate researchers - one
from Industrial Engineering and Operations Research and one from Undergraduate Business Studies. The multidisciplinary nature of the team helped to spur a discussion on the
different ways disciplines view and implement design activities. As this thesis focuses on
communication of design research, the task of determining whether the final set of activities
developed are intuitively descriptive across disciplines is left as a separate endeavor.

2.3 Analysis: Determining a common set of design
activities

Each design process model was first categorized into its dominant discipline. Academic
sources were categorized based primarily on the domain from which the model had been
developed. For example, models developed by Nigel Cross focused on the engineering design
process (e.g., those from Engineering Design Methods \[37\]), and were categorized as such
even though Cross has a background in Industrial Design and Architecture. Those that
attempted to map the “general” design process were placed in “interdisciplinary design” .
Models developed by practitioners, such as those by IDEO or StudioH, were categorized based
on the main activities of the firm (e.g., Interdisciplinary Design for IDEO, and Architecture
for StudioH), or in some cases, by the specific practice the model was meant to address
(e.g., there were two developed by the company Factor Design, one for business development
CHAPTER 2. DESIGN PROCESS AND COMMUNICATION

and one for web design). Some models were meant to address general creativity or problem solving, and were placed in an independent category.

For each design process model, we then recorded the following attributes:

- Title
- Discipline
- Year coded by date of publication
- Domain coded as either academic or practicing
- Design Model Structure coded by the shape of the accompanying diagram
- Number of total steps, stages and/or activities

Each process was then broken into its constituent activities, adding to the above list these attributes for each:

- Order of the current step/stage/activity, if applicable
- Name of the current step/stage/activity

With an average of six parts per model, there were a total of 430 activities from the surveyed Design Processes. Each activity’s name was placed on a color-coded sticky indicating the overall shape of the process model, and coded for year, discipline, domain, number of steps in the process, and order of the current step.

First Categorization The first round of categorization began by loosely clustering each of the 430 activities into 16 smaller groups, sorting based on similar functions or activities. With the first round of grouping, it became apparent that certain disciplines (e.g., Business, Engineering) focused heavily on implementation/execution activities while others had a greater focus on activities related to gathering data and generating ideas. The 16 groups are outlined in Table 2.2.

Second Categorization In the next phase, the four researchers distributed the 16 initial sets of grouped activities among themselves, assigning sets so that each would be analyzed by two researchers. Each individual researcher then clustered around common keywords and themes, while keeping an eye out for mis-categorized activities. This clustering mainly focused on the names used for each activity.

Third Categorization After all sets had been coded by two independent researchers, the research team came back together for a final round of clustering - this time the focus was on coming up with a good descriptive name for each sub activity, while talking out any discrepancies in the categorization scheme. It was found that the focus on names in the second round of categorization obscured the fact that some terms were used to refer to different activities. To compensate for this and more accurately capture the function of
<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
<th>Subgroupings (Round 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ways to start a project (many of these were placed here because they were Step 1)</td>
<td>Kick-off, Project Brief, Contract, Statement of Problem, Planning processes</td>
</tr>
<tr>
<td>2</td>
<td>Searching, building an understanding and/or observing</td>
<td>Search, Competitive Analysis</td>
</tr>
<tr>
<td>3</td>
<td>Data Manipulation</td>
<td>Analysis, Manipulation, Research, Identify Customer Needs</td>
</tr>
<tr>
<td>4</td>
<td>Summarizing Information</td>
<td>Synthesis, Abductive, Conjecture, Interpret</td>
</tr>
<tr>
<td>5</td>
<td>Deliverables relating to guiding design decisions</td>
<td>Defining the problem, Requirements, Definition, Imperatives</td>
</tr>
<tr>
<td>6</td>
<td>Coming up with new ideas and possible solutions</td>
<td>Ideate, Illuminate, Generation, Conception, Preliminary design, Design, Insights become ideas, Ideas</td>
</tr>
<tr>
<td>7</td>
<td>Selecting concepts</td>
<td>Convergence, Evaluating, Selected schemes, Decide</td>
</tr>
<tr>
<td>8</td>
<td>Final deliverable focused “steps”</td>
<td>Create Navigation Diagrams; Working Drawings; Implementation</td>
</tr>
<tr>
<td>9</td>
<td>Testing Activities</td>
<td>Test product concepts, Evaluate, Testing, Validation studies</td>
</tr>
<tr>
<td>10</td>
<td>Activities related to implementing a design</td>
<td>Prototype, Code, Material Selection, Development</td>
</tr>
<tr>
<td>11</td>
<td>Activities related to improving concepts or designs</td>
<td>Reconceptualize, Revise, Redesign, Detailed Design, Final Specifications</td>
</tr>
<tr>
<td>12</td>
<td>Preparing for deploying to the marketplace/user/finalizing designs</td>
<td>Build/Assemble, Develop implementation strategies, Delivery, Making, Production planning, Product(ion)</td>
</tr>
<tr>
<td>13</td>
<td>Deploying to the marketplace/user/etc.</td>
<td>Product release, Benchmark assessment, Deploy, Release</td>
</tr>
<tr>
<td>14</td>
<td>Communicate to outside parties that a new product/service/etc., is available</td>
<td>Communication, Sell, Document Process, Prepare the Management Guide</td>
</tr>
<tr>
<td>15</td>
<td>Planning activities</td>
<td>Planning, Preparation, Plan next phases</td>
</tr>
<tr>
<td>16</td>
<td>Activities which did not immediately and obviously fit with any others</td>
<td>Socialization/empathizing, Concrete experience, Proposition of hypothesis/model</td>
</tr>
</tbody>
</table>

Table 2.2: Initial clustering groups.
all the examined activities, special consideration was paid to the function of each activity within its original design process.

Fourth Categorization This phase examined the relationships among different design activities, identifying which were included in the execution of others, and capturing the nuances of the functions of all activities. Whether Activities fit neatly into one of the new categorizations was determined by whether the terms could be used interchangeably, if the themes were similar, and if the functions served the same goal in the design process. In order to extract the connections and relationships among activities, the order in which they appeared in their original process models was taken into account. The iterative nature of the Design Processes was also examined.

Common activities

From our analysis, we developed a set of activities that any design process may draw from. A taxonomy of activities is below, with a general process model presented in Figure 2.6:

- Project Motivation - the internal or external impetus to begin a project
- Problem Development - The work done in order to clarify the problem, to better point to possible solutions
  - Information Acquisition - collecting information to inform design decisions or inspire ideas
    * Fieldwork/Primary Research - Research using primary source material, generally collected specifically for the project
    * Armchair/Secondary Research - Using existing information from sources such as publications, for research information purposes. Secondary information sources and/or prior knowledge.
  - Processing design information - a tightly coupled process of analysis and synthesis
    * Data Analysis - breaking up pieces of information into smaller chunks
    * Data Synthesis - combining pieces of data to create frameworks, mental models, etc.
  - Problem Definition - specifying problem characteristics, and/or specifications or requirements for the solution Label major loops in the figure.
- Solution Development - generating and iterating on design ideas, whether conceptual or detailed.
  - Generating Ideas and Solutions - coming up with new concepts
  - Building - creating some physical representation of the concept, anything from a sketch to a final prototype.
CHAPTER 2. DESIGN PROCESS AND COMMUNICATION

- Evaluating, and Choosing solutions - testing, validating, comparing, and choosing ideas

- Solution Finalization/Deployment - finalizing the ideas and either handing to the next team, or deploying for general consumption.

- Project Management
  - Setting Strategy - setting long-term plans beyond the individual project
  - Project Planning - any kind of planning to guide the project
  - Enabling the team - supporting the team members in working together
  - Mobilizing resources - identifying and obtaining access to resources and people for the project
  - Management - Keeping the process on track

- Communication - within and across teams/subteams

- Reflection on practice - reflecting on the design practice, collecting and/or applying lessons learned (as in The Reflective Practitioner [125])

Though a single “set” of activities may fully describe the design process, these activities don’t always occur in the same order in the design process, nor are all of them necessary for a particular design project. There are multiple paths through the model, depending on the needs of the individual project. The simplest processes include steps that correspond to starting at “Problem Definition”, moving directly to “Generating Ideas” and then to “Evaluating and Choosing Ideas”, while some of the more complex will go through multiple iterations of each activity. Building on the work of Rittel and Webber [114] among others, Rowe [119] characterized design problems as falling on a spectrum of complexity: well-defined problems, ill-defined problems, and wicked problems. As problems become more complex, and less amendable to being fully defined, the coupling of the solution and the definition becomes more entwined - each attempt at a solution will throw light on the problem, and the problem definition will need to be adjusted accordingly. Depending on the nature of the problem, the problem definition may not be finalized even when the solution is [114]. Also, different projects may start from different points in the process - one may begin with building out a concept, then move into redefining the problem!

Though there are other important components, the two main activities in any design process are problem assessment and solution development. The former is an iterative process of collecting relevant information from primary (fieldwork research) and secondary (armchair research) sources, and developing that into a “problem definition”. The latter is an iterative process of generating ideas and solutions, then building and/or testing those ideas against the problem definition.

Many engineering process models include phases such as conceptual design, detailed design, etc. (e.g., [5, 48]). In the new model, these would be represented as iterations of the
various activities outlined. For example, in the conceptual design phase, a designer will first understand the situation she is designing for, come up with several concepts and evaluate those, perhaps through direct user testing. She may then move on to detailing out the design, or pass it to another designer or engineer to do so. In the detailed design phase, after understanding the concept to be developed, the designer will generate functional ideas for a particular feature, then evaluate those ideas based on whether they meet the specifications of the concept created earlier, and then decide on which idea to implement.

Refinement of activity set

To examine the relationships among the activities found, they were compared to the activities in the original process models. This comparison searched for the following properties:

- Activities listed in the individual process model
Figure 2.7: Minimal path through design activity cycles

- Activities that the generalized Design Process model has in common with the individual models
- Activities that our Design Process model has that are not reflected in the individual model
- Shape of the structure of the individual process drawing
- The nature of iteration within the process
- Relationships seen within the individual process

The steps of each process were coded to the corresponding activity that paralleled its function. Table 2.3 shows the prevalence of each activity across disciplines, and overall.

Generating ideas (93%), only missing from one model in Liberal Arts and four models in Business, was the most common activity, especially from disciplines that would more
traditionally be considered “design”. The model in Liberal Arts focused on solving math problems [112], and included the step “devising a plan”. The Business models that did not include an explicit generation step, likewise, focused more on devising and executing plans than on product development or design in particular [44, 16, 63, 150].

Evaluating & choosing solutions was just as common (93%), though which disciplines left out this activity were not as consistent – none of the models from Interdisciplinary, Software, Business and Engineering had explicit evaluation or selection activities. However, in these models, it could be said that this step was implied – many of them have steps which would have depended on some kind of a selection process. For example, Matchett’s model goes from “satisfying needs” to “solution”, which may implicitly include a selection process to get to that solution [98].

Actually building the solutions was only clearly included in 77% of the models. Most of the models that didn’t include something similar to a building activity sometimes ended in a communication step, implying that the building activity would take place later. However, there were several that had neither a building, communication nor deployment step, essentially ending with the genesis and/or selection of a particular concept (e.g., [86, 147]). It may be that it is assumed that coming up with the idea is the key factor, but that obscures all the work that goes into developing that idea for deployment, and narrows the scope of design to “conceptual design”.

Though 73% of the 71 process models call out defining the problem in some way – generally by defining specifications or requirements – the activities to support that definition

<table>
<thead>
<tr>
<th>Project Motivation</th>
<th>Interdisciplinary</th>
<th>Creativity</th>
<th>Software</th>
<th>Business</th>
<th>Liberal Arts</th>
<th>Engineering</th>
<th>Architecture</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 models</td>
<td>5 models</td>
<td>17 models</td>
<td>11 models</td>
<td>4 models</td>
<td>9 models</td>
<td>7 models</td>
<td>71 models</td>
</tr>
<tr>
<td>Fieldwork Research</td>
<td>9 75%</td>
<td>2 40%</td>
<td>10 50%</td>
<td>5 36%</td>
<td>1 5%</td>
<td>2 54%</td>
<td>3 33%</td>
<td>30 42%</td>
</tr>
<tr>
<td>Armchair Research</td>
<td>10 83%</td>
<td>2 40%</td>
<td>5 29%</td>
<td>5 45%</td>
<td>2 50%</td>
<td>3 25%</td>
<td>5 56%</td>
<td>42 57%</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>5 42%</td>
<td>2 40%</td>
<td>5 29%</td>
<td>2 18%</td>
<td>0 0%</td>
<td>3 23%</td>
<td>2 22%</td>
<td>27 38%</td>
</tr>
<tr>
<td>Data Synthesis</td>
<td>6 50%</td>
<td>1 20%</td>
<td>5 29%</td>
<td>3 27%</td>
<td>1 25%</td>
<td>2 15%</td>
<td>1 11%</td>
<td>27 38%</td>
</tr>
<tr>
<td>Defining the Problem</td>
<td>7 58%</td>
<td>3 60%</td>
<td>14 82%</td>
<td>8 73%</td>
<td>2 50%</td>
<td>10 77%</td>
<td>8 89%</td>
<td>52 73%</td>
</tr>
<tr>
<td>Solution Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generating Ideas &amp; Solutions</td>
<td>12 100%</td>
<td>5 100%</td>
<td>17 100%</td>
<td>7 64%</td>
<td>3 75%</td>
<td>13 100%</td>
<td>9 100%</td>
<td>66 93%</td>
</tr>
<tr>
<td>Building</td>
<td>11 92%</td>
<td>3 60%</td>
<td>15 88%</td>
<td>9 82%</td>
<td>4 100%</td>
<td>8 62%</td>
<td>5 56%</td>
<td>55 77%</td>
</tr>
<tr>
<td>Evaluating &amp; Choosing</td>
<td>11 92%</td>
<td>5 100%</td>
<td>16 94%</td>
<td>9 82%</td>
<td>4 100%</td>
<td>12 92%</td>
<td>9 100%</td>
<td>66 93%</td>
</tr>
<tr>
<td>Finalize Ideas/Deploy</td>
<td>11 92%</td>
<td>1 20%</td>
<td>12 71%</td>
<td>8 73%</td>
<td>1 25%</td>
<td>8 62%</td>
<td>2 22%</td>
<td>43 61%</td>
</tr>
<tr>
<td>Project Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting strategy</td>
<td>2 17%</td>
<td>1 20%</td>
<td>4 24%</td>
<td>5 45%</td>
<td>0 0%</td>
<td>2 15%</td>
<td>0 0%</td>
<td>14 20%</td>
</tr>
<tr>
<td>Project Planning</td>
<td>5 42%</td>
<td>1 20%</td>
<td>7 41%</td>
<td>7 64%</td>
<td>1 25%</td>
<td>3 23%</td>
<td>3 33%</td>
<td>27 38%</td>
</tr>
<tr>
<td>Enabling the team</td>
<td>2 17%</td>
<td>1 20%</td>
<td>3 18%</td>
<td>2 18%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>8 11%</td>
</tr>
<tr>
<td>Mobilizing resources</td>
<td>4 33%</td>
<td>1 20%</td>
<td>3 18%</td>
<td>6 55%</td>
<td>0 0%</td>
<td>3 23%</td>
<td>1 11%</td>
<td>18 25%</td>
</tr>
<tr>
<td>Management</td>
<td>1 8%</td>
<td>0 0%</td>
<td>3 18%</td>
<td>2 18%</td>
<td>0 0%</td>
<td>1 8%</td>
<td>0 0%</td>
<td>7 10%</td>
</tr>
<tr>
<td>Reflection on Practice</td>
<td>2 17%</td>
<td>5 100%</td>
<td>2 12%</td>
<td>1 9%</td>
<td>1 25%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>11 15%</td>
</tr>
<tr>
<td>Communication</td>
<td>3 25%</td>
<td>2 40%</td>
<td>2 12%</td>
<td>2 18%</td>
<td>1 25%</td>
<td>4 28%</td>
<td>2 22%</td>
<td>15 21%</td>
</tr>
</tbody>
</table>
are less common. For example, only 65% of the processes examined included some kind of research at all, with three-quarters of those having either fieldwork or armchair research, but not both, and armchair research (45%) is a bit more prevalent than fieldwork research (43%). A few concept testing activities were included in the fieldwork research category because they implied going out into the field, and had a separate step for evaluating and/or choosing a concept, so the incidence of fieldwork for problem definition purposes is even less prevalent (36%). This is not to say that these activities are less important, especially in the human-centered design context, just that they are less addressed in process models, many of which do not include a human-centered viewpoint. Likewise, only 42% of models have some kind of data processing (data analysis or synthesis) activity.

The most poorly represented activities, as a class, are the project management activities – especially activities that deal with developing teams (11%) and supporting their progress (10%). Even in the field of Business, only three models mention these types of activities – almost the same set of models which do not include any Generating ideas activities ([44, 63, 150]). That indicates a strong separation of the concepts of “designing” and “managing”, though in practice they would necessarily be linked with each other.

Outside of Project Management, the least represented activity is Reflection on Practice. This is in stark contrast to the ongoing discussion of design as a reflective practice and the importance of the reflective practitioner [125]. Though it is not an activity that is necessary to progress or inform a design project, it is important to consider the act of reflection in order to improve a designer’s ongoing process and development.

In the context of this dissertation, there is a logic to looking at the role of communication in these design processes separately from the other design activities; the next section does just that.

2.4 Communication in design models

Of the 71 processes examined, communication of some kind was mentioned in 20% of the processes. The types of activities that were included in this category included:

- Explicit mentions of communication (e.g., “communication”, “communicate the plan”, “proclaim”, etc.)
- Some kind of presentation (e.g., “showing”, “presentation”, “displaying the model”, etc.)
- Implications of communication (e.g., “proclaim”, “prepare production instructions”, etc.)

Two-thirds of these process steps functioned as the communication of a final solution, with another quarter of them functioning as the communication of nascent design concepts. Only two of the seventy-one processes (3%), both from engineering, include the communication
of design research results: Morris Asimow’s model explicitly includes communication in every iteration of the design process, including the Feasibility Study cycle [5], as shown in Figure 2.8; March’s process is ambiguous in terms of order and role of the different activities, but the communication of design research results can be implied through the coupling of data and design [25], shown in Figure 2.9. Neither of these addresses the communication of an understanding of the user from design researcher to designer. It appears from this analysis that the communication of research results doesn’t happen. However, it may be implied that after defining the problem that definition must be communicated to somebody. Looking more closely at the Defining the Problem activity, it was found to follow a research activity (Fieldwork or Armchair Research) only 27% of the time – less than half the time that research occurred at all. In Engineering, Software, and Interdisciplinary design, half of these problem definitions were in the form of requirements or specifications. Though not always the case, requirements and specifications may obscure the goals of the design and the needs of the users unless coupled with an understanding of the end users needs.

Studies of multфункциональ human-centered design teams typically assume that the people executing the data acquisition and processing activities and the people developing design solutions are members of one cohesive team – a situation not uncommon in User Experience Design. However, in other fields of practice, such as the development of physical products, acquiring, analyzing and synthesizing data about the end user is often done by specialized design researchers, who then report their findings to the design and/or management team. Depending on the organization, the definition of the problem may fall to the design research team, the design team, the management team, or some combination of the three. Commu-
communication of the research insights between the researchers and the other groups then becomes important for successfully incorporating considerations of user needs into the problem definition, the solution, or both, especially considering the co-evolution of the problem and solutions spaces found by Dorst and Cross [40].

Assuming that this communication takes place between these teams, it is useful to examine how it is being done, and what does or does not make it effective. The next chapters will look at relevant theories of communication and at how they are applied in the communication between design researchers and designers.
Chapter 3
Communication, Persuasion and Motivation to Learn

Studies of multifunctional human-centered design teams typically assume that the people executing the data acquisition and processing activities and those developing the design solutions are members of one cohesive team. This is reflected in the minimal discussion of communication between these two steps in the process models examined in Chapter 2. However, in practice, acquiring, analyzing and synthesizing data about the end user is often done by specialized design researchers, who then report their findings to the design and/or management team, often as insights into the lives of the people they studied. Depending on the organization, even the definition of the problem may fall to the design research team, the design team, the management team, or some combination of the three. Communication of the research insights between the researchers and the other groups then becomes important for successfully incorporating considerations of user needs into the problem definition, the solution, or both.

The process of communicating insights is one of teaching and persuading the design and management teams, who we might call the “clients” of the design research team, about the needs of the end users. The research team will collect data about customers and users, including things like quotes from interviews with users and experts, results of user and customer surveys, drawings or photos of everyday use, etc., and then process these into insights, needs, or requirements. These results are then communicated through an additional step in the design process between the Problem Development and Solution Development activities, as shown in Figure 3.1. If they can convince their clients that these are meaningful results, they can then use these materials to help the design and management teams develop a shared understanding of the users and the problems they face. With this improved understanding of the existing situation, the management and design teams can develop better problem statements and solutions. However, developing an understanding depends on the clients’ motivation to learn about their users’ lives. Design researchers work to increase this motivation.

To be able to thoroughly look at the communication practices of design researchers, some
theory on communication, motivation and persuasion is useful. This chapter reviews some of the literature on those subjects to build up an understanding of the mechanisms at work in influencing design decisions.

The first section focuses on communication in general, and explores some of the issues that have been specifically discussed in the design communication literature.

The second section looks at the psychological mechanisms of persuasion. Literature in the design field related to persuasion is focused primarily on persuasive design, applying these principles to changing user behaviors, or to design rational argumentation. Neither of these is the focus of this thesis – rather, it looks at persuasion as it is used between the design research team and their clients.

The third section of this chapter looks at education literature addressing the motivation to learn, as a means for encouraging the engagement of designers in the Problem Development process. Once the audience is persuaded that the information at hand is relevant, they then need to learn the information. Indeed, Barry and Beckman examined the innovation process as a learning process [7].
CHAPTER 3. COMMUNICATION, PERSUASION AND MOTIVATION TO LEARN

3.1 Communication

Communication in the design process, as discussed in the previous chapter, is usually considered as pertaining to the communication of design concepts and solutions – generally to management, manufacturing, or other later-stage teams in the organization. Communicating insights poses separate problems because of the ambiguous and qualitative nature of user insights. However, there is a body of literature on communication within the design team, which focuses on creating a shared understanding among team members within the team, and between the team and its users.

This section first looks at general models of communication and presents an extended meta-model from which to work, and then looks at the design communication literature on creating a shared understanding.

Communication in design

As design has become more complex, organizations have begun creating multidisciplinary teams to bring in multiple perspectives on the problems at hand. The team must then work to develop a shared understanding based on these varied perspectives. Creating a shared understanding is the focus of much of the literature on communication in design teams (e.g., [2]).

When examining how design teams create an internal shared understanding based on user insights, Hey, et al., [70] proposed a four stage framing cycle (see Figure 1.4), where teams make their initial frames explicit and then work through their differences to come to a shared understanding. However, Hey, et al., primarily conducted research on student teams and firms where the designers were also the researchers, or at least worked on the same team. When the designers and researchers are not in the same team, the framing cycle still needs to be gone through, both within each group and then also across groups. In other words, after the researchers explore what their differences are and then create a shared framework, they must then repeat that process with their clients. In a coherent team, the team can go through the cycle multiple times to develop a shared frame between each other and the users. In a disjointed team, cycles require more coordination, and may be limited based on location and ability for the sub teams to meet, etc. As a team works together, it develops a shared language and way of thinking. Between sub-teams, a shared vocabulary may be missing or mis-leading, given the different thought worlds each team will have developed. In some cases, common words may be used differently by each group. Bridging those vocabularies and ways of thinking adds additional challenges to developing a shared understanding. This requires being able to not only communicate insights clearly, but also do so in a way that speaks to clients’ current frames so that a shared framework may be negotiated quickly. This is complicated by different cultures across disciplines, teams, and organizations [85, 124].

Stompff, et al. [137], found that artifacts depicting intended outcomes strongly contribute to HCD. The development of the product story helps develop a joint, or shared understanding among the different members of the team on what it is that they are developing, and on the
process they will follow. So, too, do experiences, which are events that can be experienced and reflected on by all specialists involved. Echoing Bartel and Garud’s call for “innovation narratives” [8], they recommend the use of product stories - a shared narrative that explains expectations for the future product that all team members are working on, which develops as the product does.

Research on the role of artifacts in design communication has examined how *boundary objects* facilitate communication across organizational and cultural boundaries [24]. Star and Griesemer define boundary objects as “objects which are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites” [135]. They are not necessarily physical objects, but essentially constitute the passing of fixed information from one group to another. Rather than creating a shared understanding, boundary objects provide information that is used differently in different communities – though the interpretation is plastic the content itself remains constant. Some boundary objects, such as CAD drawings, may shape action as well as facilitate communication, thus acting also as “conscription devices” [68].

There are many people who have examined the use of particular artifacts and methods, such as “Design Documentaries” [113], roleplaying [133], etc., specifically for communicating insights to the design team. In Chapter 6, these will be examined for the underlying techniques and principles for embodying insights.

**General models of communication**

Communication models tend to fall into one of two categories: mechanistic or sociocultural. Examining these models will provide a vocabulary with which to discuss the issues of communication within design.

**Mechanistic models**

A common model of communication is based on Shannon and Weaver’s [128] model of information transmission in communication technology (source, transmitter, channel, receiver, and destination). Building off the concept of “people as computers” (e.g., [101] [142]), this mechanistic model has been adopted as a metaphor for human-to-human communication. This sender-receiver metaphor places emphasis on the sender and message, while deemphasizing variations in context and individual communication partners. The criterion for successful mechanistic communication is the match between message packaged and sent, and message received and decoded.

The transmission metaphor focuses on the broadcasting of information through a medium, and highlights issues that also affect technological communication, such as the effect of noise, incompatible data systems, etc. *Noise* refers to extra bits of data that obscure the signal, such as unimportant information or irrelevant distractions obscuring the main message. How much can be communicated is limited by the *channel capacity*. In technological communications, this is essentially the bandwidth and speed of the channel. In design communication,
this may be limited by how much time and attention the audience has to spend absorbing the information presented, or increased through the use of multiple modes of presentation. Though the transmission model is useful in understanding the basic components of communication, its emphasis on broadcasting information obscures important issues in cross-team and cross-discipline communication, such as those of interpretation, negotiated meaning, and resistance to new information, which have more to do with the understanding and acceptance by the recipient.

Approaching design communication from this mechanistic viewpoint, Newman and Lieu identified message, author, audience, and medium as key components in communication. Their framework and recommendations discuss tools for learning about the audience’s needs and initial understandings, primarily by surveying the audience about their prior knowledge. This starts to address the understanding of the audience by making sure that the information presented is based on their current knowledge base, a notion that will be leveraged in Chapter 4 where practices for understanding clients and their knowledge bases are examined.

Sociocultural models

Other models presume that regardless of what the speaker intends and attempts to communicate, that which the listener is capable of understanding given their current set of knowledge and experience constrains the meaning (e.g., [6]). Successful communication in these sociocultural models is not just the transmission of a statement (e.g., “I have finished building the prototypes”), but also the understanding of what the listener is to do with that information (e.g., the speaker may be indicating that the prototypes are ready for the listener to test them with users). Luhmann proposes that success is dependent on a threefold selection process: a) the speaker must chose the information they would like to include in their message; b) they must then choose a medium and form; and c) the audience then selects a possible way of interpreting and understanding the message [91]. If the selected interpretation is not aligned with the intended interpretation, it is only through continuing discussion that the miscommunication can be remedied. The focus then lies on how the author and audience interact, as their ongoing dialog shapes the meaning of a particular piece of information. Where the transmission model of communication focuses only on the content of the communication, these models also consider how and why it is communicated. Communication issues arise when the author and audience have a different understanding of the intended message and interpret it in different ways.

Maier, et al. identify these models as having a more sociocultural, or systemic viewpoint. They see information transmission as embedded in understanding, and so propose a meta-model of communication where the mechanistic model is situated within the context of the systemic, as seen in Figure 3.2. One side of the model identifies possible issues arising at each level, with tactics for controlling those issues presented on the other side. In this way, the mechanistic issues of noise, data handling, and mis-matched systems are coupled with tactics such as facilitating smooth information exchange through the use of a computer tool
or prescribed method and reducing noise by increasing channel capacity. Systemic issues of misinterpretation and misunderstanding are coupled with tactics such as engaging the communicators in an ongoing learning process and increasing their awareness of each other.

### Extending Maier’s meta-model of communication

Dougherty [41] found that different departments evolve internally shared systems of meaning and knowledge, which she called “thought worlds.” Ideas that do not fit the system may be reconfigured or outright rejected, so that particular departments within a company may be more or less open to particular pieces of new information. Building on this, Carlile proposed a pragmatic view of knowledge as being localized around a particular issue, while also being embedded and invested in practice [24]. This view highlights the resistance people have to new information that puts the knowledge that they have accumulated and use “at stake.” People are reluctant to change their knowledge because it may be costly to reconfigure their thought world to accommodate it [24]. In fact, the cost of reconfiguring one’s thought world may be so high that one’s reluctance to accommodate new information may appear as an inability to do so. A group or individual’s reluctance or inability to alter their thought world compounds the inherent difficulty of creating shared frames across boundaries. Roschuni, Goodman & Agogino [117] refer to this reluctance as inertia, and extend Maier, et al.’s [97] systemic level of communication to include inertia and translation aspects, as shown in Figure 3.3. For inertia, Roschuni, et al. [117], identified cognitive bias and resistance as sources of communication issues. They propose that the activities design researchers do to extend the life span of their research findings – designing “actionable” deliverables, “socializing” their research, and helping their clients develop a sense of ownership – are techniques for influencing issues of inertia. These techniques are essentially persuasive forms

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1It is common to use “translation” to describe mechanistic issues of moving information between locations (e.g., in [97]). However, the more general definition of translation – “expressing the sense of words in another language” – is used here to signify the work of making ideas intelligible across thought worlds.
CHAPTER 3. COMMUNICATION, PERSUASION AND MOTIVATION TO LEARN

3.2 Persuasion

Persuasive communication is intended to invoke a change in attitude or behavior. In the case of design communication, the design researcher is attempting to increase the extent to which the results of the research are used as inputs into the design decision process. This requires the designers to, not only be persuaded that the work is worthwhile, but also to be motivated enough to integrate the new information into their decision process.

It is important to make a distinction here between persuading the designers to build a particular product, service, etc., and persuading the designers to use design research insights as key inputs into their design decisions. Depending on one’s philosophy about the role of the design researcher in the design team (from “anthropologist outsider” to “co-designer”), the persuading designers to build a particular solution may or may not be appropriate or desirable. However, in all cases, persuading the designers to consider design research insights is a goal of design research communication.

In order to persuade people to willingly act in a particular way, you have to change their underlying attitudes. Attitudes are defined as learned tendencies to evaluate things a certain way [130]. Zimbardo and Ebbesen identify three components to an attitude which, when altered, may produce an attitude change [154]:

**Emotions** are how one feels about a subject, object or person, and are based on one’s values.

Figure 3.3: Extended meta-model of communication
Behaviors are generally a reflection of a person’s attitudes, but they may also influence one’s attitudes in return.

Cognitions are one’s beliefs or thoughts about a subject, which may or may not be true.

Persuasion through emotional appeal

Emotional appeals, or what Aristotle termed Pathos, are commonly found in advertisements, political campaign messages, and motivational speeches. Though it is appealing to think that humans are capable of being purely rational, research suggests that even complex decisions are made through a blend of both feeling and reason, though the ratio depends on the situation [89]. With complex decisions, it’s not actually possible to be fully rational, given the limited ability of the conscious mind to process large amounts of information simultaneously. In addition, experiences that are accompanied by emotions receive preferential processing in the brain [29].

Through the presentation of a story, image, or emotional display, such as those captured in quotes, photographs, or videos collected during design research, emotional appeals aim to generate emotions favorable to the persuasive goals of the communication. In some cases, the emotions evoked may not themselves be positive. For example, a story about someone struggling with their diabetes may invoke pity or sadness, reinforcing an argument that better diabetes care systems need to be designed. Showing images of the consequences of drunk driving may invoke fear, defensiveness, or outrage, while bolstering the argument that there is a need for a new program or service to reduce driving under the influence.

Addressing the existing values of the audience is useful for influencing them on an emotional level. First, the persuader must know the audience’s viewpoints well enough to speak to them, and then they can present appeals that reinforce or challenge those viewpoints. As social creatures, people also feel social pressure to conform to those around them, and will look to their companions for cues on how to think, feel and act, to the point that they can be persuaded to give an obviously incorrect answer to a multiple choice vision test if those around them all give the same incorrect answer [4].

Alternatively, classical conditioning can be used to create positive emotional reactions to an object, person or event by associating positive feelings with the target object. In this case, the argument is coupled with a person, object or event to which the audience already has a strong positive reaction. For example, an argument made by a loved one, or by an attractive stranger, will have more effect than an argument made by someone less attractive or cherished. Essentially, the more you like the person that is presenting the argument, the more likely you are to agree with him or her [31].

Factors that influence the effectiveness of an emotional appeal include the audience’s belief in their own competence regarding the issue, how accessible their attitude is to change, how involved they are in the issue, and message/source features such as attractiveness, trustworthiness, etc. [80].
Persuasion through behavior change

The underlying reasons that people will adopt an induced behavior without first changing their attitudes or beliefs fall into two main categories: compliance and identification \[81\]. Compliance is when an individual changes his or her behavior in the hopes of achieving a favorable reaction from another person or group. Identification occurs when an individual changes his or her behavior in order to maintain or establish a satisfying self-defining relationship.

In either case, people who act inconsistently with their beliefs may experience what is called cognitive dissonance. Cognitive dissonance theory is one of a number of consistency theories (e.g., \[103, 118, 67\]) that build off the assumption that people experience a sense of guilt or uneasiness when they think they are being inconsistent \[51\]; the greater the inconsistency between two cognitions or behaviors, the greater the unease.

In persuasion, cognitive dissonance theory translates to the concept that if you can get someone to speak or behave in contrast with his or her private opinion, he or she may change his or her opinion to match his or her statement or behavior. Essentially, people will change their attitudes, beliefs, or behaviors to reduce the dissonance they experience when there is inconsistency between any subset of the three. The theory states that inducing someone to speak or behave in an inconsistent manner creates an aversive state of tension, which then leads to explanatory thoughts, and results in an attitude consistent with the behavior \[111\].

Festinger and Carlsmith \[52\] tested this theory through an experiment where male undergraduates were offered money to engage in counter attitudinal behavior. After spending an hour performing two tasks designed to be very boring, a subject was told that the study concerned the effect of a prior expectation on task performance. Those not in the control group were then told that the next subject meant to have a positive expectation, and were offered either $1 or $20 to provide a favorable report of the experiment to the person waiting in the next room (a paid confederate of the researcher). The $1 amount was chosen to maximize cognitive dissonance by providing just enough pressure (in 1959) to participate, but not enough to justify participating for money alone. After performing the role-playing task, the students were then referred to an interviewer who was supposedly conducting a survey unrelated to the experiment. The interviewer asked them, among other things, how enjoyable the tasks were on a 10-point scale. The results showed that the subjects given $1 for praising the tasks evaluated them significantly more favorably than the control group, while those given $20 had attitudes comparable to the control group, which didn’t make insincere statements to the confederate.

In this experiment, the $20 subjects experienced less cognitive dissonance than the $1 subjects, since they were able to justify their actions in terms of compensation. For the $1 subjects, on the other hand, it was easier to change their attitudes toward the dull task to be more positive than it was to change the fact that they had already claimed it was enjoyable, or to convince themselves they were really doing it for the money. Festinger and Carlsmith concluded that the larger the pressure to elicit the new behavior, the lower the cognitive dissonance will be, and a smaller attitude change will occur \[52\]. In design, this
may be applied through getting designers to agree to participate in design research activities on a trial basis. Once they’ve participated of their own volition, they will be more likely to consider themselves as the type of designer that takes part in design research activities.

**Persuasion through cognitive processing**

Providing an individual with new information affects the cognitive component of attitudes, and will tend to cause that individual to change her overall attitude about a topic \[118\]. According to two overlapping theories, the Elaboration Likelihood Model (ELM) \[110\] and the Heuristic-Systematic Model (HSM) \[27\], people process new information messages in one of two modes: high-cognition or low-cognition. The high-cognition state corresponds with high motivation and the ability to process in-depth and systematically, while the low-cognition state corresponds with lower motivation and/or ability. In the design process, this type of persuasion is especially tied to theories of education.

**Low-cognition processing**

In low-cognition processing, decisions are based on readily available information, emotions, or other cues and shortcuts. These include factors such as the expertise, credibility, and trustworthiness of the argument source – what Aristotle termed the *Ethos* of the argument. When communicating design research, both design researchers and members of the client organization who work most closely with them may be perceived as the source of the research findings. As discussed in the section on emotional appeals, people may also use others’ decisions as proxies for their own, trusting that similar others will come to similar conclusions.

**High-cognition processing**

In high-cognition processing, individuals are persuaded by the content and logic of the message. Attitude change resulting from high-cognition information processing usually leads to internalization, resulting in longer more stable change. Evaluations are based primarily on the strength or logic of presented arguments, what Aristotle termed *Logos*, which means that the presentation of the arguments must be comprehensible to the subject. The abilities of people to parse information vary based on their mental, emotional and physiological state, as well as their initial understanding of the subject \[111\]. Thus, a key factor in preparing logical arguments is understanding the audience’s current point of view and knowledge base in order to build arguments that are easily processed given their current state.

Though the premise of any argument relies upon identifying shared values and agreed upon facts, people have different preconceptions about the way the world works; without knowing the values and beliefs of the audience, the persuader will not be able to build her argument on a solid premise. However, after establishing the premise, evidence is presented and deduction or induction is used to draw or indicate a conclusion. Deduction refers to an argument which uses a generality, such as rules or laws, to predict a specific instance, while
induction uses specific instances to infer the outcome of a similar subsequent instance. Evidence most often comes in the form of facts, statistics, quotations from experts, or informed opinions – in design research, evidence to support insights may include the results of a survey, user experiences (especially first hand experiences presented in video), or quotes from expert interviews. In getting buy-in for the research itself, examples of previous successful projects may be cited.

Principles of Persuasion

Cialdini [31] reduced the literature on persuasion to six principles which may be used to increase one’s chances of persuasion: liking, reciprocity, social proof, consistency, authority, and scarcity.

1. **Liking:** The principle of liking draws on people’s feelings about the persuader to make an emotional appeal – as discussed above, people tend to agree with those they like. The two factors that most reliably generate affection are similarity and praise, and Cialdini suggests finding real similarities and shared values, while giving genuine praise [30].

2. **Consistency:** As described by Cognitive Dissonance Theory and the theories that preceded it, people try to be consistent with what they have said or done in the past. The effect is increased if commitments are made explicitly, in front of others, and voluntarily.

3. **Social proof** As mentioned earlier, people look to those they know and identify with for cues on how to think, feel, and act.

4. **Reciprocity:** This is an emotional appeal to a feeling of social obligation. As social creatures, humans have a tendency to treat others the way they are treated, and to return favors whether asked for or not [31]. Cialdini suggests modeling the behavior you seek, whether it’s a sense of trust, a spirit of cooperation, or open consideration of the others’ viewpoint. Trust and trustworthiness are built on aspects of this principle through sharing experiences, mutual disclosure, and demonstrating non-exploitation of vulnerability [100].

5. **Authority:** According to Cialdini, authority comes from expertise. Though people defer to those with expertise as a shortcut to making good decisions, those with expertise often assume that others recognize and appreciate their experience when they don’t [30]. Cialdini does not address authority from power, since he found that voluntary commitments lasted longer. However, it should be noted that the ability to make and enforce consequences do play a role in one’s authority.

6. **Scarcity:** The less people can have, the more they want [3]. This principle can be seen as another short-cut – people assume that if something is scarce, it is valuable. This
is true even of information, and design researchers can employ it by pointing out that the information being presented is exclusive.

Cialdini’s Principles of Persuasion incline the audience to consider and agree with the opinions and arguments presented. However, in addition to these six principles, it’s important that the information presented is credible and valued, and opinions are built on credible evidence and reason (Logos) [111].

3.3 Motivation to Learn

In many ways, design researchers are attempting to teach their audiences about the end user. And as in any learning environment, the success of the instruction is dependent on the student’s motivation to learn about the subject. There is no learning without some type of motivation spurring that engagement. In other words, designers will not learn about their users if they aren’t motivated to do so. As an “educator” attempting to engage an audience, a design researcher needs to understand the personally relevant goals of the people listening to the presentation. If the presentation doesn’t in some way meet these goals, the audience will pull very little from it, and they may eventually conclude that it is a waste of their time [149].

Persuasion and instruction are quite similar: both require conscious cognitive effort by the listener and are based on providing arguments and evidence for the purpose of getting someone to do or believe something [83]. However, where instruction is a process of imparting new information, persuasion is a conscious effort to shape the evaluation of that information in a particular direction. For the needs of users to have an impact on the end design, the designers must develop a favorable opinion toward the idea that the problems the users face are worth solving, and then change their actions accordingly.

Motivation is defined as that which determines the magnitude (degree of effort) and direction (goal orientation) of behavior. Each person has a unique profile of motivational drivers, values, and biases [105], which can range from highly transitory states of arousal to reasonably enduring preferences for certain types of activities [79]. These may be broken up into internal and external factors.

Intrinsic motivation

Intrinsic motivation occurs when people engage in a behavior for the inherent satisfaction it provides [121]. Those that are intrinsically motivated are more likely to engage in the task willingly. Four intrinsic rewards that provide a feeling of accomplishing work that is significant and worthwhile include meaningfulness, choice, competence, and progress [140]. If design researchers can tap into these motivations when engaging designers, they may have more success in keeping their attention.
A sense of meaningfulness is the feeling that your work is worth your time and energy - that you are “on a valuable mission and that your purpose matters in the larger scheme of things.”

Choice refers to the sense that you have the opportunity to select the activities that you judge to make sense and perform them in a way that seems appropriate.

Competence is the feeling that you are skillfully accomplishing your tasks, and involves the sense that you are doing good, high-quality work. It’s related to the concept of self-efficacy, which is an individual’s belief that they are capable of doing competent work.

Feeling that you are making progress comes from a sense that you are moving forward in your work.

In addition to these four intrinsic rewards, people are also motivated to engage in topics or activities that they are interested in – another strategy design researchers can leverage in designing effective communications. In psychology, the study of interest can be broken down into two major vectors. Interest can be seen as both an emotion (similar to curiosity) and a set of subjects that one engages with for intrinsic reasons.

Situational interest

Situational interest is similar to curiosity or exploration. The experience of interest often includes a quality of attention and a sense of delight, with a positive hedonic valence related to excitement and enjoyment.

The interestingness of something stimulates situational interest. Factors that affect interestingness are common across people: novelty, surprise, complexity, and ambiguity. These all stimulate uncertainty and/or conflict with existing beliefs or values, which leads to the desire to acquire new information in order to reduce the uncertainty or conflict (i.e., cognitive dissonance). Note that the amount of interestingness will vary between people, depending on their current knowledge set, what they find novel, and their ability to unravel complexity. Novelty and surprise capture an individual’s attention by casting doubt on their current understanding of the world. Complexity is a particularly interesting factor because it needs to be balanced. If a subject is too complex, the learner may find it incomprehensible and stop attending to the stimulus; too simple, and they will become bored. New information and new experiences need to build on the previous knowledge and experience of the learner, and be introduced at a pace that sustains their interest. Designing interesting tasks must be based on an understanding of the people who will engage in them.

Situational Interest generally has a short term effect on a person’s attention and motivation to learn a given topic. However, learning about a new topic can then turn a passing situational interest into a lasting dispositional interest. Research on the relationship between
prior knowledge and interest suggests that “working on interesting, compared to neutral, materials may engage deeper cognitive processing, arouse a wider, more emotional, and more personal associative network, and employ more imagery” \[141\].

**Enduring interest**

Enduring interests are the type of interest that is referred to when one says someone “has an interest” in a subject. These interests develop over time, and manifest as an orientation toward seeking out or paying attention to information on the subject of interest. In these cases, there is an essentially linear relationship between one’s prior knowledge about a topic and the interest one has in learning more about that topic, until the point that there is nothing more to learn about a topic \[141\].

As an emotion, interest is associated not only with parts of the brain that comprehend and anticipate information, but also with the reward portions of the brain – learning new information when one is curious is essentially akin to acquiring food when one is hungry \[78\]. The intellectual activity in learning about a topic with the right amount of complexity may even manifest as a “flow” experience \[38\], which can provide a stronger impetus to engage with the topic again. After a series of these satisfying experiences engaging with a subject, an expectation may develop of future satisfying experiences through future engagements, leading to a dispositional interest. In a way, before interest can be a cause of learning, it must be its consequence \[75\].

If one can cultivate a designer’s interest in other people, and in the end user in particular, their intrinsic motivation and willingness to learn about those others will increase.

**Extrinsic motivation**

Rather than being spurred by enjoyment of the actual activity, extrinsic motivation is derived from the desire to attain a particular outcome. In education, these might include grades or getting into a good college. In design practice, these might include receiving a design award, or seeing the product on store shelves, or just getting a good performance review. Extrinsic rewards may be internalized. For example, one may enjoy the satisfaction of getting good marks and therefore put up with the work that is required to do well in a course.

However, research has shown that for some tasks, extrinsic motivation can lead to over justification, subsequently decreasing intrinsic motivation \[39\].

**Principles of Motivation**

A few people have put together collections of variables that may affect motivation, interest, and motivation to learn. Dan and Chip Heath identified six factors that make a message “sticky”, or easier to remember – these all increase the interestingness of the message \[66\]. Keller and Burkman \[80\] and Goslin \[60\], meanwhile, suggested variables that inspire people to learn, while Thomas identified work motivators as mentioned earlier. Many of these
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Variable sets overlap in some way. For example, many of them mention the importance of grounding your message in the viewpoint of your audience [80, 60, 140]. By grouping similar concepts among the sets, common principles emerge: Relevance, Challenge Level, Positive Outcomes, Variety, Surprise, Completion, and Trust.

1. **Relevance:** This principle revolves around connecting the information presented to the needs of the audience. If the information or work presented does not connect to what the audience values in some way, they will not be able to see the value in incorporating that information into their work. Essentially, it is not enough that the design researcher understand how the insights may affect the usefulness of a final product – he must also help the designer to see how insights about the user can help her meet her own goals of producing good products. Concrete details draw people in by adding richness and detail. Often, they will then fill in any missing details from their own experiences. By referencing their own lives, they will perceive the information as more relevant. [80, 60, 140, 66]

2. **Challenge Level:** Another principle is to present information in a way that is accessible to the audience, and challenging enough to interest them. This can be supported by previewing the information to be presented, so that people can follow along without getting confused, and then clearly building complex concepts from simpler ones that are familiar to the audience. However, it’s also important not to present the concepts too simply – if the concepts are not challenging at all, the audience will get bored and lose interest. The level of challenge should push just beyond the audience’s current level of mastery [38], actively involving it in the creation of new understandings. This principle, like Relevance, depends on an understanding of the audience - in this case, of their current knowledge base and biases. [80, 60, 72]

3. **Positive Outcomes:** Tapping into emotions of the audience can help create a sense of meaning. Another positive outcome which provides intrinsic motivation is a sense of competence – to promote that, Keller and Burkman suggest providing an opportunity to apply newly acquired skills and knowledge in a meaningful way. The use of extrinsic motivators can increase motivation when there aren’t meaningful intrinsic motivations to learn. [80, 140]

4. **Variety:** Variety refers to the fact that people will become saturated and bored with repeated stimuli. Using multiple communication channels, such as speech and visuals, not only makes concepts more accessible to people with different learning styles [84], but it also reinforces learning by repeating the message without being annoying. Novelty is an aspect of this – something that is novel adds variety in a new way. [80, 60, 49]

5. **Surprise:** As mentioned, surprise drives people to learn more about a subject to diminish cognitive dissonance brought up by the surprise. In addition, because of the involuntary attention a surprising stimulus evokes, people remember surprising facts
and images better. The new information is often internalized through the use of a new story of the way the world works.

6. Completion: People have a natural tendency to want to hear the conclusion of a story or open question. By posing a rhetorical question, telling the start of a story or creating an ambiguous situation, an emotional tension is created called narrative desire, or “desire for the end.” People have varying levels of comfort with an unfulfilled or prolonged narrative desire, but tend to stay engaged in a narrative or explanation until it is fulfilled.

7. Trust: This is made up of trust in the expertise of the person presenting the information, in one’s ability to collaborate with them, and in the validity of the information they are presenting – this is a combination of the persuasive principles of Authority and Liking and Evidence.

How the principles of persuasion and motivation are used to increase the impact of design research communication will be examined more thoroughly in Chapter 5.

3.4 Concluding remarks

The common thread through all three of these bodies of literature is that success – successful communication, successful persuasion, and successfully motivating others to learn – depends on connecting the message to the current viewpoint of the audience, which requires an understanding of what that viewpoint is. In communication, the tactics for dealing with misunderstandings are awareness of the other party and learning about their viewpoints. Persuasion is more effective if you address the recipient’s values and current level of understanding. In motivating someone to learn, and in education on a broader level, it is important to understand who you are attempting to engage in order to design tasks that are interesting and optimally challenging. For design researchers, the audience consists of designers and other stakeholders in the design process. By understanding these designers and stakeholders, design researchers will be better able to inspire, engage and persuade them.

Design researchers are expert at learning about other people, and understanding their thought worlds, values, and motivations. The next chapter will examine how they use those skills to also learn about their clients – the users of their design research results.
Chapter 4

Understanding and Engaging Designers

As seen in the last chapter, successful Communication, Persuasion, and Motivation all hinge on how well the speaker understands the audience. This chapter examines the practices of design researchers,1 exploring how they work to understand their clients using the same techniques and skills they use to understand end users, and then use that understanding in developing actionable communications. The chapter focuses on the perspective of the design researchers and explores the language, such as the concept of socialization, that they use to discuss their communication activities. Chapter 5 revisits the same research for evidence of persuading and motivating principles outlined in Chapter 3.

After a brief discussion on methodology, the following sections begin by looking at the communication issues especially relevant in communicating design research. They then explore how design researchers view their clients as “users” of their research results and propose an approach to client communication, the double ethnography, which builds on this view.

4.1 Methodology

This chapter draws on a tradition of design inquiry that treats design as a social process where dialogue and argumentation enable design stakeholders from different disciplines to collaboratively assemble a coherent and believable “story” about the product and the context in which it will be used. That story – expressed in specifications, scenarios, reports, and budgets – motivates production. Tracing and interpreting the creation and assembly of design stories requires attention not just to the final outcome, but to the interactions of various actors along the way. This attention to the details of everyday work practice motivates the choice of methods. In-situ interviewing and workplace tours surface how people discuss

1The analysis presented in this chapter was performed with Elizabeth Goodman, and can be found in [117]
their work in context (as in [12]); in-person project observation allows for following decision-making and tool use as it happens, rather than retrospectively (as in [22, 139]).

**Study participants**

This study focuses on the experiences of recognized experts in design research, engineering design, and interaction design. Participants were selected from a variety of fields in order to maximize variation in project domain and stakeholder discipline. The design researchers interviewed had all worked on both digital (e.g., software, websites) and physical (e.g., food packaging, automobiles, and industrial electronics) products. The design engineers all had a mechanical engineering background, and worked primarily on mechanical designs in close collaboration with design researchers. Some of the interaction designers interviewed had worked in both a research and design capacity – often on the same project – thus straddling the two disciplines, but primarily worked in digital products. Each workplace selected for project observation was well-known and respected in the field of interaction design, as measured by prominence of clients (Fortune 100 and 500), leadership in industry associations, professional awards, published books, et cetera. This focus on experts is, of course, also a limitation: the findings may not be representative of the communication practices of less expert practitioners, or of communication practices elsewhere in the world. Participants are referenced with a coding scheme based on professional field and chronological order of interview or observation: researchers are coded as R (e.g., R-01), interaction designers as IxD (e.g., IxD-01), and design engineers as DE (e.g., DE-01).

**Study activities**

Study activities included both interviews and workplace observation. Interviews were conducted with thirteen design researchers, twenty interaction designers, and three design engineers at twenty-two companies across four major United States metropolitan areas. All interviews took place at participants’ workplaces, and lasted between one and two hours. Design research communication was also observed in four projects at three interaction design consultancies in San Francisco.

The interview guides can be found in Appendix A. Questions for those who primarily conduct design research (design researchers) focused on the research and communication process. Questions for those who primarily conduct design activities (design engineers and interaction designers) explored experiences of receiving and interpreting design research communications, with particular attention to artifacts made for and during communication. Note that the interaction designers who did both types of activities were interviewed from both sets of questions.
Analytic approach

The methodological tradition of grounded theory is the foundation for this analysis. Grounded theory emphasizes inductive theory-generation, based on iterative rounds of data categorization or “coding” [47], interspersed with synthetic analysis and purposeful recruitment of further participants in order to clarify and refine specific themes. In this case, two researchers independently performed “open coding” on interview transcripts, observation field notes, and photographs to identify critical concepts at stake [138], iteratively moving between analysis and systematic recruitment of further participants in order to answer the questions analytically generated. This study draws on the analysis of concepts common to two separate research projects – one consisting of the interviews and workplace tours, and the other consisting of the project observations – with further axial coding [138] performed on the conjoined data. The analysis is thus based on a multi-site and multi-group study, with conclusions internally cross-checked between the two. In addition, the validity and applicability of each study’s analysis was verified by presenting emerging conclusions to relevant professional experts.

4.2 Examining communication challenges in HCD

As discussed earlier, researchers are often organizationally and culturally separate from the product teams they serve. In fact, all the participants in this study conduct their design research outside the design production context (e.g., [35]; [145]). This section examines how systemic communication issues of translation and inertia manifest in the contexts studied.

Translation across organizational boundaries

Researchers and their clients are often located in different companies or organizational units, and researchers may not even know the identities of the various stakeholders involved, let alone understand their information needs. Figure 4.1 shows the complexity of the communication task when the design researchers have clients, known stakeholders, and unknown stakeholders all from different organizational units or companies. As organizational boundaries are crossed, effective communication becomes more difficult. For example, the research team may be a subcontractor for a consulting company (known stakeholders) that was hired by the end client company (unknown stakeholders). In other cases, the group within the client organization who hired the research team (known stakeholders) may answer to another internal group (unknown stakeholders) (R-04) - a kind of internal “client’s client” situation. Clients and client’s clients may come from disparate parts of an organization such as program management, marketing, strategy, or manufacturing - each with different disciplinary perspectives and information needs.

Yet many researchers feel obligated even to distant organizational groups. R-11 points out, “Whoever is the ultimate client, at the end, that’s our client, even if we’re working with
an intermediary client. Then her goals are our goals, which means the end client’s goals.”

Different cultures across disciplines, teams, and organizations complicate translation:

A lot of it has to do with the culture within our client organizations. [...] We need to basically communicate in a way that not only as I say engages them, but also that they can use to further move the project through the organization.

– R-13

Translation issues become especially prevalent with greater organizational separation (as in client’s client situations). When the design team and research team can’t communicate directly, the intermediary’s ability and willingness to negotiate a shared understanding with both parties becomes critical. Mediated organizational relationships may also produce mechanistic problems, compounding the issues of translation. For example, research may stop while messages travel back and forth from the researcher to the client’s client, getting garbled in the process. Researchers sometimes ask for direct talks with the design team (e.g., IxD-01), but when those attempts fail they are forced to fall back on embedding the research intent into documents or supporting the intermediary to be an effective communicator.

Having lost its original creators, research intent may not survive translation across organizational boundaries once embedded into a document:

It’s easy to just start to miss the intent and start changing it. Especially as it goes more downstream and it gets into optimization and how are you going to commercialize it and stuff it’s really easy to just start like, slashing features cause you’re doing your job without knowing that like, that rounded corner was the most important part of the big idea.

– R-13
Information about why seemingly minor details, such as a rounded corner, might matter to end users, may need to be communicated to stakeholders who have the power to change that corner. Unfortunately, researchers cannot always anticipate exactly who that will be.

**The hired antagonist versus inertia**

Researchers are often hired to bring to light insights and ideas that the company has trouble seeing for itself. They are, essentially, there to help the company break out of past inertia. One researcher (R-10) told several stories where the success of a new idea came down to one person in the client company risking dismissal in order to change the project direction. In these stories, the people risking their jobs were sometimes new to the company, and sometimes just unusually open to new ideas. The persistence of these war stories illustrates research consultants’ belief that conflict is an important part of their job. At the beginning of each project, R-04 asks “what are we up against here?” as he looks for project “champions.” For them, research consultants are brought in to “shake things up”:

> In a way we’re hired antagonists, you know, we’re designed to kind of shake up the process and tell people things they don’t know and there’s always something that’s going to upset somebody, and that’s fine. But at the same time, you have to create enough good will that people want to continue telling your stories after you’re gone. – R-03

The role of hired antagonist, as an independent “knowledge broker” moving between organizations and teams, offers both strength and weakness. On the one hand, researchers believe that, as outsiders, they can take a fresh perspective on old dilemmas. On the other hand, they may be unfamiliar with the positions, interests, values, and agendas of the people whose decisions they are attempting to sway, especially if faced with a client’s client situation. Though inertia issues are of course not unique to HCD, they are especially pressing when a company needs to take a new direction in order to connect to customers. Researchers, particularly in NPD, define successful work by its ability to overcome organizational inertia and allow companies to take advantage of the opportunities identified in the research (R-01).

**4.3 Treating clients as users**

Researchers often invest considerable amounts of time and energy carrying out a micro-HCD process with their client organization within the broader HCD process of product development, essentially treating their clients and stakeholders as *users of research outcomes*. From the first kickoff meeting, researchers may use their interactions with clients and stakeholders to map relationships, motivations, and priorities within the organization. They work to understand organizational priorities, communication patterns and preferences, as well as biases and assumptions within existing company culture.
To assure project success, researchers often try to bridge cultural and organizational disjunctions between them and their clients’ organization, while also bridging the needs of clients and their end users. Their goal is not just to identify what the designers and engineers need to know, but also how best to design actionable communications so that the users of the research “get it” (R-12), and are able to overcome both interpretation and inertia issues. If they have no previous experience with the relevant stakeholders, researchers work to understand the motives and backgrounds of all those involved.

**Researcher-client relationships**

In particular, research companies use “stakeholder interviews” across the organization as a way to investigate project aims, areas of cultural friction, and organizational dependencies. These interviews can include design engineers, marketing people, manufacturing engineers, salespeople - anyone connected to the project. Seeing all these stakeholders as users of research leads researchers to work with their immediate clients as either stakeholder representatives or collaborative informants.

Researchers who see their clients as full members of the dominant organizational culture treat clients’ assumptions, attitudes and goals as representative of other stakeholders that the project will need to influence. Treating clients as stakeholder representatives reinforces the perception of researchers as outsiders to the dominant organizational culture; researchers maintain an “us versus them” position and clients may not know that they are being analyzed.

Alternatively, researchers may treat their clients as collaborative informants, and explicitly ask clients to describe and diagnose their own organizational concerns. In this case, the clients act as peer collaborators rather than subjects. This approach can reinforce a shared, project-based team identity for clients and researchers - they are in it together - with other project stakeholders as the outside party.

The same research team can take both approaches in the same project, as relationships evolve over time. However, they have distinct implications for how researchers work to understand the users of their research. In working with clients as collaborative informants, some researchers see the feedback produced by “real time” (R-12) collaboration as obviating the need for stakeholder interviews or other specific client research activities. However, others will always push to conduct stakeholder interviews just to hear how decision-makers “think and talk about” the project (R-04), or to understand their values (R-13). The two different approaches also have implications for how researchers communicate with their clients. With collaborative informants, the goal may be to support mutual, frank disclosure of information as it develops, gearing the main deliverables to other stakeholders, while drawing on collaborative informants for guidance (IxD-01).

Now it’s a lot of back and forth about what they want us to stress, what they find interesting, some of it is about, “within this organization you can’t call it this, don’t refer to this in this way, everyone will think you mean this and then
they’ll have this three hour conversation with you because you’re calling it high-
deductible instead of consumer deductible.” – R-01

However, when communicating with stakeholder representatives, the strategy may be to
maintain a more polished, optimistic front and only bring in the clients when the deliverable
is presented. In these cases, the researchers may seek feedback on the form and wording of
the deliverables from others in the research group (R-03).

Learning about clients
To address the communication issues they face, researchers - particularly when the client
is treated as a representative focus on uncovering key themes in client and stakeholder
interactions: information needs, organizational and personal barriers, and cultural norms.

Identifying information needs
The researchers interviewed engaged in extensive activities to uncover and make explicit
clients’ expectations for the project’s ends and means.

That is to say, despite specifying documents such as RFPs (Requests For Proposals),
SOWs (Statements Of Work), and MOUs (Memorandums Of Understanding), researchers
usually begin projects by revisiting and re-establishing the goals for the research. They, as
one design engineer said, want to be sure they “aim the project correctly” (DE-03) to meet
the information needs of their client organization. They ask questions like:

- What research has already been conducted?
- What kind of information does the client want?
- What kind of information does the organization actually need?
- What business reasons motivate this research?

Answering these questions doesn’t just affect research design. It also affects communica-
tion practices. As one researcher told us:

I need to understand from them exactly what they want and that’s a whole
different research process and they don’t know that. But you need to, like,
actually change your way of working with that person because of it. – R-09

What R-09 means is that researchers can select from a repertoire of communication
strategies. Daily emails or weekly phone calls; lots of detail or high-level summaries: the
communication media and rhythms follow not just expressed client preference but heuristics
about what kind of communication practices will best support organizational goals. For
example, an “agile” software startup, with development cycles measured in days, will call for different patterns of communication than a hardware manufacturer on a three-year timeline.

Communication decisions also take place within the constraints of time and budget. Researchers want the client to “get it” - but need to “figure out the best way to communicate that to them given how much they’re actually paying and time they’ve told us to spend” (R-12). It is not just the goals of the project but those constraints of time and money, negotiated at the beginning of the project, that concretely affect the kinds of communication strategies that researchers will employ in the weeks and perhaps months to come.

Identifying organizational and personal barriers

Research communication strategies take shape within a web of complex roles and dependencies. As outsiders, researchers try to “suss out” power relationships and orientations to the specific project that might affect communication media and rhythm, as well as the rhetoric of the content:

Part of our work is to suss out who’s who and what are they going to bring to the process. Are they going to be champions for this; are they going to get in the way or have to be won over or whatever. So there’s kind of who hires us, and who are we working for, and who are we working with? – R-04

Researchers do not study the entirety of the organization. Rather, they are trying to discover orientations vis-à-vis a specific project. Relevant questions include:

- Who initiated the project? Who is paying for it?
- Who are we working for? Who has final decision-making authority?
- Who are we working with? Who are our peer collaborators?
- Who has a stake in the status quo? Which people will we have to convince?

By answering these questions, researchers are able to identify not only who has information needs, but also where inertia issues may crop up. To streamline dealing with issues of interpretation and inertia with senior personnel, design researchers learn from both collaborative informants and stakeholder representatives. Individual players with a stake in the status quo may need special attention to help them make the research insights actionable.

Identifying cultural norms

Whether outsiders or members of the client organization, researchers are not just concerned with the informational needs of the project or the roles and responsibilities of the people involved. They are also concerned with what Schein would call “organizational culture” - the shared values, assumptions, and expectations of their clients [124]. Their goal is to tailor
their own communication strategies to get around issues of both inertia and interpretation in order to increase the impact of the research on the end design.

In part, researchers want to avoid content that inadvertently generates unnecessary friction. Some words or phrases may be “land mines” (R-10), and provoke unpleasant and time-wasting refighting of previous organizational battles. Some analytic approaches may be unfamiliar or uncomfortable. One researcher often supplements her primarily qualitative findings with “quasi-quantitative” activities, such as small-scale web surveys, because a reliance on qualitative research took her clients “too outside of their comfort zone” (R-03).

Researchers’ understanding of organizational culture - and professional subcultures within it - can influence not just what is communicated but how it is communicated. One researcher revealed her perceptions of the differences between engineers and researchers:

I’d never have engineers do a collage exercise. They’d be like “That’s insane. We can’t, we don’t even know what you’re talking about. You know, we’re not cutting out pictures, what is this, preschool?” – R-03

As part of their understood role as “hired antagonists”, design researchers work to understand organizational culture in order to change it. One researcher described his job as figuring out the “truisms and expectations that this company has that you can push against” (R-10). Another, expressing a similar idea, considered what the client is “going to have to go through to get change implemented” in the design strategy (R-12). Communications that tackle inertia issues, in this case, might be a necessary and important part of a researchers’ job.

In engaging with organizational culture, researchers might ask:

- What topics are controversial? Why?
- What are my clients’ assumptions?
- What frames or metaphors do they use to describe their customers and markets?
- What might be obstructing change or progress?

The end goal is to deliver the message clearly and persuasively “in a way that the client will get it” (R-12) - whether that delivery is friction-free or deliberately provocative.

**Responding to inertia**

Three major tactics for researchers to combat inertia in companies are: creating actionable communications, socializing their findings, and fostering a sense of ownership in the clients they work with. These three tactics provide levers of control against the bias and resistance to changing thought worlds as illustrated in the extended meta-model of communication (Figure 3.3).
Designing Actionable Communications

After the research stage is over, researchers run the risk that their work may be seen as irrelevant, especially as organizational and departmental inertia come into play. To deal with these issues, design researchers often endeavor to make their deliverables immediately actionable while the information is still applicable to the project and the researchers are present.

Actionable research deliverables are tools for inspiring design. They “are not just descriptive,” said one designer who also conducts research (IxD-08) but “suggest opportunities.” For the researchers in this study, actionability did not imply dictating design directions. Instead, actionability meant supplying designers and engineers with the tools and skills to use research insights in their own design processes. These deliverables are neither descriptive analyses, which may be too abstract to be useful; nor prescriptive recommendations, which may leave designers and engineers feeling as if the researchers are claiming too much authority over the design process. An in-house researcher at an agile-based software company, R-05, found that without making the research actionable, his coworkers wouldn’t integrate it into their work.

I can produce as many slide decks as I like, but until I show you that it is valuable, it’s not going to do anything. At least here. Get some work out there that people can use and get value from. – R-05

Researchers may see themselves as “delivering an experience” rather than a list of specifications or insights (R-04), thus tapping into “experiential learning” to create momentum in a new direction. Participatory activities, such as brainstorms, get clients and stakeholders invested in turning research insights into action - or, as one researcher said, “making it into something that can be real for your company” (R-03). However, what constitutes “actionability” might change from organization to organization, depending on which clients and stakeholders are involved. So creating actionable communication hinges on researchers’ knowledge of the client organization.

Socializing the research

In conjunction with understanding their client’s company, researchers work to socialize the research throughout the client organization. To socialize research, as the name suggests, is to circulate research stories or documents widely, past any “gatekeeper” (R-04) clients to others in the organization. As a form of “relationship practice” [61], it is one tactic for extending the influence of research insights and reinforcing the research intent against the shifting of roles within a project. By sharing “bonding” experiences with primary clients - through field trips to meet end users, shared meals during data analysis sessions - research can be socialized. Indeed, successfully socializing research, can make “beautifully designed objects” less important than “the relationship aspect” (R-03).
The goal of socializing is to convince more people of the research’s relevancy to the organization, and to encourage a shift in thought worlds by expanding the shared system of meaning through sharing stories and experiences. “Humorous” or “outrageous” stories might be told and retold around an organization (R-04); anecdotes are easy to grasp, recall, and pass along. Rather than document requirements, they help people internalize perspectives other than their own through a streamlined and surrogate experience that might generate different requirements. Ironically, these internalized perspectives may support more durable and “stickier” research intent than documented research findings, as they evoke an emotional response. As design ethnographers Dawn Nafus and Ken Anderson write: “The object may itself be forgotten; the story persists.”

Creating ownership

Meeting users during field research, listening to stories, and helping in data analysis can get clients and stakeholders “invested emotionally” in the users at the heart of HCD. In turn, says one researcher, “They become kind of advocates for these people they heard” (R-10). Written between or after research activities, but before full data analysis, interim reports engage recipients in the research process and get them invested in the decisions that researchers are making. Emotional investment, in turn, can assist in socializing the research.

By including their clients and stakeholders in research activities, researchers are working to give members of the client organization a sense of ownership over the research itself. By owning the research, they become advocates for the users, as they tell the stories from the research as their own, essentially stepping into the shoes of the customer. As these people move to other teams and groups, they carry not just the research findings, but also the experience of discovering those insights. By providing experiences rather than solitary deliverables, researchers may hope to convince client organizations to go beyond accepting the research findings and move toward a customer-centric way of doing business.

4.4 An approach to client communication: the double ethnography

As this chapter has detailed, design researchers often approach communication with their clients and stakeholders as though it, too, were a HCD project. There are obvious parallels between the two situations. Both products and reports are intended to meet the specific needs of an external group, whether clients or end users. Upon release, a product leaves designers’ control, becoming open for users’ interpretations. Likewise, research results are also out of researchers’ control and open for interpretation by members of the client organization that use the research. Finally, both products and research results may be rejected. In response, researchers then craft not only a deliverable document, but an experience that can guide decision-makers in using the research to inform the design of the end product.
In the words of one research participant, effectively working with clients and stakeholders as users of research outcomes requires a “double ethnography.” The primary goal of the double ethnography is to help researchers figure out how to communicate across boundaries of expertise, culture, and interests. That is, researchers attempt to understand their audiences’ worldviews and integrate them into research communication at the same time that they are attempting to understand end users’ worldviews and integrate them into design recommendations.

Because professionals often use the term *ethnography* quite differently than trained scholars, the term has become controversial in the design research industry. However, the term *double ethnography* is used here because it evokes two key characteristics of the practice. First, ethnography involves the self-critical questioning of assumptions. Design researchers set themselves seriously to understand both the user and the client company culture. Second, it involves putting the results of inquiry to work by inscribing those understandings into how and what they communicate. As with a more conventional ethnographic practice, their work entwines empirical observation and the making of representations. This is not to suggest that the design researchers in this study are conducting anything like an academically rigorous ethnographic study of their client organization or that they should conduct such a study.

A double ethnography may begin by learning about the research project, the clients and their organization. Insights from informal conversations and stakeholder interviews modify the team’s expectations for their audiences’ needs and perspectives. After developing an initial understanding of the needs of clients and stakeholders, the research team begins to investigate users. The double ethnography continues at check-in meetings and when clients or stakeholders accompany researchers into the field. New insights from these interactions may again modify the research team’s understanding of client and stakeholder needs and perspectives, which may in turn affect ongoing design research activities. After completing the design research, the research team continues to engage with clients in producing the kinds of explanations, social events, documents, and tangible artifacts that will meet clients and stakeholders’ needs for actionable information considering their existing perspectives and biases. The role of persuasion and motivation to learn in the effectiveness of these communication pieces will be examined in the next chapter.

**Summary of techniques to address communication issues**

More concretely, this chapter proposes techniques for effectively communicating design research findings across organizational boundaries that draw on the communication practices of HCD researchers.

1. Investigate the research environment with a double ethnography approach
   - *Plan activities that will identify mechanistic information needs* throughout the project. The most sophisticated plan for overcoming issues of inertia and transla-
tion can fail if researchers do not understand where, when, and how their clients and stakeholders need communication.

- **Turn the ethnographic lens on the client organization.** What is the organizational culture? The hierarchy? Where might issues of translation or inertia crop up? What kinds of narratives and forms of information have the most credibility within the organization?

2. Focus on sites of inertia

- **Identify key decision-makers and their stakes in the status quo.** Use client and stakeholder research activities to identify biases, reservations, and sources of resistance.

- **Create ownership** by facilitating emotional and professional investment in the research process, especially by bringing clients or stakeholders along on research outings, and by using stories to create emotional impact.

3. Facilitate actionability and socialization by supplementing documents with experiential learning

- **Follow up document-focused presentations with experiential-focused ideation or brainstorming sessions.** Data-rich storytelling with photographs and video can also help make the deliverables “come to life,” sparking the audience’s imagination and building empathy.

- **Spend time with clients.** Bonding - and the accompanying translucency of work process - may sometimes serve the credibility of research better than hiding the details.
Chapter 5

Persuading and Motivating Designers

In trying to communicate and socialize their findings, researchers face a challenge: how to remain both outside and inside? One researcher (R-03) described this challenge as a “tug of war.” As outsiders to the client organization, researchers need to present their findings in a way that “resonates” with insiders and “reflects” their concerns. But in many cases, researchers want to be disruptive – to undermine assumptions and confront biases. They want to remain on the outside in order to identify organizational assumptions, but inside enough to do so in ways that are effective. This outside-inside distinction is traditionally referred to in anthropology as the distinction between “etic” and “emic” perspectives [127]. The difficulty for researchers is that, unlike anthropologists, they are often financially reliant on the very people they would like to challenge. Their future business survival may well depend on how well they communicate their etic perspectives in an emic way.

This dichotomy brings up an important question: should the researcher approach the work as an “objective” descriptive analysis or as a persuasive narrative in which the researcher takes a “point of view” based on his or her expertise (e.g., [77])? Design researchers who are not also designers will almost never be in the position of making the final design decisions. However, they may well see it as their special responsibility to speak for end customers, and make sure that their needs are considered. In essence, they must help the client organization transform information about the end users into actionable knowledge for new design directions, getting past the inertia of previously held ideas. In these cases, the researcher’s communication becomes not only informative, but persuasive.

This chapter examines the use of persuasive and motivational techniques to increase the impact design research has on the design process. The successful use of these techniques are dependent on the design research team’s successful engagement in a double ethnographic process in which it learns about the goals and biases of its clients. After examining the use of these tactics, the following analysis then reviews the persuasive and motivational aspects of the techniques design researchers use to disseminate their research findings: socializing the research, fostering a sense of ownership, and creating actionable research deliverables. The chapter ends by proposing some metrics for successful impact on the design process.
CHAPTER 5. PERSUADING AND MOTIVATING DESIGNERS

5.1 Methodology

Building on the literature on persuasion and motivation to learn, Chapter 3 developed a set of Principles of Persuasion and Motivation to Learn.

The Principles of Persuasion are based on those developed by Cialdini [31], who summarized the literature into the Principles Liking, Reciprocity, Social Proof, Consistency, Authority, and Scarcity. However, these all essentially provide cues to the audience to consider the argument favorably based on emotion (Pathos) or credibility (Ethos) of the source, but do not address the content of the argument itself; in other words, they assist low-cognition processing [27, 110]. To assist the high-cognition processing of the logic of an argument (Logos), the Principles Evidence and Reason are added.

The Principles of Motivation to Learn are based on the work of multiple researchers. Keller and Burkman [80] and Goslin [60] identified variables which inspire people to learn, Thomas [140] identified variables which motivate people to work, and Heath and Heath cite Heath:2008 identified variables that make information easy to remember, or “sticky”. Compiling these variables, Relevance, Challenge Level, Positive Outcomes, Variety, Surprise, Completion, and Trust emerge as Principles of Motivation to Learn.

Using these sets of Principles, twelve of the interviews analyzed in Chapter 4 were examined for instances of persuasive or motivational techniques. Interviews with design researchers who work in design and research consultancies, rather than those that work with internal clients, were chosen for this analysis because external researchers have a stronger and more persistent “outsider” status. However, it should be noted that both internal and external research groups face challenges in affecting the attitudes of designers and managers regarding their research.

The process of analysis followed a closed-coding methodology, in which a coding scheme is developed – in this case, based on the Principles of Persuasion and Motivation to Learn – and the interview data is then coded line-by-line using those pre-determined codes. In this case, closed coding was appropriate because the analysis was looking specifically for instances of the techniques identified as being persuasive and/or motivational. The following sections briefly summarize the overall results, and then analyze each code set individually.

5.2 Results

Tables 5.1 and 5.2 summarize the codes, their characteristics discussed above, their sub-codes and how often the codes were applied. The Motivational Principle Trust can be seen as a composite of the Persuasive Principles Authority, Reciprocity and Evidence, so to prevent double coding, Trust is dropped in favor of coding its constituent parts. Also note that, though Relevance is listed under the codes for Motivation, it is an important component of both Motivation and Persuasion as discussed in the previous chapters. In total, including sub-codes, 51 codes were applied over 1100 times to 401 excerpts. Removing instances where
### Table 5.1: Codes for Persuasion

<table>
<thead>
<tr>
<th>Code</th>
<th>Appeal</th>
<th>Type of Processing</th>
<th>Subcodes</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liking</td>
<td>Pathos</td>
<td>Low-cognition</td>
<td>Similarity, Praise</td>
<td>28</td>
</tr>
<tr>
<td>Consistency</td>
<td>Pathos</td>
<td>Low-cognition</td>
<td>Explicit, Public, Voluntary, Anticipated Interactions</td>
<td>33</td>
</tr>
<tr>
<td>Reciprocity</td>
<td>Pathos</td>
<td>Low-cognition</td>
<td>Social obligation, Trust-building actions</td>
<td>19</td>
</tr>
<tr>
<td>Scarcity</td>
<td>Pathos</td>
<td>Low-cognition</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Social Proof</td>
<td>Ethos</td>
<td>Low-cognition</td>
<td>Number of sources, similarity of sources</td>
<td>35</td>
</tr>
<tr>
<td>Authority</td>
<td>Ethos</td>
<td>Low and High-cognition</td>
<td>Power, Expertise</td>
<td>50</td>
</tr>
<tr>
<td>Evidence</td>
<td>Logos</td>
<td>High-cognition</td>
<td>Quantitative, Qualitative, Multiple sources, Personal Experiences, Unprocessed Data</td>
<td>114</td>
</tr>
<tr>
<td>Reason</td>
<td>Logos</td>
<td>High-cognition</td>
<td>Argument structure, Position discrepancy, Presenting both sides</td>
<td>29</td>
</tr>
</tbody>
</table>

### Table 5.2: Codes for Motivation

<table>
<thead>
<tr>
<th>Code</th>
<th>Depends on</th>
<th>Subcodes</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevance</td>
<td>Understanding the audience</td>
<td>Connect to goals and outlook, Concreteness, Choice</td>
<td>141</td>
</tr>
<tr>
<td>Challenge Level</td>
<td>Understanding the audience</td>
<td>Start simple, Provide roadmap, Clarity, Active involvement in creation, Diminish distractions</td>
<td>104</td>
</tr>
<tr>
<td>Positive Outcomes</td>
<td>Understanding the audience</td>
<td>Meaningfulness, Competence, Extrinsic Motivation</td>
<td>57</td>
</tr>
<tr>
<td>Surprise</td>
<td>Human nature</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Variety</td>
<td>Human nature</td>
<td>Multiple Channels, Multiple Messages, Novelty</td>
<td>70</td>
</tr>
<tr>
<td>Completion</td>
<td>Human nature</td>
<td>Rhetorical questions, Ambiguity, Drama</td>
<td>34</td>
</tr>
</tbody>
</table>
two sub-codes were applied to the same excerpt leaves 747 applications of the 14 Principles of Persuasion and Motivation to Learn.

The highest frequency Principles were Relevance, Challenge Level, and Evidence. Persuasion resulting from high-cognition information processing usually leads to internalization, resulting in longer more stable change \([27, 110]\). Because the success of design research is partially based on whether it results in changes in attitudes and knowledge that last the duration of the design process – sometimes on the order of years – design researchers would be expected to rely more heavily on relevant evidence. Challenge Level has to do with customizing the communication to the abilities and prior knowledge of the audience, which helps them more easily process the information, while keeping them engaged.

The lowest frequency Principles were Scarcity, and Surprise. It may be that design researchers saw evoking the Principle of Scarcity as somewhat manipulative, or that it doesn’t lend itself well to the information they are presenting. However, Reciprocity is a critical component of trust building, so it is unexpected that they do not mention more instances of reciprocal behavior. Surprise is a part of being provocative, which the analysis in Chapter 4 found was often a goal of design researchers who wanted to create large impact in their client organizations, making it an also unexpectedly underutilized Principle.

In the next sections, each Principle is analyzed individually in order to understand their role in design research communication and propose some possible reasons for these results.

5.3 Persuasion in Design

Persuasion plays two roles in design research, even after selling the client on a design research project. The first is in getting clients to engage in the design research process – attending interviews, participating in data analysis, and helping to craft deliverables or develop concepts – and the second is in the presentation of design research findings. Design researchers draw on Principles of Persuasion to accomplish both.

Liking

The Principle of Liking, which states that one is inclined to listen more closely to those one likes or considers similar to oneself \([31]\), can play a large role in getting new ideas accepted. As a low-cognition emotional appeal, this principle is especially applicable when people are not sure how to judge an idea with logic and reason alone. For example, in the Alcoa/Coca-Cola story in Chapter 1, Point Forward had trouble convincing the US branch of Coca-Cola to adopt the FridgePack packaging concept. In this case, the ethnography hadn’t been done for Coca-Cola, but for one of its packaging suppliers, Alcoa, so the research team didn’t have a relationship with the people at Coca-Cola. The team thus couldn’t figure out how to sell the packaging to the US branch, which was convinced that packaging changes wouldn’t affect sales. However, one of the people at Alcoa knew someone at the Australian branch of Coca-Cola.
So they had no interest. We couldn’t budge those guys, because we fundamentally
didn’t understand that. We thought by showing [the US branch] the logic of our
ethnography and its relationship, they’d get it. So, what happened is, one of
the people at [our client] had a buddy working in [the company in] Australia –
just total serendipity, he just happened to have a buddy there. And they were
talking, and he got this guy to go run an experiment – let’s run a line of these
in Australia, and it was like, yeah, let’s do it! [...] And they got a sales bump,
within two months they had a sales bump, a significant one. It was like, “it
works! It’s cool!” It was then the US seeing Australia [that got the US branch
to adopt the FridgePack]. – Michael Barry, Principal, Point Forward

In this example, it was the relationship with the Australian branch, more than the logic
of the ethnography that helped sell the new idea. Because of the bond of friendship the
Australian had with the Alcoa employee, he was willing to take a risk on the new packaging,
which ultimately turned out to be a major success. This shows how an emotional bond can
be beneficial when one is trying to “shake the client up” (R-03). As R-13 put it, “the ideas
coming out of that after, like, six months of doing this work, are really like tiny seedlings
of ideas, so they’re really immature so that’s why we need to almost create this emotional
bond first” (R-13).

To create that bond, researchers bring their clients out into the field to spend time with
them: “You’d rather do [the fieldwork] with one or two people, but you lose that opportunity
there to make connections with the company” (R-10). They structure a number of other
activities beyond the actual user interviews to, based around what’s going on for the project.
This extra, “extracurricular”, time can create close ties between design researchers and the
clients they work with:

The intensity of some of the things that happen out in the field and even outside
the interview, you just establish friendships with people. [...] I really do become
friends with my good clients. I have a lot of good friends that have come out of
those business relationships. – R-03

The dinners, the meals, the “tourist activities” are all structured around what’s
going on for the project. Because it’s so intimate, we’ve had a couple instances
where people are like, “you’re my best friend!” It’s like, “oh no! I’m not!”
– R-10

However, if design researchers become too close to their clients, they can lose their pro-
fessional objectivity:

We should have known those people well enough, those team members, to be
able to convince them of a good way to do it, of a better way to do it. We were
too close, and ended up accepting a lot of things that didn’t work as well as they
should have. That’s our fault. That’s client management, too. We didn’t have the technique to have them at the right place. – R-10

Balancing these bonding experiences is necessary to keep enough distance to be objective about the project and how to present it in a convincing manner.

As mentioned earlier, in some cases, “beautifully designed objects” may be less important than “the relationship aspect.” However, artifacts still do play a role, and the Principle of Liking can refer to the feelings of clients toward the deliverables, not just the researchers presenting them. Many researchers work to make their presentations beautiful (e.g., R-03; R-12), which makes it more pleasant to sit through, but also more convincing:

An ugly report is not something that people are compelled to read. And so, I don’t want to call it a pretty report, but a visually compelling and intriguing report, usually makes it more interesting to read and easier to read if the information hierarchy is stronger, or the supporting visuals are better. – R-14

This is also important because a well-designed report or presentation will help designers to identify the presenters as “more like them”, i.e., as someone with the ability to design.

Consistency

The Principle of Consistency is related to the concept of cognitive dissonance, as people experience cognitive dissonance when they act inconsistently with their beliefs or self-perceptions [11]. To avoid the discomfort of cognitive dissonance, people want to be consistent with the image they project to others and to themselves. As with the Principle of Liking, design researchers invoke this Principle by getting their clients involved in the research process early on – when a statement or action is made publicly and voluntarily, the need to stay consistent may increase until it forms a commitment [31]. If clients see themselves as voluntarily participating in the process even to a small degree, they may become committed to the research or the research project.

My client, my immediate client contact, I established a relationship with her. You know, we did field work together, she trusts me, I think she’s great, and she’s becoming more and more involved in the project. You know, she’s reading transcripts - she doesn’t have to do that. I’m also reading the transcripts and doing the analysis, she’s not doing it because she’s sitting here and it’s expected, she’s doing it because she wants to cause she loves this project. So that’s a really good sign. – R-03

By having their clients work with them to shape and direct the insights, design researchers are getting their clients engaged in the research project and invested in carrying through the project directions determined by the research. Once clients see themselves as committed to a project, they may voluntarily become more deeply involved with the research.
In ideation workshops following the presentation of findings, design researchers will incorporate activities that use the Principle of Consistency, to help increase the chance that clients will use the design research findings to inform future design decisions. They will have workshop participants pick and pitch their favorite ideas (R-02, R-14) – this is essentially a public, voluntary announcement that they believe those ideas are worth pursuing. The researchers facilitating the workshop will guide the workshop participants in connecting the ideas back to the needs identified, and then have everyone vote on which concept they believe was the best for the target users.

You’re walking away short of who’s going to exactly do what and how for when, but you do hopefully have agreed, you don’t just agree this is what the research found, but you agree this is what we can do about it and what we will do about it. The gap becomes then when it gets back to the company what’s the follow through on that? – R-14

By pitching and defending their ideas, the workshop participants are not only agreeing on what needs to be done, but also internalizing the reasons behind those agreements. The researchers will then arm their collaborative informants with research results that they can present to others in the organization.

Even though we’ve sort of put it together in one story, I think our clients take the parts that are most relevant to them and kind of move them through the organization in different ways. So I think as soon as our clients get our stuff, they’re honing in on the three or four slides they want to show their boss or they want to use as like, currency within their organization to say, like, “I’ll give you some of our information but I want to be involved in the project that you’re doing.” – R-13

However, clients may perceive a risk in being seen as being committed to or associated with an unpopular idea that comes out of the research.

Remember I said sometimes you want to be provocative? Well, a lot of times people in companies hate to be provocative – you can be provocative because you don’t have to show up there. – R-10

It’s important for design researchers to balance the needs of their collaborative informants not to be seen as “too provocative” and the needs of the client to be “shaken up” so innovative things can happen.

Reciprocity

Reciprocity is another low-cognition emotional approach to persuasion. As mentioned earlier, Cialdini suggests modeling the behavior you seek, whether it’s a sense of trust, a spirit
of cooperation, or open consideration of the others’ viewpoint [31]. Trust and trustworthiness are built on aspects of this principle through sharing experiences, mutual disclosure, and demonstrating non-exploitation of vulnerability [Meyerson:1996]. As design researchers gather information about their clients, they demonstrate that they care about their clients by being non-judgmental (R-13) and working with them to make sure the research meets their goals and needs.

To do research you have to have empathy for the people that you talk with, and demonstrate that you really care, and I think that you have to do that for your client as well. Not that you have to, or “oh, it’s in a line item: express empathy for your client” but I think it’s just naturally part of the personality of the kinds of people that do this work. – R-03

This builds up trust and a sense of open consideration. At the same time, by expressing empathy for both their clients and their users, researchers are modeling the behavior they hope to see in their clients. They then bring their clients into the field to meet the users. Proximity increases one’s perception of others’ similarity to oneself, and more acutely triggers one’s mirror neurons,¹ which develops empathy [57]. At the same time, interviewees are put in a vulnerable position by allowing researchers and their clients to come into their homes and discuss the intimate details of their lives. This demonstration of trust inspires a reciprocal sense of responsibility in most people who see themselves as being trustworthy, building on the Principle of Consistency. By attending the research interviews, clients thus incur a social obligation to the interviewees they meet, in addition to developing any sense of empathy that comes from hearing people share their problems.

You need to hear other people talk about the problem in their own words, ‘cause that’s the only way you build up that empathy, otherwise it’s very difficult to get that transferred on to you. – R-15

Design researchers also evoke the Principle of Reciprocity by giving their clients gifts. Unlike fundraisers who create a sense of obligation by including little gifts such as necklace charms or address labels in their mailings, design researchers are less obvious. They will sometimes put the research or findings on items of value.

For big clients, we’d give them an iPod with all that stuff on it. ¡laugh¡ Keep the iPod! I mean, for $200 it’s not that much and it’s a nice, really nice kind of parting gift with all the data on it.” – R-03

By gifting the iPod to her clients, whether consciously realizing it or not, R-03 was evoking good will towards her and the research by creating a social obligation. However, most of the references to the Reciprocity Principle involved building trust, rather than creating social obligations.

¹Mirror neurons are neurons that fire both when one performs an action and when one watches another person perform the same action, essentially “mirroring” the actions of the other [115].
CHAPTER 5. PERSUADING AND MOTIVATING DESIGNERS

Trust-building for idea generation

To facilitate good brainstorming in their workshops, design researchers will first work to help people build up trust with each other by doing low-risk, non-relevant tasks, such as cooking, so they learn to share ideas openly with this group of people. Then, when everyone is more relaxed and less fearful of sharing their ideas, the group can conduct the important work of coming up with new ideas for identified opportunity areas.

For a lot of corporations, this seems like a boondoggle. “Oh my god, we’re going to spend the afternoon doing some cooking exercise together?” Like, “what’s that about, shouldn’t we be working on the chip technology?” Trust me, that cooking activity is going to pay dividends tomorrow. – R-10

Sometimes, building up good will and trust is as simple as letting clients share the ideas they’ve been thinking about for some time:

A lot of our clients come into this stuff with preconceived ideas that they’ve been thinking about for this quarter, or the last 30 years, so it’s good to give them a chance to write those down and put them on a board. It’s almost like “we hear you, put it on the board, that’s great, now let’s focus over here on this.”

– R-13

Allowing their clients to share ideas without being shot down, not only lets the clients refocus on the process, but it creates good will by validating their ideas as a contribution to the process.

Scarcity

The Principle of Scarcity states that the less people can have, the more they want 3, and manifests at two points in the design research process: when going out into the field, and when identifying opportunity areas to explore.

The first situation manifests as a sense of exclusivity around attending the interviews and taking part in the research process. This gets people curious to know what the research process is, and can be a first step into getting the clients involved in the research voluntarily, evoking the Principle of Consistency:

Other people came too, but they came on one interview, and that’s all. Just to get a sense of what the research is about. It was just for these other groups in the client company to understand what was going on in this research and how it could be beneficial.

– R-01

Research of this kind is fairly novel at most organizations. In addition, most of the time people are barred from seeing the intimate details of strangers’ lives. Going on an interview
provides an opportunity to look into, not only strangers’ lives, but strangers whose lives the clients may have an effect upon.

However, the principle of scarcity acts more strongly in the second sense – the idea that there are limited opportunities, and you can “miss” them. Essentially, if the researcher is able to identify an opportunity area, and the client does not act on it, there is the possibility that another organization will discover and take advantage of that opportunity:

Maybe there is a startup working on something that you’re telling some giant company that they need to get on top of: “Look, it’s coming, here’s some evidence of that” that’s another great way to also inspire ideation, but also to prove your point. – R-03

A combination of these two aspects of the Scarcity Principle can lead non-researchers that have been on interviews to start to think, “if I’m not there, we might miss something that only I would see” (DE-03). It’s not clear why design researchers did not mention activities that evoke this Principle more often, but it may be that they do not feel comfortable increasing the perception of scarcity in a way they see as artificial, and so only use the Principle when it presents itself naturally, which doesn’t warrant as much discussion.

Social Proof

Social proof is the principle that people will take the opinions and actions of others around them as cues for their own opinions and actions [31]. It is a low-cognition way of adding to one’s credibility. Design researchers evoke this principle when getting clients to participate in the research process or attend the presentations on the research results – as design research has become more well known, people are interested in finding out more about it:

Clients are really interested in seeing what this magical “design research” process is all about, you know, because design and innovation are the buzzwords in all the magazines. – R-08

After bringing clients out into the field with them, design researchers will rely on their collaborative informants [117] to vouch for and promote the research findings, going so far as to consider them “allies” (R-03). As members of the client organization, collaborative informants can also identify the key stakeholders that should be exposed to both the research results and the research process:

Part of what they’re doing with us is creating an event, they’re creating an opportunity to not just create new ideas, but demonstrate the research process itself and get as many people as possible introduced to that. – R-02

If the researchers are able to convince these stakeholders of the validity of the research, it will be easier to convince the rest of the organization as well. A key part of this is bringing
these other stakeholders on fieldwork outings, the intensity of which tends to deeply affect them:

But at the end of the day, our ability to affect change is much bigger. The multiplier is huge by having them there. [...] So we kind of both transform them – they may start really cynical, but they’re going to come back kind of changed, and these initially cynical marketing people will come back into a company and go “guys, you guys really need to listen to this person” and we can’t say that with the weight they can say it.

– R-10

Collaborative informants not only assist with and vouch for the research, but also work to socialize it throughout the organization by sending the research results around; this is facilitated by the researchers creating deliverables that are easily distributed such as video snippets (R-10, R-13).

Social Proof can sometimes work against the aims of design researchers, however, when social taboos or judgments undermine the value placed on the opinions of the interviewees.

It’s really tough when you’re dealing with these very intimate things to allow it to be nonjudgmental. So how do I keep the judgmental stuff out of this discussion, as opposed to allowing it to be “well now that we’re off the clock, let me tell you what I really think about blah blah blah”? That doesn’t help. I think that’s a tough one because we’ve opened it up into this world of very, well it’s entertainment in a prurient way, and yet to my mind it can really undermine the value of some of the work. So it’s keeping that balance.

– R-10

Judgment distances clients from interviewees emotionally, which allows the clients to more easily dismiss interviewees’ opinions and needs. Unfortunately, bringing clients into the field means not being able to screen out those aspects of the interview process that may inadvertently backfire. Although use of extreme users may give the design team insights, they may not serve as explicit personas or examples. For example, one design research team interviewed prostitutes as “lead users” for a product category that plays a role in sex, but is used widely by the general population. Because of the conservative nature of the client, quotes and stories from those interviews were not included in the research results, even though the interviews informed the findings. Instead, the researchers built their presentation with quotes from interviews with more “acceptable” sources (R-10).

**Authority: Expertise and power**

Authority is a combination of credibility through expertise and through the use of power. Design researchers draw on both aspects. Design researchers work to establish their status as the experts in uncovering user needs and insights. They may show their work by presenting their findings against a backdrop of the walls they covered with Post-Its during hours of
analysis (e.g., R-01). Or they may hide their work and announce only their confident conclusions, hiding any evidence of false starts or uncertainty. Alternately, they may advertise their company’s proven methods and years of experience in the field.

As with any consultancy selling its work, design research consultancies have standard slide decks and case studies they show to potential clients (R-15). To support the credibility of their findings, design researchers will again repeat these credentials when they present their findings (R-14). Researchers also work to make sure that their presentations and deliverables are highly polished to bolster their professional image as experts in the field. They talk about how the presentation and report need to be “perfectly polished” and “serious looking” (R-03). In a way, this makes up for a growing trend not to deliver long reports that won’t get read:

A lot of projects these days don’t include a report. They might include a brainstorm session with us, or bulleted out lists, or sketches, or cartoons, or something other than a research report that feels substantial, like you paid $20K for it. So that’s one of the reasons they have to look so good. We’re not handing you a book. It’s like yeah, I got this from serious professionals and it’s ten pages and it’s really pithy. – R-12

Another way that design researchers work to appear more “expert” and “serious” is to choreograph certain interactions with their clients.

But for large teams, who aren’t used to ambiguity or aren’t used to messiness, analysis can be really scary for them. Sometimes when clients want to be involved, we kind of set something up where it’s almost like a working session, but it’s a little bit – it can be a little bit fabricated sometimes where we set things up and like, we talk about themes, or we give them an exercise and they come and we talk about it or something. – R-13

Design researchers, as outsiders, generally do not hold professional power over their clients. They work to meet the client’s needs only as long as the client wishes to retain their services. However, researchers will draw on the power of the contract to get their clients more deeply involved in the process by including a clause that stipulates the client team will have the time to be involved (R-04, R-13):

We like to set up the project where we have our main client and maybe a core team of people that will participate and we have a commitment from their organization that they have time. It’s not a side thing that they’re doing but it’s actually part of what they’re getting measured on that year – R-13

By working this kind of wording into their client agreements, researchers are able to get their clients to come spend time with them in the field. This lays the foundation for a number of the other principles of persuasion to be applied – such as making time for
bonding between researcher and client, the clients meeting and connecting with users, and gathering information on the needs, views, and assumptions of the client organization. Design researchers also use video, quotes, and other forms of evidence to draw on the inherent authority of the end user to speak about themselves.

Logical Arguments: Evidence and reason

Because evidence and reason are tightly coupled, they are considered here together. As the most prominent Principle of Persuasion, it is evident that even as researchers work to build relationships of trust with their collaborative informants, they must still work to convince the rest of the organization of the validity of their work. Endorsements by collaborative informants help, but primarily, design researchers rely on “evidence” to support their claims so that the influence will have a lasting impact [111]. This evidence comes in the form of quotes, photos, stories or artifacts created by interviewees for the sake of the research, such as diary studies. However, there is nothing more powerful than first-hand experience, which is often what convinces the collaborative informants to make an endorsement in the first place. Researchers repeatedly told stories of clients that had been “transformed” by going out on field visits with users:

At the end of the project one of them said to me, “you know, I really didn’t know why I was going out into the field. But now that we’ve done this presentation,” he was like “I totally get it. Because if I had just seen this presentation without having been there, I wouldn’t have really...” What he was trying to say was he felt like the passion or the energy behind the design. He knew what to design because of what he’d seen, right? Which I thought was just amazing. He’s like “I’m designing something totally different than I would have if I wasn’t out there.” –R-03

Design researchers recognize that bringing people out into the field allows them to replace preconceived notions and “internal defaults” with “a direct pipeline to people in real circumstances” (R-02). The effect is great enough that they are willing to bring their clients into the field even if it means the quality of the research is negatively affected by their presence (R-04). When design researchers cannot bring their clients into the field for some reason, they often rely on video to make their point:

If you can show video of five people saying, ‘what brand? I’ve never heard of that.’ Or, ‘Oh yeah, they’re...’ I actually had somebody, for one brand I was working on, they said, “oh, that’s like the salvation army of this product.” So you get some statements like that that are unprovoked, and nobody in the room can argue with that. –R-03

In their presentations, design researchers will shift between abstract research findings and insights, and detailed examples of collected data such as video clips. They then “walk” their
clients through the logical connections between the two. Design researchers who deliver just the research will start with the main opportunity or insight and work backwards to the data that supports it:

> Probably the best thing PowerPoints are is to say, here’s an opportunity and analytically here’s how it connects back to all the stuff we set up as important, right, these are the linkages. There’s no blink response, there isn’t that emotional sense of this is right, but it’s very good for, “now that I kind of believe you, give me the analytic case to show how all these things connect.” “Ok, this is informing why I have this gut sense that this is a good idea.” — R-10

In these over-the-wall situations, where a different team will develop the resulting new concepts, being “antagonists” (R-03) is important to get design research clients to rethink their current viewpoints and internalize the research results. Though presenting a drastically different viewpoint is important for creating the maximal change in their clients, these researchers are careful not to “go too far because you’ll lose them completely” (R-10).

> If you make a statement about what you saw out in the field, it may be upsetting to somebody in the room. And certainly, I’ve had a lot of people say, ‘I just don’t believe what you’re saying. I don’t believe that you saw that out in the field.’ ‘Well, you don’t have to believe me, but it is what I saw out in the field.’ — R-03

On the other hand, researchers at design consultancies often present research as a means of justifying a design direction they will later develop, and work instead to bring the client along without any surprises:

> We’ll start the synthesis step for them and say, so we saw these patterns here and here and here and I’ve created some of these insights and then we’ll go through those insights and how they link back, and then from those insights we can usually get into, from these insights, if this is your criteria for your product, here’s how we’ve prioritized this criteria, because here’s the things that you really have to do that are most resonant to your consumers, they’re more resonant with your brand and most resonant with your process. — R-08

By the time the researchers are presenting their proposed solution, the client is already going to know what that solution will be.

**Quasi-Quantitative Evidence**

Though design research is often deeply qualitative in nature, design researchers recognize that business decisions must be based on more than the opinions of a small group of people. However, they also believe in their process, and will work to support their findings through other means.
In [the] analysis [phase], we try to pull in other factors that start to support that small group of people because as you move higher up in the ranks and as ideas become more and more real, inevitably someone is like “why are we basing this whole new business on 18 people?” – R-13

Design researchers have a number of strategies for supporting their findings in more quantitative ways, which adds credence to their arguments. One tactic is to include a longer report or appendix that details the raw data in more depth than can be presented in the one- to two-hour presentations of findings (R-03). They may also display the amount of data they gathered as they present their findings. For example, one design research team “brought the client into the room with butcher paper all over the walls” that had been covered in relevant photos and color-coded sticky notes (R-01). The junior researcher that related this story lamented that the “saddest part is they didn’t get up to look at anything!” What she didn’t realize, but which more senior design researchers do, is that the display of this large amount of data is not necessarily for the audience to process, so much as it is to support the legitimacy of the conclusions by showing evidence of the process and the data gathered (DE-03, R-15). Other researchers will place all the data, as it is gathered, on a website that the client can access (R-12), or present the client with a hard drive of the un-curated data after the end of the project (R-15).

Another tactic is to take the qualitative research and use it to develop a quantitative tool that can be used to start to “build a real case for this idea as it becomes more of a reality” (R-13). This might mean including quantitative or quasi-quantitative data in the presentation itself.

Something I have done in the past is supplement the qualitative research with some quasi-quantitative research. If you have some bold findings that you know people are going to question – not believe, not act on because it’s just too outside of their comfort zone – if you can do a web survey with 100 people that is backing that up, it’s not necessarily statistically significant or anything like that, but you can say, “yeah, we talked to eight people and this is a really important theme. Also, we did a little additional research that backs this up.” So now it’s giving it a little more credibility. – R-03

Not all design researchers, particularly those from non-engineering disciplines, are comfortable working with quantitative data, but they recognize the importance of becoming so. This is even more the case as their work has begun to include interpreting quantitative research results that clients have collected on their own or with the help of quantitative market research consultancies (R-10, R-15, R-02).
5.4 Motivation to Learn Design Research Results

This section examines how design researchers draw on the Principles of Motivation to inspire their clients to engage with and use design research findings.

Relevance

As mentioned previously, presenting information and arguments in a way that makes them relevant to the audience is dependent on an understanding of what is important to the audience [80, 97, 111]. Chapter 4 has already examined how design researchers turn their ethnographic lens on their clients in a double ethnographic process. This section, instead, will talk about how design researchers use that information to build actionable deliverables through an iterative design process.

Iteration

Design researchers see the crafting of their deliverables and presentations as “a design process” in its own right (R-02). As with any design process, they start with something very rough and then iterate toward a final solution:

Your story feels like it’s on squares, you know, and it’s just like any product design, the first prototype you wanna make is with rubber bands and cardboard, not foam or SLS or whatever. You want to just have some little dinky thing you can feel free to mess with, a piece of clay or something. And then once you feel pretty good about it, you’ve got some parameters around it then you can start carving it out of foam and see what that looks like and how that feels and then move forward. – R-03

The communication of research results does not only need to truthfully convey information about users and customers, but it also has to “mean something to people, it has to have emotional impact, and it has to be logical and make sense” (R-03). Many consultancies that deliver design research have specialized roles for supporting the design of deliverables and formal presentations. They may be called translators, envisioners, or simply visual designers (R-13, R-14), and they bring a “stronger sense of visual communication, graphic design to the table, to make it as clear and compelling and as memorable as it can be” (R-14).

Design researchers recognize that when one is crafting a communication deliverable, it can be difficult to tell if it conveys all that it is meant to, in the way that it is meant to [82]. To improve the effectiveness of their communications, design researchers will test iterations with people less familiar with the research, whether there are specialists available for consultation or not:

Somebody with a completely outside perspective is really helpful, too. [...] When you have a bigger company that’s easier: tell a story, “What do you think?” It
just gets better and better the more you can do that. The more different people, smart people, that look at it the better off you’re going to be. – R-03

However, to keep the communication fully relevant to the client, the opinion and input of the client is paramount. After all, “data and insights can take many frameworks, but they aren’t all necessarily meaningful or actionable to our audience, the clients” (R-14). Clients working with design researchers are looking to invest in innovative projects, but fulfilling this goal may be blocked by their perceptions of reality. Design researchers need to start from the perceptions of their client and then help them to move to a new perspective.

The client has become successful because they have a specific view that isn’t working anymore. If I understand what that view is and find an alternative one, I can open up new ground. If all I do is replicate that view, I give them nothing, so I really need to understand that view well in order to find an alternative to push against it. – R-10

By working closely with their collaborative informants, design researchers avoid many pitfalls, in both the way they say things (R-01), and even in the visual models they use:

Even visual structures – I have one client who, everything they communicate is in a 2x2, which is both good and bad. So knowing that, it’s actually great if you can communicate in that, but if you can’t we don’t even try to come close to it, because they get real confused real fast. – R-14

Balancing client needs

The analysis in Chapter 4 shows that the iterative process of understanding the client begins with the first client meetings and stakeholder interviews and continues throughout the research process as initial impressions are sent and interim reports are given. It culminates in the iterative design of the final deliverables and presentations discussed here. Throughout the process, design researchers work to balance the needs of the client and the client’s customers, and the story they craft must reflect both sides of the equation.

It’s really a marriage of what came out strongest in the research, what really moved you, and what the goals of the, the business goals of the project are. So, where the perfect storm is of those two things, those have to be the strongest part of the story. – R-03

The result of this iterative process has to strongly convey the synthesized insights of the design research, while also connecting strongly to the client’s points of view, without getting “mushy” and overworked (R-10).
Challenge Level

The challenge level of new information is determined by the prior knowledge of the audience, and the support that the presenter provides to the audience in making connections between that prior knowledge and the new information [60, 60, 72].

Simplicity and Clarity

A key part of supporting people in internalizing new information is in simplifying and clarifying the information to be processed [66]. Design researchers value keeping things as simple and visual as possible (R-13). However, design researchers must first figure out how to translate an experience into something they can pass on to another person:

That’s the challenge of having an experiential change when you do this fieldwork and then having to impart the big finds from that to someone else who hasn’t had the full experience. – R-02

After sharing with each other what they think is important, they go through a process of “boiling it down to the essentials” (R-13), “just distilling it and distilling it and distilling it to the points that would be inspiring to ideation” (R-03). But this “boiled down” version must be both clear and simple to be useful (R-10), while still explaining how the conclusions were reached in order to be credible (R-15). To do this in the short time frames they have to present their findings, design researchers need to be creative and clever to support their clients’ understanding of their insights (R-10). They use metaphors and visual models to clearly illustrate insights (R-01) and build a shared understanding with their clients by working with them to prioritize the insights for the projects going forward (R-14). Simplified models are seen as more actionable, because they are easier to grasp by clients:

Which kind of creates an interesting conflict in that it doesn’t always mean it’s the clearest way to present the information, or maybe the richest way, but if the client can’t act on that or understand something, it’s no good. I would never want to get caught calling it, like dumbing it down sometimes, but if the client won’t fully understand or make use of it, then you haven’t fully done your job. – R-14

However, some researchers have seen their work misused or misunderstood when a simplification stands in for reality. These researchers worry that they will make the models too simple and too easy to remember, and their clients will forget about the complexity behind them:

We gotta make simplifications, it doesn’t work any other way. But you can’t believe that your simplification is the reality. It’s so easy to fall into the trap that this little model I built is the be-all-end-all, and, right, “it’s the Rosetta Stone of all knowledge you need to have” is total nonsense. – R-10
CHAPTER 5. PERSUADING AND MOTIVATING DESIGNERS

Giving the presentation

Besides iterating to craft intriguing and relevant presentations with clear and simple content, design researchers will watch for clues that their clients have internalized the information as they present, checking that their presentation is evoking the desired outcome and increasing their understanding of their clients:

Are they fired up, did they immediately start using my language? Did they immediately seem like they are building that empathy with the consumer that I want?

– R-14

The questions clients ask give design researchers a chance to clarify and reframe misunderstandings (R-02), but the researchers must be very familiar with the research and have supporting evidence at the ready (R-03). The presentations are important elements in getting buy-in throughout the organization, as they add credibility to the research that gets sent around. Design researchers approach the presentations as a type of performance.

Those presentations are theatrical events that are really important to anchoring the ideas. And when I say theater, it’s that classic, you bring people together, you darken the room, you do all that stuff that we’ve come to know as theater to say “something important is going to be shared here” so there’s those types of events.

– R-10

The theatrical setting of the research presentation helps to diminish distractions for the audience, a key element to reducing the challenge level. The design researchers will then walk their clients through their findings, working to make sure that they only surprise their clients enough to be provocative, and no more. In most cases, they will forewarn their clients of the content:

I think we’ve just been really rigorous about, either using text or a quick voice over to set up the scene and then just being really disciplined in how we edit things so that it’s a short kind of blip and then maybe another frame that says, like, this is what you just saw. So, it’s really more spoon feeding, I think.

– R-13

The iterative process of designing communication deliverables discussed in the section on the Principle of Relevance also acts as a type of forewarning for more collaborative clients, while allowing design researchers to tune their presentation to the sensibilities of the organization.
CHAPTER 5. PERSUADING AND MOTIVATING DESIGNERS

Positive Outcomes

People are more motivated to learn about a subject if they perceive a high likelihood of positive outcomes from doing so \[80\]. In many cases, this may mean the satisfaction of extrinsic motivators, such as a good review or the possibility of earning a design reward. However, the extent to which design researchers have control over extrinsic motivators was discussed in the section on Authority. This section looks instead at the two internal motivators: gaining a sense of competence, and a sense that one’s actions are meaningful, which both are factors in motivating people not only to learn, but to apply that learning in their work \[140\].

Competence through applying new knowledge

A key way to help people gain a sense of competence is to help them to apply the new knowledge or skills they have gained \[80\]. This also helps them to internalize the new knowledge and skills within their existing knowledge world before the design researchers pass off the project.

In their presentations, design researchers will sometimes guide their clients in coming to the conclusions, rather than lay them out for them:

This sounds really creepy, but sometimes we’re trying to make, we’re setting up the connections, but ideally the client is making some of the connections so they’re feeling like they’re owning things a little bit. So sometimes we’ll have a framework in our back pocket that we think we might get to in the end, but what we’re trying to do is to sort of steer things so the clients can do that on their own and feel like they’ve accomplished something. – R-13

This can be done through the use of rhetorical questions, as discussed in the section on the Principle of Completion. Researchers also facilitate the use of the research in workshops, designed to get their clients to “wrestle” with the new concepts. R-10 explains, “you can’t just present it as an abstraction; they’ve got to work it, with a real problem. And we kind of need to be there to help them to figure out, how do you work it?” This guided working is very similar to hands-on learning environments, where the instructor is more of a facilitator than a lecturer:

The corollary of being a good interviewer, is being a good group facilitator. Feeling the room, knowing how to get someone involved if they’re not involved, how much or how little of your own ideas to put into it. Do you take the paper and draw on the paper for the group or do you remind them “don’t forget to document it...” and walk away? – R-02

The whole process gets clients “out of their normal everyday mindset, exposes them to the research and gets them to do something with it” (R-03), with the goal of coating the room in ideas and to give people a chance to take the insights, think about them, and develop ideas with them in mind (R-02).
Meaningfulness through emotional connection

Thomas found that many people are intrinsically motivated by knowing that their work is meaningful. These people will go out of their way if they know in their heart it is the right thing to do, which can be a result of participating in a design research process:

I’ve had three projects make it because of people that have had that attitude: “let them fire me, I know this is the right thing to do.” That’s uncommon, but it’s that cavalier sense of “I feel so strongly about this that you can threaten my job and I don’t care – I’m going to do it anyway.” Like, wow. I mean that’s a funny thing our success has been based on those kinds of people, by and large.

– R-10

However, design researchers don’t fully understand how to inspire this kind of commitment. Many design researchers see the work they do to understand where meaning arises in people’s lives as being deeply meaningful, even if it is simply used to create new products. They also believe that “designers want to be emotionally linked to what it is they see, to get engaged” (R-10). So, they work to communicate in “a really emotional and compelling way. So clients and stakeholders will believe in it and feel it, and want to be an advocate of it” (R-13).

One tactic they’ve found is to forecast the potential impact of a suggested concept:

One really fun one we did was with photographs and captions, and talk about how this concept of ours would change somebody’s life. Just in their everyday life, not in a fundamentally moving way, but just how it would be: a day in the life of somebody with this concept.

– R-03

Showing how the concept adds to the world, even in a small way, gives the concept some purpose, and thus the design work also has purpose. Another tactic is to help their clients develop a sense of empathy for the customer, by bringing their clients into the field, and by sharing richly in their presentations. Design researchers have found that “clients become emotionally invested in the people they meet” (R-08). DE-03, a design engineer explains:

There is something you get from being at an interview, being able to ask your own questions and kind of being forced to have that time to really think about a person’s situation that you don’t get as much from reading a transcript of it.

– DE-03

By developing a sense of empathy for the people they meet and sympathizing with the problems they face, designers are more emotionally invested in solving those problems. To share richly, design researchers have turned increasingly to video snippets to invoke a hyperreality, essentially creating an illusion portraying the details of real users’ lives:
I’m sure you’ve been to a wedding, and then you see the video of the wedding afterwards, and you discover in a month or so the only things that you remember are what were in the video, not your own experience. So in that sense, the video is an interesting framing device. – R-10

Although watching video has a greater potential to trigger mirror neurons than viewing photographs and reading quotes, some design researchers rely on “a combination of still photography and having us give lively presentations and telling the story ourselves in our own words, and what it was like to be in Adeline’s house” (R-08).

Variety and Novelty

Variety helps to keep people interested in the problem by staving off boredom and satiation [49]. In the context of communication, mixing up messages, using multiple mediums, and introducing novel stimulus can satisfy the audience’s need for variety.

Variety of messages

Given the depth of their research into consumer behavior and motivation, design researchers generally have too much information to convey rather than too little. Rather than work to make sure they touch on different points, they work to make sure they tell a cohesive story from the work they have. They often have to leave out some insights that “don’t fit into the story” (R-10).

As you go through and you’re refining the deck and refining the deck and they don’t find a home. It’s like if you go into your closet and you haven’t worn it for years you throw it out. If it doesn’t find a home, it’s not really connected to anything, and that becomes a heuristic, let’s just throw that out. It was cool when we talked about it on the whiteboard, but we’ve moved our story so much since then that we can kind of cut that out. R-04

Often, “honing [the whole story] down into a story you can tell in an hour and a half is extremely challenging” (R-03). Telling a complex story in a short time requires making judicious choices about what points emphasize, making sure not to be so provocative that the audience is lost (R-10). For bigger changes, such as getting a company based on disposables to move toward sustainability, researchers will work over multiple projects to affect small changes:

If we said that too strongly, and too powerfully, the senior executives would go “what about seven times a day don’t you get?” So we’re walking them, we’re taking baby steps toward that other position. I know that’s the position they need to be. I know this. I can’t get them there. They’re this Queen Mary, right? So every project, every time, I’m moving them a little bit. But you can’t be a drudge, you can’t be seen as “that’s your agenda.” – R-10
Multiple mediums

Every design researcher in this study discussed using multiple mediums to convey their messages to their clients. At the minimum, this means using a mix of imagery and text, including stories and quotes (R-14). However, it can range from informal half-page descriptions of interviewees (R-10) and headline descriptions (R-04), to full immersions (R-14) and animated videos (R-13). As R-15 said:

There’s a huge variety of ways you can think of ending, visualizing your research and giving it to a client that makes the most impact on the organization. It really comes down to what you think the client is going to find the most use in. – R-15

Design researchers not only pick mediums based on the client, but also use a variety of mediums within a single project to support the different learning needs of the people who may be in the audience:

Like any kind of teaching, you need to address people’s different cognitive and learning styles. Remind yourself that really what it is, is a learning situation: you’re imparting the research on somebody else. So you have to have a balance of approaches and not assume that everyone understands information the same way that you do. – R-02

This variety also staves of satiety for any one medium, helping to keep the audience’s attention for longer. R-10 has had one client tell him, “our executives have the attention span of six year olds, not smart six year olds,” and he approaches the design of deliverables with that in mind. Design researchers see their techniques to entertain their audience as a way to motivate them to participate in “the hard work of a PowerPoint or a workshop” (R-10). To make a deeper impact, design researchers are often looking for new and novel ways to communicate. They look both for ways that better convey research insights, and that better maintain their audience’s attention. For example, the standards for video in the last ten years have gone up, especially as people have gotten used to seeing everything in video form on sites such as YouTube. Video has gone from something novel that people watch just because it is there, to something that has to be intrinsically entertaining to maintain people’s rapidly shortening attention spans (R-10, R-13).

Completion

The Principle of Completion draws on people’s “desire for the end” or for an answer to an open question [17]. Design researchers employ the Principle of Completion by posing questions and crafting narratives.
Rhetorical questions

Using rhetorical questions and “not quite finished” ideas in design research presentations forces audience members to anticipate the answers based on their own experiences. When the aim is to be provocative, this can set the audience up for a surprising reveal. In other cases, this will help create a sense of co-creation or ownership in the audience members. R-13 explains, “if you leave some gaps in the story for people, they start to fill them in with their own experience or their own ideas and then they start to get excited about the general idea.” As a member of a design consultancy that does design research, R-13 will also present concepts. They leave these concepts fairly ambiguous so that people will not focus on the details, and instead engage in developing the idea:  

And it’s a lot of times it is more low-fidelity, in fact, like there is that whole paradox of, like, not showing too much so. The lower the fidelity in a lot of cases, the more engaged people get because they feel like it’s a sketch on a napkin and not something that’s already done that they need to defend against. – R-13

Other design researchers use this to guide clients in the transition from listening to and processing research results to using them to create new ideas by asking questions such as “how might we...?” (R-10) or “how can we...?” (R-02):

You’re starting to point in the direction of solutions or improvements, or new concepts all together, business models or whatever. So that’s kind of inspiring for everybody, but then when you switch to ideation you have to change the way you talk about those statements. So now it’s not just like “we could do this, we would recommend this” to “ok, how do we do that?” – R-03

Choreographed Drama

Design researchers also use ambiguity and drama to draw in their audience and maintain their attention. Some design researches see their presentations as “choreographed” (DE-03, R-13) and “theatrical” (R-10).

These formal meetings, and that’s how I’d characterize them: that they’re choreographed. So we have control over what’s happening with the slides. The presenter is standing and speaking, and we’re paying attention to pacing, and you know a lot of slides are in there that have to do with emotional connection and narrative. – DE-03

Others see their presentations more as educational (R-02) or as a straightforward “journey” (R-08, R-09), however, by crafting a dramatic “story”, design researchers can draw on the characteristics of narrative tension to enthral their audience. Narrative tension is grounded in the Principle of Completion – as narrative “frames” are opened, ambiguity about
the resolution of each frame sustains an audience’s interest as they anticipate the closure of
the frame. A classic example is the “smoking gun” – once a gun is introduced into a story,
the audience knows it will be used in some way, and is simply waiting to see how. In design
research presentations, frames are created as the design researchers list out the objectives of
the project (how will they be met?), introduce new interviewees (what is their relationship
to the topic?), and introduce new synthesized insights (what is the evidence to support this
insight?).

**Surprise**

Surprise is a key aspect of provocation. Surprise drives one to learn more about a subject to
diminish the cognitive dissonance brought up by the difference between what one believes and
what one has just learnt [81]. In addition, because of the involuntary attention a surprising
stimulus evokes, people remember surprising facts and images better [99]. Through surprise
and challenge, design researchers convince their clients to reconsider their assumptions and
reframe how they conceptualize the lives of their customers. However, surprise plays a different
role depending on the end goal of the project, which may be why it was the least mentioned
Principle of Motivation to Learn. When the project is focused on conveying research insights
to a design team that will take those insights and develop new products, surprise is an
important tool for getting them to remember and internalize the research findings. On the
other hand, when the project will end with a concept or finalized product idea before the
client team takes over, as it often does with design research consultancies, surprise is not as
useful.

Researchers at a design consultancy were concerned that, even though surprise can be
powerful, it can also be distracting:

> We definitely want to get people’s attention, we want people to kind of stand
> up and notice what we’re talking about, but I think when you do that, there
> are different ways to do that, and surprise is one of them, but surprise can also
> create distraction. Or surprise can hide things that you probably should be
talking about or distract from those things. – R-08

For design researchers in a design consultancy, the presentation of findings was more
about making the design process more transparent and logical to their clients. Where they
looked to create an impact was in justifying and promoting the final concepts, rather than
the insights. As one researcher at a design consultancy said, “we typically don’t do a big
production formatting of the research because typically our clients aren’t buying research
from us, they’re buying the strategy” (R-13).

Research consultancies are working to transform not only the strategy and product of-
ferings, but also to shift the fundamental understanding of the customer in order to affect
strategies going forward. Researchers from these firms focus more on helping the design
and management teams they present to internalize the research findings. They’ve found this
requires them to be antagonists who shake things up in a provocative way, and draw on surprise to do this.

These ideas are provocative in some ways for them because they’re some of the stuff they think they’re already doing, but it’s not coming through to the consumer so that, you know, it’s gonna be surprising to them.  – R-03

They then back up these surprising and provocative statements with qualitative data from their research, and help the design teams to use their new understanding in idea generation workshops.

5.5 Influencing Inertia

The three major tactics researchers use to combat inertia in companies, socializing their findings, creating actionable communications, and fostering a sense of ownership in the clients they work with, are all effective because of their inherently persuasive and motivational aspects. All three aspects use concrete Evidence and Reason, because the communications of design researchers are built on the quotes and stories of real customers.

Socialization of the research findings is motivated by the Variety, Novelty and Surprisingness of the stories and deliverables that design researchers present, which spurs the sharing of these stories with others in the organization and increases their likelihood of being remembered. Once shared, the stories’ credibility is bolstered because of the Social Proof they gain by being seen as relevant and interesting by others in the company, while already pulling on the Authority of being created by professional researchers.

Actionability draws on the Motivational Principles of Relevance, Challenge level, and Positive Outcomes to support and inspire designers to apply the insights from design research to new designs. The Persuasive Principle of Consistency then kicks in to increase the likelihood that designers will continue to pursue the ideas they developed and possibly defended in facilitated idea generation workshops.

Fostering a sense of ownership draws on a combination of Positive Outcomes, Liking and Consistency. Personal investment and a sense of meaning are created by meeting users, aiding in data analysis and then applying insights to create products that better meet these users needs. By working with the actionable deliverables to apply design research insights, designers internalize the findings as a part of their own knowledge world.

Metrics for Successful Impact

Researchers who are not affiliated with their client organizations often have difficulty monitoring the effects of their efforts. Their clients in engineering, management, or marketing may be working on timelines that are months and years longer than the actual research engagement. When a product finally comes to market, the influence of their long-ago research on its design may not always be clear. However, researchers use a set of informal measures to
evaluate their own work. Just as market penetration is one measure of the success of a prod-
uct, researchers similarly estimate the extent to which the client organization adopts their
research. This section proposes four metrics that working design researchers use to determine
whether they were successful at creating an impact within their client organizations.

**Metric 1: Adoption**

Researchers look for clues in the short term to know if they have begun to socialize the
research. They hope that members of the client organization will retell research stories,
or copy slides from research deliverables to their own presentation decks. In particular,
adoption success comes from demonstrations of actionability: when a client uses the story
within participatory design exercises such as brainstorms (R-03). In the longer term, design
researchers will look for strategy and product changes that align with the research insights,
though these indicators may be less clear.

**Metric 2: Circulation**

Research insights may be embodied in videos, visual models, slide decks, or other artifacts.
The circulation of these artifacts, or portions of them, from one team to another is another
measure of the deliverable’s impact. Design researchers will deliberately design artifacts to
be shared and forwarded. They then listen for evidence that these artifacts have been shared
between teams, and even multiple projects.

**Metric 3: Durability**

Stories and models can circulate from team to team. But researchers also look for evidence
that stories, frameworks, or insights still influence decisions in their original client team long
after the research engagement. As one researcher (R-04) recalls,

> I can think of a project from before I had this company, where there was a model
not something like this that just blew their minds. Just totally gave them a
different way to think and talk with their customer. I heard a story that it sat
there for a long time. That was a really, really important model for how they
thought and they’d refer back to it... They’d tell us stories about it for years and
years and years. – R-04

In this case, the success of the deliverable lay in the aha moment that it created – a
moment that so strongly affected the people involved that it had a half-life of years.

**Metric 4: Repeat Engagements**

As with any consulting firm, the true measure of success is whether or not they are engaged
for another project.
The next chapter examines successful communication events to reveal strategies for embodying the Principles of Persuasion and Motivation to Learn in actionable research deliverables.
Chapter 6

Actionable Research Deliverables

This chapter further explores current techniques in communicating user-focused design research to stakeholders outside the research group. In particular, this chapter looks at how the strategies explored in previous chapters are manifested in actionable research deliverables. It begins with a review of techniques from design research literature on deliverable forms. Then three case studies are presented, each exploring a unique project and the techniques used to convey empathy and understanding. Though different formats have different affordances and limitations, the case studies in the next sections show that there are some techniques that can be used across media: the use of analogy and metaphor to convey concepts holistically, authentic quotes and stories, guidance on processing or using the research, and surprise and novelty.

6.1 Describing Deliverables

In reviewing the literature on techniques for conveying user insights, several dimensions along which approaches differ start to emerge: prescriptive vs. descriptive, tangible vs. virtual, thick and thin description, presentational vs. experiential. Each of these dimensions is shown in Figure 6.1, along with representative examples.

Note that some communication formats, such as video, may show up on different ends of a spectrum based on content and configuration. For example, video clips may be Presentational, while edited video narratives are more Experiential.

Prescriptive vs. Descriptive: This dimension addresses the question of how much researchers should tell designers what to design [42]. Prescriptive communication suggests actions to be taken, often in the form of a guideline or imperative. In some cases, a sample concept or idea will be suggested, or a metaphor to guide the development of other concepts. For example, a suggestion of making a website that is “Flickr [54] for video” points to creating something like video-sharing site YouTube [152]. Descriptive communication stays one step back and allows the audience to come up with its own implications. This may involve presenting more raw data and abstract models, possibly also using metaphors, but only to
help describe what is, rather than what “should” be. For example, a design research team for an electronic textbook project described educational content in a textbook as “food in a meal,” where the publishers are the chefs and the professors order for the students. Though this describes the situation, it doesn’t suggest what to do about it [71].

As mentioned in Chapter 4, being too prescriptive may diminish the design team’s sense of ownership over the prescribed design direction, lowering their motivation to pursue it. On the other hand, being too descriptive, i.e., presenting only raw data and no conclusions, can leave the audience without the ability to make sense of what it’s seen, or know how to work with it moving forward. Where on this continuum a deliverable lies will depend on the goals of the project and the individual philosophy the researcher has about his or her role in the design team.

**Tangible vs. Virtual:** Tangible communication techniques make use of constructed artifacts to convey user insights. The first case in this chapter presents an example from the tangible end of this spectrum: an interactive museum-like exhibit. At the other end of the spectrum are virtual artifacts, such as videos of various formats, such as short YouTube-like snippets [34] that tell user stories. The second and third cases are examples of the virtual end of the spectrum: a documentary video and a series of short online videos. In the middle are items that display characteristics of both, for example, strategic imperatives which are attached to the client team’s security badges, insuring that they’d be seen each day [73]. The badges are tangible artifacts, though the imperatives are conveyed verbally.

Tangible artifacts may be more effective because they are novel, omni-present, or offer multiple information channels. For example, the security badges will consistently remind the client team about the imperatives. However, tangible artifacts do not lend themselves to deep socialization of the research – for example, the security badge attachments were only given to the immediate client team, and would not be passed around the company so they only support socialization to the extent that others outside the client team inquire.
about them. In contrast, a digital video or presentation is easily sent via email to others in the company, lowering the barriers to sharing, especially if the video or presentation is self-contained and engaging.

**Detailed vs. Abstract:** How much detail is put into the communication is another way to look at different communication techniques. Detailed communications are rich and aim to thoroughly represent the world. For example, Erickson suggests developing a lingua franca, or pattern language [46], for each research project. The lingua franca would describe the people, spaces, interactions, and relationships of each investigated setting, then be made available to designers as reference. An abstract communication may be just as informative, but with less explicit detail; for example, it may use a metaphor, analogy, or model to describe a situation [71].

Detailed communication may be useful in situations where the design team has the time and motivation to process all the information or revisit the research continuously over time. However, this endeavor may be too overwhelming or time-consuming to be useful in some situations, and is much less likely to be fully processed by decision-makers who often want a more abstract understanding. In many cases, the most useful strategy will be to incorporate both extremes, with the main variable being what the ratio is between detail and abstraction.

**Presentational vs. Experiential:** This dimension addresses the amount of interaction the audience has with the deliverable. Presentational forms of communication can be said to be a form of broadcasted information, with very little interaction, if any. Traditional lecture-style presentations and written reports are examples of presentational formats, though the use of rhetorical questions can sometimes add an element of passive interaction. Experiential forms of communication, on the other hand, are defined by their highly interactive aspects. For example, some researchers will role-play representational users, allowing the audience to “meet” and interact with them in character [133]. Another example from R-14 involved decorating a room in the spirit of a potential consumer group: “So you had objects at your table, and you ate the lunch, everything was supposed to reinforce who this person was. Again, to try to create immersion.” Interestingly, though not physically interactive, narratives can be quite experiential, whether written or filmed – readers and viewers get absorbed in the narrative and identify with the characters and their actions.

Presentational formats are more traditional and are expected by many clients. They can add an air of seriousness and formality. However, experiential formats, by their nature, are often more engaging, which can help to keep the audience’s attention. Again, a combination of the two may be the best path forward for many projects: a presentation or report helps to build credibility and meet expectations, while an interactive workshop may help designers begin to work with the research data presented.

**Combining dimensions:** In many cases, good communication requires incorporating aspects of both ends of each of these spectrums. Individual deliverables may lie on one or another end of each of these dimensions, but by combining deliverable formats in one communication event researchers can span each dimension. For example, many firms create slide decks as their final research deliverable, since it is a conventional and expected tool of business communication. They will then incorporate pictures and quotes to tell powerful
CHAPTER 6. ACTIONABLE RESEARCH DELIVERABLES

stories, models to help simplify the data, embedded video snippets to give it credibility, or follow it by an experiential workshop. By combining techniques, they span multiple dimensions.

The following sections look closely at three successful cases of design research communication, with a goal of identifying useful techniques and strategies. Each of these cases combine techniques that span the deliverable dimensions. For example, the first case combines embodied insights, interactive games, audio clips, visual models, analogies, quotes and stories, constituting seven of the eight dimensions.

6.2 Case study: Kaiser’s Exploratorium

Based in Oakland, California, Kaiser Permanente is currently the largest health maintenance organization (HMO) in the US. It is a working partnership of two distinct groups: the Kaiser Foundation Health Plan and Hospitals; and the autonomous regional Permanente Medical Groups. The Kaiser Foundation offers prepaid health plans and insurance, while also providing the Hospitals with infrastructure and funding. The Permanente Medical Groups are physician-owned organizations, which provide and arrange for medical care for Kaiser Foundation Health Plan members. Though the Kaiser Foundation is non-profit, the Permanente Medical Groups are for-profit, though they receive nearly all of their funding through reimbursements from the Kaiser Foundation Health Plans. As an HMO, Kaiser strives to provide health and wellness care as efficiently and effectively as possible, and has set up internal groups to devise better systems, tools, and services to that end.

The Innovation Consultancy (IC), one such internal group, acts as a design consultancy for Kaiser Permanente, using human-centered methods to develop solutions to the complex challenges Kaiser faces in providing healthcare. The IC was founded in 2003 after Kaiser worked with IDEO to learn about human-centered design. Since its foundation, the members of the IC have been exploring and refining their innovation methods.

Over the years, the IC has helped to devise new solutions to problems with healthcare delivery in the hospitals and clinics such as smooth shift-changes and accurate medication administration. The process IC members use has them walking the floors of hospitals talking with and observing nurses, doctors, patients, and staff. They take their observations and turn them into opportunity areas, which they use to inspire concepts for new services, systems, and tools. Many of the IC’s design concepts are born in co-design workshops where the IC involves people from outside their core team, including project sponsors, care providers, and patients. After testing the concepts in the field and refining them, many get deployed throughout Kaiser’s vast network of hospitals and clinics.

Background on the project

In January of 2011, the leadership of Kaiser Permanente approached the IC to do a special project to improve one of the key metrics it measures its success by. Though Kaiser had
invested a lot of money in new equipment, programs, and initiatives, there hadn’t been as much improvement on the metric as was expected. Kaiser’s leadership realized that further improvement would require systemic change across the organization, built on an understanding of the underlying causes behind the lack of improvement. The task for the IC was to find out what was working, what wasn’t working, and why.

This was a different project than most of those that the IC takes on – rather than coming up with an end product or service innovation, they were being asked simply to understand the situation and then to share their insights with the company’s leadership. Though they often presented some level of design research findings in the co-design workshops, those insights only had to spur ideas, they didn’t have to change minds past the workshop itself – generally the final solutions were what the IC was judged on by the rest of the organization. Chris McCarthy, an Innovation Specialist in the IC and Project Manager for the project, saw it as a great match for the IC’s interests and skills: the work would have repercussions beyond the borders of Kaiser Permanente, and at the same time it was a very difficult problem that wasn’t responding sufficiently to the regular solutions – a prime target for an alternative approach.

The project was made more challenging than usual because of the fact that leadership was not asking for an innovation, but for help in defining the problem. Traditionally, the IC had focused on innovating products and services for the Kaiser membership; this time they were being asked to use their techniques of understanding to explore the major hurdles and barriers to improving a particular industry metric. And their findings needed to have a lasting impact without being developed into a solution that could bring the issues to life for those not directly involved in the project.

It was really validating because it felt like leadership really was getting the value that we could provide, that it’s not just coming up with a new system, but it’s really understanding the challenges of the organization. So that was really surprising - you want us to help you understand. What was tricky was, would the rest of the organization really understand what we were up to? Could we actually sell, market that we were taking on this big initiative to provide insight and understanding and although we drank the juice, though we fully believed that this was deeply valuable and deeply important, we were not exactly confident the rest of the organization would get that. – Chris, project lead

As they thought about what this project could be, they realized they wanted to do more than pass off insights in a document, which only provides a solitary and possibly exclusionary experience. In most projects, the goal of the insight document was to help inspire design ideas, and tended to be lower fidelity because the people who would read it would have been involved in the research. In this case, the insights would be presented in a “one shot deal”, to people who didn’t have the benefit of going along on the research. The IC didn’t want to chance ambiguity, and felt there was a better way than a printed report or PowerPoint presentation.
How often when you read something, you’re like “wow, that’s amazing” and tomorrow you’ve forgot[t]en about it, it’s just not there anymore. So we wanted to figure out a way, can we design a way for people to feel the insight, even more important, can we design it in a way that creates empathy?

– Chris, project lead

The IC aimed instead to create an experience around the insights so leaders and staff could do more than just read, building on the concept that people learn through more varied ways, and that reading does not always provide the most experiential impact.

**Evolution of the Exploratorium**

Inspired by the Science Museum in Boston the consultancy set out to create an interactive exhibition, what they called an Exploratorium after the San Francisco museum, that illustrated their insights in a way that was easily understood and engaging. They figured if a science museum could help a three year old internalize complex concepts such as the refraction of light, they could use some of the same techniques to convey the complex perspectives of the people of Kaiser Permanente.

The IC needed to first convince their potential clients that an experiential deliverable would be the best way to go, so it “started socializing this approach”. Because of the importance of the work, its clients agreed. The IC then approached this project as though it were any other design project, and used the same methods it would use to prototype solutions, but instead brainstormed and prototyped what insights would look and feel like.

To help its audience connect to the insights and gain empathy, the goal of the IC was to create experiences that gave the sense of what it was like to deal with these issues on a daily basis.

We were excited that we got this brand new challenge and brand new way of using Design Thinking, but then at the same time, holy crap, we’re going to have to really, really push our thinking on what prototyping can do, and how we’re going to twist that into synthesis.

– Chris, project lead

As Mary Katica, one of the designers on the team said, “The idea with the Exploratorium and prototyping insights was that it was a little bit more playful and less serious, but still able to convey...serious stories and insights.” For example, Figure 6.2 shows how IC points out in their report the fact that what people say and what they think don’t always match up. Figure 6.3 illustrates this same point, but in a more poignant way – the figures swivel around to show the individual’s true feelings and thoughts. The ability to touch and move the figures to reveal their thoughts brings an element of play, while the disharmony between the two sides builds a story that’s concrete and surprising.

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1Design Thinking is a term commonly used to refer to human-centered design
Figure 6.2: A page from a report explaining the Innovation Consultancy’s design research process illustrates how what people say/do is different than what they think/feel.

Figure 6.3: These figures swiveled 360° to reveal incongruent thoughts.
To create systemic change, the IC needed to be able to say things about what was not working and have people from all over the organization hear them in a way that would not only be accepted, but spur positive action. To make sure the insights presented were accessible to all the people involved, the IC worked closely with representatives from management and staff to iterate on the wording and presentation of the insights – offending someone could lead to the listener disregarding what was being said, as negative emotions are one of the biggest demotivaters [32]. The IC used the two representatives as sounding boards, sharing initial insights, stories, and prototypes to make sure they were on board with all the experiences that would be provided in the end. At the same time, IC members wanted to make sure the messages were strong enough to have an impact.

We could have very easily just watered this down into the most uninspiring set of insights. But I think because we’re a strong team and we’re absolutely grounded in where this research came from, what we needed from our leaders was to help us craft how these sensitive topics could be digested and not trigger the immune response of the system. – Chris, project lead

By testing and iterating on their insight prototypes, the IC not only balanced impact with their audience’s viewpoints, but also were able to validate the effectiveness of their communications. People often overestimate the effectiveness of what they say, assuming that their intentions are transparent to others [82]. The IC avoided this tendency not only by bringing in the two representatives from management and staff, but by testing many of their insight prototypes with other people from outside of their team unfamiliar with the work to make sure that the message was clearly communicated.

The final Exploratorium presented the IC’s work as five meta-insights, which each encapsulated several sub-insights. The IC picked sub-insights based on which would help illustrate the whole insight category while being effectively experienced in this format. There were a lot of ideas that never made it to the exhibition either because they were passed over in favor of a better embodiment, or because the initial concept turned out to be more complicated to realize than expected. For example, to illustrate an insight about building relationships to increase team performance, the IC planned to do an elaborate immersive video-taped dinner showing people with different organizational roles getting to know one another – a reference to “breaking bread together”. When the team ran into trouble writing the script and working out the mechanics so it wouldn’t be “hokey”, it decided to simplify the concept to a table where Exploratorium goers would sit together and ask each other scripted questions over food, for example ”Where did you grow up?” This also meant that rather than watching others build relationships, the audience could participate directly. The takeaway around them was that to improve this metric, there needs to be conversation and personal connection across levels and functions within the organization. The staged dinner conversation provided an example of how personal connections happen, and then launched conversations about how those connections could be built in the workplace. One team that had attended
Figure 6.4: This diagram shows the layout of three of the five tables.

the exhibition took the insight that "dinner table conversation promotes good teamwork" and later held their own team meeting at the table to take advantage of the game.

Techniques in the Exploratorium

Each of the five meta-insights had its own table, each of which had three activity stations that each illustrated a sub-insight, except one table. This table, which focused on building relationships to increase team performance, had only one activity. The tables were arranged in a long row, with the main insights printed on dividers between the tables to help guide the audience’s attention. Each table had at least one individual and one group activity, providing different levels of social interaction. Three of the five tables are shown in Figure 6.4. Chris commented on the configuration of the tables:

The plus of what we did, was that it became this “everyone got to break bread together,” so everybody gathered around the table and got to experience things, but what was missing from that was a deeper intimacy. So I could see, if certain exhibits were set aside in different places, people could gather around those exhibits and not have all this other stuff happening around them. So they could have focused and not been distracted by other things. – Chris, project lead

One of the designers on the team, Mary, noted that she would like to continue to offer a mix of solitary and group experiences in future co-design workshops to enable a different emotional experience for their co-designers, especially for the introverts in the audience.

The Exploratorium drew on a number of techniques to help the audience grasp the insights being presented. These techniques, listed below, include emotional analogies, analogous problem-solution sets, question-answer games, user stories and quotes, and providing guidance through the exhibit.
Emotional analogies

To help the audience understand the feelings that came up for their research participants, the Exploratorium offered analogous emotional experiences. Instead of telling the audience that participants felt a particular way, the experience illustrated how those emotions were a natural outcome of the situation in a concrete and authoritative way [30, 66]. The experiences could thus spur conversations about the sources of particular emotions, while helping the audience to “get out of the sensitivity of the work”. For example, the management at Kaiser had been keeping track of how long each team had been meeting a particular goal – one that was sure not to be met if someone on the team made a number of common mistakes which could only be addressed if they were first reported. However, knowing when a mistake had been made was based on the self-reporting of the team members, who were understandably reluctant to tell anyone that they had broken the streak of success. Rather than simply saying, “people don’t want to be the one to break a streak of success”, the IC helped people to understand the pressure to not make a mistake by having people play a giant game of Jenga (Figure 6.5). Jenga is a game where each player takes a block from the lower portion of a stacked tower and places it on the top. The goal is to do so without knocking the tower over – a goal that gets harder with every move, thus increasing the pressure on the next player. The IC could then ask the audience members to consider how this paralleled the increasing pressure not to make a mistake that would break an increasing record of success, helping to explain why some mistakes were being taken care of quietly rather than being reported to management.

Analogous problem-solution sets

The consultancy presented analogous solutions to inspire thinking about a better solution for a current problem. The introduction of analogous solutions to a given problem type is a technique often used by design teams and in design courses, e.g., [90]. The IC used this technique to ask “how might we make certain processes shorter and more streamlined?” and made it interactive by providing blocks people could write on and move around to explore alternative processes.

The analogies came from outside the healthcare industry to help decouple the insight from the example. For example, one analogy compared Netflix’s streamlined customer experience, which has three steps to streaming a movie online, to going to a classic video rental store, which has seven steps before you can watch the movie at home. Pulling from outside the domain was a conscious choice based on experiences teaching the design process to new designers – when presented with an analogy from within their own domain, such as healthcare, they would focus on the example presented rather than learn from the analogy as a way to inspire new possibilities. This reflects research done by others on design-by-analogy [90].
Surprising answers

At some stations, audience members were asked to ponder a question, or match questions to answers. Then the answer could be “revealed” by lifting a flap or pulling a tab. These rhetorical questions were used to help uncover assumptions and misconceptions, and were used more often for factually-based insights. Figure 6.6 shows an audience member reading the revealed answer. While the question cues the audience on what to pay attention to, the “surprise” of getting a wrong answer helps to create a learning moment \[153\]. Some of these games had an inherent “scoring system”, such as a matching game where people would match percentages to learning modes. These kinds of scoring systems can add an extrinsically motivating outcome to an interaction \[80\].

User stories and quotes

As in many presentations of research findings, the Exploratorium included examples of direct quotes from the people that had been interviewed and/or observed. These examples, pre-
Figure 6.6: The interaction depicted here, where the audience considers a question and pulls up a panel to reveal the correct answer, could be experienced solo or in a group presented at “listening stations” – essentially headphones hooked up to repeating iPod playlists (Figure 6.7) – helped to make the insights richer by providing detail, and more credible by providing direct evidence. One listening station played songs chosen by research participants as exemplifying the hurdles and barriers they were facing, or illustrating what success would sound like, rather than direct quotes, again bringing in the use of metaphor and analogy.

At Kaiser’s Exploratorium, all the recordings were presented with audio only. This helped to keep research participants anonymous when they might be hesitant to have their views identified by others in the organization. In cases where the research participants and the audience are not coworkers video could also be possible. However, listening to audio alone provided a qualitatively more intimate experience because the quotes were listened to individually through headphones, with the voices of the individuals essentially speaking directly into the listener’s ear.

Stories and drawings from research participants were placed on banners around the room, connecting to and expanding on the insights illustrated by the activity stations. As with the quotes provided in the listening stations, these provided examples which help provide authenticity and richness to the insights. As a backdrop to the Exploratorium itself, these stories illustrated the context from which the insights were drawn.

All the audio clips, stories, and drawings were made up of original material from interview
sessions. By presenting recordings of people telling their own unscripted stories and honestly reacting to the questions and statements of the interviewers, the presented materials gain an aura of authenticity which add to their credibility as evidence. These materials also helped to increase the relevancy of the findings by echoing familiar places and situations in concrete ways.

Guidance

Guided tours of the Exploratorium lead by the design team helped the audience engage and explore the insights. This was possible in the first two exhibitions, when the design team observed a deep level of interaction with each of the stations. In the third exhibition, the design team was on hand, but a larger audience and a more casual setting (the Exploratorium was set out during the evening reception of a conference) meant that audience members spent less time at each table, and didn’t necessarily go through all the stations. However, placards for each station asked key questions and guided interaction with the activity for those who approached, as shown in Figure 6.8. The questions were designed to guide the audience members in making a connection between the activity station and the insight, helping them internalize the insights.

Feedback and co-creation

To help build a sense of collaboration and ownership of the data, the IC included stickers that people could write on and add to the Exploratorium. This also gave the IC feedback on the effectiveness of the exhibitions. As did video that was taken of people reflecting on the Exploratorium after experiencing it. However, because the IC team iterated its designs and tested the effectiveness of its communication as it developed the Exploratorium, this was.
essentially validation of the chosen techniques, but provided another level of participation for the audience, helping to make the experience more personally relevant [140].

Polish

The professional finish of the Exploratorium helped to provide a feeling of authority and professionalism, increasing the credibility of the insights. The IC spent time and money on sourcing professional prototyping materials, such as cut acrylic blocks and professionally printed stickers as visuals. Audience members were impressed by the quality of the work, which is a reflection that the effort increased the credibility of the display. This makes sense for the same reason that designers use low-fidelity prototypes to get feedback from users: essentially, that people take polished work as finished, and in this case, more convincing [31].

Outcomes and lessons learned

Taking an unusual approach to communication was risky, but it paid off. The tangible interactions, stories and quotes helped make the insights concrete and credible, while the shared experience of going through the exhibit helped to spur multiple discussions about how to improve performance. At the Exploratorium, people were having frank, difficult, but useful conversations about what was preventing improvements at Kaiser Permanente.

Members of the IC found themselves facilitating some of these conversations, though they were not trained in moderating difficult dialog. However, their deep understanding of the various perspectives involved allowed them to help. They often had people come up to them
asking, “Well, now what? What do we do about these issues?” – evidence that they’d been able to get people interested in making substantial changes.

The Exploratorium was initially shown at two Kaiser Permanente hospitals that had been the focus of the research effort - one in Northern California and one in Southern California. It quickly became clear that the conversations were lasting past the end of these exhibits, and the IC was invited to show the Exploratorium again at an internal conference, and was told that a new project was being created to tour it around Kaiser’s facilities in order to support an organization wide understanding of the issues Kaiser was facing.

One thing that the IC learned through the Exploratorium experience is the power of words and how important it is to get them just right in order to effectively convey empathy. Working with the representatives of management and staff, they found that often, when one person became very enthusiastic about a particular statement or interaction, the other would caution that it would push buttons for the other side. The IC wound up iterating multiple times to make sure that the wording and embodiment of each insight addressed the viewpoints of both sides – occasionally a very tricky task. At the same time, they learned that communication is more than words – there are other ways of communicating that are sometimes more powerful than words themselves. The Jenga game is a prime example. Interestingly, the insights that were more emotionally driven turned out to be easier to build interactions around, while more factual insights proved more difficult – possibly because they were linked to less powerful stories to begin with. Many of these wound up with question/answer-type interactions, because there were not necessarily emotional or physical analogies to invoke that would make a stronger point. With a foundation in the stories and information from the research, the team found it important to physically build each interaction and test it with people from outside of their team to see if it would be interpreted correctly. Again, finding that iteration on their communication strategies was as important as iterating a final designed solution.

Part of how we got to the point of knowing how we wanted to communicate was having people test it, so understanding how people responded to it. If they got something out of it that was completely different than what our goal was, it led us to a better way to communicate the insight.

– Laura Janisse, Senior Media Designer

The Exploratorium was a large physical instantiation that could only accommodate so many people going through it – no more than a couple hundred at a time – and it was not easily transported between places. This shows one of the drawbacks of some Tangible deliverables – because they are physical, they can’t be easily replicated and distributed. In contrast, a slide deck (Virtual) can be sent out to everyone in the company at once, though there is no guarantee that anyone will read it, nor that it will spur the types of conversations that occur as a result of the interactions between attendees. Because the IC had to choose sub-insights to prototype in order to have each represented by an individual interaction, this format is necessarily on the Abstract end of the Abstract/Detail spectrum. By picking
different sub-insights, the abstracted view of a meta-insight may shift. For example, in the original immersive video of the dinner the fact that people were making relationships across roles was highlighted. In the final version of that table, where audience members would sit down with each other and ask each other questions, that sub-insight became more subtle, and relied on the fact that there were people from different roles at the Exploratorium who would sit together at the table to demonstrate its message that individuals in Kaiser Permanente need to develop relationships across organizational levels. The Exploratorium included both Prescriptive messages, such as the prior example, and Descriptive messages, such as the one conveyed by the Jenga game.

Though dynamic and interactive (Experiential), the Exploratorium format is not necessarily appropriate for the communication of all design research projects. For Kaiser, they were communicating an important and sensitive topic and were able to garner the support necessary to build the Exploratorium. In other situations, the design research team may be more limited by the time and space afforded them, the expectations of their clients, or the inability of people to meet in one location. Even at Kaiser, the Exploratorium was accompanied by a printed report and a presentation. In the next case study, we will examine the use of video by Point Forward to accomplish many of the same goals in a less interactive format.

6.3 **Case study: Insight Documentaries at Point Forward**

Point Forward (PF) is a design research consulting firm based in the San Francisco Bay Area. PF uses ethnographic research techniques to understand customer culture and inform the development of new products and services. Its work is often used to develop key value propositions and to populate product funnels with new ideas – essentially, PF produces actionable research insights. Its work ranges from generative research to inform long-term product and marketing strategy, to customer evaluations of initial product concepts, but always has a strong base in data collected from the actual customer base. Rarely can an organization like Point Forward afford the resources and risk of creating something as elaborate and unusual as the Kaiser Exploratorium. Instead, they attempt to accomplish the same goals within the mediums that are familiar to their clients – as so many of the researchers interviewed for this dissertation have said, slide decks and videos are their standard vehicles.

Over the years, Point Forward’s videos have spanned the gamut from simple clips of people talking for minutes at a time, to clever “insight documentaries” which emulate professional film documentaries. PF has found that over the last ten years, the novelty of using video to present research findings has worn off. Now, the videos have to be more inherently interesting to maintain the attention of their audience. Michael Barry, a founding partner and principal researcher at PF, noted that PF is becoming “kind of an independent film company that kind of does design research.” In most cases, what PF produces are professionally
edited video montages designed to support an insight such as a novel customer segmentation. Video snippets of this kind are embedded in larger presentations, which provide the context and overview of the insights through extensive visual models, quotes, photos, and explanation. This case study looks at a project in which an “insight documentary” was created as a portion of the deliverables. Unlike most videos PF produces, this was able to communicate research results without an accompanying presentation and presenter, which allowed it to be digitally propagated through the client company.

**Documentaries in Design**

The use of video to help represent users and customers is nothing new. Francoise Brun-Cottan and Patricia Wall, in their 1995 article “Using Video to Re-Present the User”, suggest using video to help facilitate conversation in follow-up user interviews, as a way to help researchers capture elusive details they may miss in the moment, and as a means for sharing what was learned in “co-viewing” sessions, in which researchers watch relevant video segments obtained at the user site with others on the development team [19]. Mackay, et al., note that video can help to bridge the gap between abstraction and detail in the design process [92]. Raijmakers, et al., built on this idea by suggesting that documentary filming techniques be used in the collection of video data [113]. They identified four approaches to documentary filmmaking:

1. **Observation** – this approach is also known as fly-on-the-wall documentary, and is characterized by the attempt to maintain neutrality, often forgoing interactions such as interviews, special lighting, etc. An example of this kind of documentary can be found in the 2010 film *Babies*.

2. **Intervention** – this approach goes beyond pure observation and shows the researcher participating and cooperating with the subjects of the documentary.

3. **Compilation** – this approach uses existing footage and constructs an alternative narrative with it by the use of juxtaposition and narration.

4. **Performance** – in this approach, subjects may be asked to perform themselves: essentially re-enacting statements and/or activities from their lives.

Raijmakers, et al., used these approaches to recreate personas in video form to “bring the personas to life” for designers, building up a fictional character with segments, re-enactments, or performances by authentic users. However, using multiple voices and images to depict a single character sometimes confused the designers who watched the video personas, and using a single voice obscured the fact that the insights were built around more than one person [113]. To communicate insights, PF will edit and arrange video and stills it collected during research to build up a narrative illustrating the insights found through its research process. However, though there is a common narrative arc, they never attempt to depict a
single persona as the subject of the film. The philosophy of videography at Point Forward can be said to lie between Observation, Intervention, and Compilation. PF tends to take a very neutral stance in the collection of video – capturing interviews and observations in the moment with little regard to how it will appear as a video later, often to the dismay of the videographer who helps them with the editing. However, they then build a narrative arc in what could be called the Compilation style. The narrative arch helps the audience follow the information, and understand the basis of the insights or proposed concepts without having to go through all the video on their own.

Techniques for insight documentaries

The goal of the project in this study was to help PF’s client understand different hygiene practices around the world and spur the development of new products for the US and international markets. To accomplish its goal, the PF team needed to get the research out to multiple groups within the client organization, and inspire them to create projects in new “opportunity spaces”. One of the researchers on the team, Phoebe Kuo, suggested that instead of relying on the usual slide deck with embedded video, they make a trailer as though the research were a documentary film and send it out to the company to drum up interest. Michael, the senior researcher on the team, gave her and the videographer, Jan, the go ahead. After batting around some ideas, they came back with a plan to do a series of short videos including one “intro” which acted as a teaser for the others. After being “released”, the teaser as well as the other video segments got forwarded around the client company, resulting in the creation of six new projects, including one project that PF was brought in on to do further research. In the words of Phoebe “I wouldn’t say it went viral, but it was ‘very popular’”. The videos did so well, that the sponsors of the project decided they wanted to be in one, and PF helped them make a video on how to be more comfortable talking about hygiene, with the key message, “if you can’t talk about it, you can’t fix it”. The following section examines the techniques PF employed in these videos, many of which are extensions of techniques it uses in creating its regular video montages to embed in presentations.

Overall structure

Like the IC at Kaiser, PF broke up the research results into smaller chunks. In the set of videos, there was one “intro” or “teaser” video which gave a general overview of the research, along with five more in-depth videos which were embedded in a more traditional presentation. However, rather than cluster sub-insights around meta-insights, these videos were organized by country, with one main insight highlighted per location, which also corresponded with an aspect of the overall model that PF presented in the presentation – a 2x2 of cultural hygiene attitudes. This allowed all the segments in each video to support a common story arc. For example, one of the videos was of interviews in Turkey, a primarily Islamic nation. Islam dictates that Muslims must be clean before they perform their five daily prayers, and the segments in the video explored what that meant for the people of Turkey. The video began
by summarizing how many people PF had talked to in Turkey. Then, before getting to any information about hygiene, there was a segment that explored aspects of the interviewees’ daily lives and Islam in general. Each following segment went in depth on some aspect of Turkish hygiene, building up a picture of how religion influences hygiene practices.

The teaser was built up of small snippets from the other videos. For example, in the teaser were clips of the Turkish video alongside clips from interviews in other countries that also touched on the influence of religion, or lack thereof. In this way, the teaser video not only served as a way to interest people in the other videos, but it also worked to draw some of the overall connections and comparisons between the different countries and the US to get across the main insight – that hygiene is different “out there”. The entire teaser was also “hosted” by Phoebe and Michael, the researchers on the project. The “hosting” segments tied the insights from each of the countries together into a cohesive whole, allowing the teaser to be a complete piece on its own, whereas the other videos were somewhat dependent on the presentation or teaser to give them context.

**Guidance**

PF uses a combination of introductory narration, segment titles, and subtitles to help guide the audience in understanding the key takeaways from a particular sequence of shots. For example, when an interviewee was first introduced, the narrator would often give the person’s background, including details like profession and country of origin to help set the context. PF also uses subtitles in some segments to comment on or clarify the interactions taking place in the video. For example, when some of the interview respondents asked about hygienic practices in the US, the actual question was difficult to understand, so they added a subtitle explaining “Respondent asks about America...” In other cases, the narration summarized the insight presented in the section. Other times, this summation is accomplished with a “catchphrase” or tag line that previews in a couple words what the main point of the next segment is. For example, in Italy, PF found that many people use bidets as a part of their hygienic routine. They started a segment examining this part of Italy’s hygienic culture with an introductory title reading “In Italy, Bidet is Best.” These techniques, along with the “hosting” in the teaser, acted in a similar way to the placards in the Exploratorium, providing the audience with cues on what to pay attention to, such as paying attention to why Italians like their bidets.

**User stories and quotes**

The bulk of the videos were built on the use of stories and quotes from user interviews. Though the hosts and guidance helped summarize what was or would be seen, more than 90% of the time was spent on interviewees talking about their hygiene practices or the meaning those practices held for them. As with the audio clips at the listening stations in the Exploratorium, the use of unscripted clips add credibility because of their apparent authenticity.
A good storyteller discussing a topic they know well is one of the best things to capture in an interview. In this study, the first interview PF did was with one such storyteller. They wound up using chunks of her stories to introduce the beginning, middle and end of the teaser video. In this case, there is no particular technique, except to watch out for these people and capture them on video.

You can’t recreate that. When you run into that, you hope you have it captured. You get a few of those on a project, you can help people get to a place where they’re comfortable to let loose, but if you have someone that wonderful on a topic, you hope the camera is working and you get every bit of it. Give them as much space as you can and let them do their thing. You know when you have something like that. – Michael

An interesting issue that comes up with sharing authentic user quotes and stories, is that it can be risky to do so. Because they are such strong evidence, user quotes that express an unpopular-to-the-client view may cause more cognitive dissonance in the audience. In terms of convincing them to unlearn misunderstandings and learn something new, this is an effective tactic. Including the authentic quotes diminishes the likelihood that the audience will disregard the finding entirely, which they may do if it is just stated without strong evidence. However, the researchers may first have to convince their immediate client sponsors to share the unfiltered evidence of opposing viewpoints with the rest of their organization – though the researchers have the luxury of being outsiders, the client sponsors must go to work the next day with the other people in their organization who may not be happy about what they were shown.

**Challenging questions**

To guide the audience in questioning its assumptions, and possibly unlearn incorrect ones, PF will pose what it calls “challenging questions”. For example, in one segment of the intro video, the hosts asks whether a particular hygiene practice is really sufficient for preparing “us” to be in intimate situations. By posing the question in the collective first person, the audience is prompted to relate the findings back to its own experience, increasing personal relevancy. PF then juxtaposed this question with a segment featuring someone who had to deal with someone else’s hygiene failure due to that practice, which drives the audience to think “could that have been me?” In another instance, PF placed a picture of a very dirty bathroom in Indonesia next to a clean, luxurious western bathroom and asked “which is cleaner?” though the bathroom in Indonesia was obviously dirtier, the person who used it had a more thorough hygiene practice, so was ultimately cleaner than the person in the luxurious western bathroom. These types of challenging questions are similar to the surprising answer game-type interactions that the IC used in the Exploratorium, forewarning the audience of what surprising information will be presented.

In other cases, challenging questions might come in the form of “how might we...?” inviting the audience to consider an opportunity area. In these cases, the questions are
more like the analogous problem-solutions sets, as they prompt the audience to think of new possibilities. Interestingly, PF uses analogous problem-solution sets when the goal of a project involves developing a specific design strategy – for example, the use of a Rubik’s cube to suggest intelligence and modularity, and again ask, “how might we create a new product in the spirit of a Rubik’s cube?” However, in this project, because PF was aiming to spur projects across the client company, an analogous problem-solution set would have been too prescriptive.

**Invisible special effects**

Though the use of unpolished video segments provides an aura of authenticity, the editing has to be very professional to give an aura of credibility to the analysis and compilation of those segments – echoing the need for the professional execution of the Exploratorium. Good editing is an artistic process, and is important to keep the audience’s attention. PF uses classic documentary film techniques as a “volume knob” to amplify what it wants to communicate to its clients.

- **Secondary images:** The use of still images like the one in Figure 6.9, or video clips without their own audio, break up the visual monotony of watching a person talk about themselves, while adding some extra contextual detail and are a technique to hide poor videography. They also offer an opportunity to make visual commentary through the use of supporting or contrasting images, which allows the viewer to read the video on two levels: the meaning of the quote and the perspective added by the secondary images [48]. The tension that emerges between these two levels forces viewers to develop their own opinions [58]. One thing that is less obvious when working with video than pure audio is that the quality of the audio can make or break the impact a quote or story has. PF’s videographer has been known to say “if you don’t have sound, you don’t have an interview”, even if the image is perfect. Poor audio adds unnecessary noise to the aural channel, creating distractions and diminishing information processing [111]. And unlike poor video, which may be covered with a secondary image, it’s difficult to compensate for poor sound.

- **Rhythm and tempo:** The duration of clips and the number of clips in a sequence create the rhythm and tempo of the video [28]. The timing of transitions is key for the emotional and associative properties of video clips. A quick cut between two video clips juxtaposes them together, amplifying their similarity or contrast. Adding or removing frames changes the “space” around a quote, allowing or denying the audience a chance to contemplate what was said before the next clip is shown. Varying the tempo of the video is similar to varying the speed of speech or narrative – it draws attention to the important moments, and allows the audience to relax in between, providing an “enjoyable ride” through the narrative arc. A lack of variety will quickly turn monotonous, even over the course of a short five-minute video – as
Michael said, “The kiss of death is having the same rhythm throughout the whole piece.”

- **Music**: Integrating music into the video segments provides an emotional backdrop for the audience, cuing the audience to feel a particular way about what’s being presented in the video. For example, in the opening segment of the Turkish video, music was coupled with images to help set the context by indicating a geographic place (Turkey) and appropriate mood (solemn). Music can also be used to provide support to the video organization, pacing and shifting of segments [33]. For example, a common piece of music was used in the opening and closing “hosted” segments, as well as several times when the video went back to the hosts, indicating a shift from presenting the actual stories and data to the abstracted over-arching insights.

**Humor and novelty**

Humor occurs when things appear to be simultaneously normal and wrong [144]. For example, the opening sequence of the insight documentary uses toilet paper, a common implement of hygiene, as a canvas for the title. The novelty of unrolling toilet paper (a normal act) to see words written on it (unexpected) makes one chuckle; juxtaposing opposites in the title displayed invokes both truth and impossibility, “an intimately global journey”, making one chuckle again. Throughout the video, the hosts, one of whom wore a bow-tie, made use of puns and word plays to lighten the mood.
PF purposely used humor to help normalize an awkward and often taboo subject: personal hygiene. Using humor allows PF to illustrate insights that may be offensive or uncomfortable for the audience. For example, in one segment, people in Turkey asked about hygiene practices in the US. After being told how the US practices differed, they asked “isn’t that uncomfortable? Really? Isn’t that uncomfortable?” The interviewer replied: “...Uhmm...” This draws a laugh as it makes the audience first feel bad about something (“I have poor hygiene, because that is the same routine I use”) and then immediately feel better about that very thing (“no, we have poor hygiene: me and the interviewer and everyone in the US”) [144]. At the same time, it makes the point that maybe the US doesn’t have the best hygiene routines, in terms of both cleanliness and comfort.

PF also used relevant pop-cultural images instead of relying solely on photographs taken during the interviews, placed in unexpected places both as commentary and comic relief. For example, the image of Arnold Schwarzenegger in Figure 6.10 was inserted over someone talking about the strength of tissue paper, an oblique reference. Other humorous cultural references came in the form of snippets of commercials or music videos used as transitional segments, often only relevant through a play on words. Though not a perfect parallel to the Exploratorium, the use of humor echoes the IC’s use of games to bring some fun and lightheartedness to the experience of dissecting a difficult subject.

Figure 6.10: This picture of Arnold Schwarzenegger is an example of a cultural reference Point Forward used to humorous effect when someone mentioned strength
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Overlaying stories

Drawing on the principle of Social Proof [31], Point Forward juxtaposes people saying similar things to build up evidence for a particular insight. For example, discussing hygiene in Australia, they had multiple people telling similar stories about how they had developed a particular hygiene practice. These stories can be woven together to some extent, essentially contrasting each individual story to the others. However, it didn’t work to weave multiple stories together as though they were one. When crafting their videos, PF will first look through the transcripts and use the words to develop a “script” – a set of quotes that illustrates what they are trying to communicate. Then, using the time codes on the transcriptions, they will find the video segments and edit them together. When three interviewees had very similar stories, PF was able to weave them together into a great script on paper. But when the videographer started to edit the actual clips together, it didn’t flow as a cohesive story.

Outcomes and lessons learned

As a Virtual artifact, the insight documentary was easily propagated throughout the client organization, increasing the socialization of the research. Slide decks also have this advantage, but they can be challenging to understand and notably less engaging without someone there to present the slides – as Phoebe said, “who wants to read a powerpoint?” For example, PF had a set of videos that weren’t associated with the hygiene project, which were created to essentially introduce a new customer segmentation scheme. The videos used many of the same techniques as the hygiene project, but with less embedded guidance, relying on the surrounding slides to make sense of the clips presented, which in turn relied on the researcher’s presentation of the slides. In an insight documentary, the “host” acts as the presenter and guide so the video as a whole can be processed on its own.

What an insight documentary can’t do is make up for not having video to back up particular insights, no matter how well they are researched. For example, PF discovered a common, possibly unconscious, belief that by talking about a taboo subject, some of the taboo will transfer to the speaker. However, the team had very little video that could illustrate the insight, because it was only after their analysis and additional secondary research that it became apparent. As an alternative way to communicate the idea, PF used a variation of the Hitler-Sweater Experiment during the presentation to their clients. In the Hitler-Sweater Experiment, people are asked if they would wear an article of clothing previously owned by a number of famous people [120]. In general, the answer is yes to people like John F. Kennedy, or Albert Einstein. However, when asked if they would wear Hitler’s sweater, the answer is almost invariably no, even if it was first thoroughly cleaned and loaned to someone like Mother Theresa. The possibility of “contamination” through wearing Hitler’s sweater was analogous to the possibility of “contamination” through the discussion of taboo subjects such as certain aspects of personal hygiene. Because the insight that talking about personal hygiene would make one less clean wasn’t directly supported by particular quotes from interviews, it didn’t make it into any of the videos they made. Instead, it was only accessible
through the research presentation and slide deck, or as Michael put it, they had to “talk through it”, diminishing its propagation throughout the client organization. The video on internal communications, in which the client sponsors starred, was attempting to address some of the issues around talking about hygiene by encouraging the client organization to normalize its discussion.

### 6.4 Case study: Genevieve Bell and Insight Pitches

Genevieve Bell is the Director of the Interaction and Experience Research Lab at Intel Corporation, where she investigates how people use technology in their everyday lives. As the director of the lab, and a pioneer in the field of design research, she is often the spokesperson for the group’s research findings. Several short videos of her presenting research insights are available on video-sharing site YouTube. These videos are short, engaging, informative and inspiring, much like an “elevator pitch” for a product or service. This case examines three of these insight pitches, as they offer good source material to mine for insight communication techniques. For full transcriptions of the videos, see Appendix B.

Two of the pitches focus on communicating insights from Intel’s Smart TV initiative: one from May 2010 [11], and a second from June 2010 [9], were created to communicate the key insights surfaced in an extensive study of television. Those insights – that people love television because it is 1) incredibly simple, 2) incredibly flexible, and 3) about being social – are brought to life in these short presentations with anecdotes, images, and quotes.

The last pitch, from October 2011, presents insights from an extended survey study on the evolution of mobile etiquette [10]. In this video, Bell summarized what they found had stayed the same and what had changed over the previous three years when it came to mobile etiquette:

> Unsurprisingly, we are still concerned and annoyed by the way people text while driving, by the fact that people text at the dining room table, the ways that people overshare on social networking sites – sometimes about us. And, you know, we all still worry about what people are doing when they take their mobile phones to the bathroom.

> And by the same token, there are a whole lot of things that have changed. In some ways our boundaries for thinking about where technology may bear down in our lives really has shifted. We are much more willing to imagine taking a laptop away for a holiday weekend, we’re much more willing to imagine that you might actually have a phone in a movie cinema, or on an aeroplane. – October 2011

Bell’s insight pitches seem to follow a common script: she begins with an introduction to the design research methodology practiced by her lab, mentioning the length and breadth

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2An “elevator pitch” is a term in business that refers to a short summary description of a product or service which should excite others about that product or service. It’s used here to refer to these short videos in which Bell is summarizing research insights in a way that is meant to excite others about them.
of the study; she then indicates how many insights or insight groups there are before going more into depth on each one. She finishes by interpreting what these insights imply for the future. All three pitches were produced as online news snippets. In two of them (June 2010, Oct 2011), Bell talks directly to the camera for the length of the 2-3 minute clip, as shown in Figure 6.11. In the other pitch (May 2010), Bell is again talking directly to the camera, but the video includes secondary images, as well as a TV placed behind and to the right of Bell. In addition, this video has some electronic music playing quietly in the background.

This case differs from the other two because these pitches were created not only for a client, but for a general audience, possibly targeting those who would be early adopters of technological products. In fact, though Bell spells out an opportunity, she promises “more to come” rather than helping the audience to explore the possibilities on its own. However, examining this set of insight pitches reveals similar strategies to those employed in both Point Forward’s insight documentaries and Kaiser’s Exploratorium: building credibility, providing variety, providing guidance, including quotes and stories, with humor and surprise, and using rhetorical questions.

![Figure 6.11](image1.png)
(a) June 2010: On Smart TV
(b) October 2011: On Mobile Etiquette

Figure 6.11: In these clips Bell speaks directly to the camera without interruption

![Figure 6.12](image2.png)

Figure 6.12: In this clip Bell has supporting imagery
Building credibility

All three videos introduce Bell and identify her as a member or director of one of Intel’s research labs before Bell begins her pitch. In addition, Bell identifies herself in varying ways as an expert, either citing her title or her role as a professional social science researcher. However, she does so in a casual and friendly way, increasing her likeability. These introductions help build her credibility to talk about the following subject.

I wanted to start by reflecting on the kind of methods we use here. So our work has been intensely grounded in research social science and design methods. That means we spend time in people’s homes, we get a sense of what makes them tick, we spend time all over the world, with people, sitting on their sofas, watching television with them. And as we’ve done that work over the last five years, there’s a couple of things that have really emerged for us. – May 2010

Bell then mentions the extent of the research used to inform the insights she subsequently presents. For example, she mentions conducting “worldwide” surveys to understand the shifts in mobile etiquette over a course of three years, and mentions that the study on television took five years.

Variety by being short and clear

A key thing that’s not obvious on first viewing is that these pitches are powerful precisely because they are short. They are just long enough for Bell to get her message across, but short enough that they don’t become boring - the longest comes in at under three minutes. So, even though two of the three videos have no secondary imagery, none of them are long enough to get boring. In addition, Bell does a good job of varying the speed of her speech and using expressive facial expressions and body language to add emphasis, as shown in Figure 6.13. Not only does this add some amount of guidance on what she sees as interesting, it also keeps the image and audio from becoming too monotonous. By displaying emotion, the audience is likely to experience a reflection of those emotions due to the mirroring properties of the human brain [57]. Thus, Genevieve’s excitement over the future of television increases the audience’s excitement about it.

To make these pitches short, Bell simplifies her message, focusing on just a few important insights that she clearly delineates with guiding cues, and illustrates with examples. For example, in each pitch, Bell uses the phrases “hanging out in people’s homes” and getting a sense of what makes them “tick” – simply and quickly describing in a image-provoking way how she conducts research.

Guidance

Though the insight pitches in these videos are primarily verbal, Bell still uses a combination of visual and verbal guidance strategies. She first previews how many segments to listen for,
Figure 6.13: Bell uses various facial expressions to add emphasis, interest, and emotion then clearly indicates the transition from one to the next.

**Preview of segmentation**

After introducing her methodology, Bell indicates how many key insights she will introduce. For example, she notes there were “three things that stand out about why it is that people care about TV”, and concerning mobile etiquette, that “what’s been really interesting as we’ve seen that data shift over the last three years is the places where we’ve seen really big changes and the places where things remained the same.” She couples these statements with hand gestures that emphasize what she is saying, as can be seen in Figure 6.14.

(a) In this shot Bell uses two hands to contrast what has and has not changed in mobile etiquette

(b) In this shot Bell uses three figures to represent three insights about Smart TV she will cover

Figure 6.14: Bell indicates the number of topics she will cover with the help of hand gestures
Tracking progress

As Bell switches between insight segments, she tracks her progression for the audience with her fingers (Figure 6.15), as well as by verbally distinguishing each segment with a clear segue. In the insight pitch on mobile etiquette, where there were only two areas she wanted to talk about, the transition was fairly simple: “And by the same token, there are a whole lot of things that have changed” (October 2011). However, the three insights from the social television work required more complex transitions to maintain clarity for the listener. Here, she starts and ends each segment with a repetition of the key insight. Essentially, she states the insight, offers evidence to support her statement, then restates the conclusion:

One is that it’s incredibly simple. [...] So: [it’s] incredibly important that television be simple.

The second thing that’s really clear to us as we’ve talked to people about TV, is that television is about being social. [...] So TV is important because it’s social.

And then last but not least, I think one of the things people really care about television is that it’s flexible. [...] I mean it’s all of those things, right?

June 2010

In the May 2010 video, the verbal segmentation was more subtle – Bell states each insight and supporting evidence, but doesn’t restate the conclusion. In this video, the editor instead segments the insights visually by cutting away to examples of television content, like that shown in Figure 6.16, during the first and third insight discussions.

Quotes and stories

Only one of the three snippets didn’t present direct quotes in some form – the video on mobile etiquette. In one case, the quotes were integrated into what Bell was saying:
Figure 6.16: Secondary videos, like this one, were used to segregate the three insights

And over the last ten years we spent a bunch of time talking to people about TV: about why it’s important to them; about why they care about it; in the words of one woman, “why television is better than chocolate.” [...] It can be the place you go on a Friday evening just to watch trash and kind of “veg out” as someone once put it to me. — October 2011

In the other television video, Bell never actually quotes anyone directly in her pitch, however the television behind her shows a series of subtitled videos, presumably showing participants in the television study:

Figure 6.17: Bell uses the television in the background to show quotes and snippets to support what she’s saying

Besides direct quotes, Bell includes multiple scenarios invoking scenes familiar to most people:

So whether it’s you sitting down with your buddies watching football, or whether it’s watching children’s television with your kids, or whether it’s the fact that television gives you something to talk about the next day in the office or tonight online. Television is all about delivering a social experience. — May 2010
We are much more willing to imagine taking a laptop away for a holiday weekend, we’re much more willing to imagine that you might actually have a phone in a movie cinema, or on an aeroplane. – October 2011

Though these are not direct quotes from research participants, they act as evidence by being almost universally familiar, evoking stories from the audience’s own lives rather than the lives of the research participants’.

Humor and Surprise

For both television and mobile etiquette, Bell brings up what are generally uncomfortable subjects – activities that likely evoke a sense of shame. For example, she mentions being “beaten in the cricket”, the practice of “babysitting” children with television, “vegging out” in front of the television, and how people “take their mobile phones to the bathroom.” However, she normalizes these activities, partially by including herself in the group of people affected by them. For example, she implies that she may babysit her children with the television: “it can be how you babysit your kids, even if we don’t want to admit to that” (emphasis added). When Bell mentions being “beaten in the cricket,” her inclusion is emphasized by her facial expression, shown in Figure 6.18(a), revealing a little bit of vulnerability on her part. She also uses an exaggerated facial expression to deflect the implication that the audience might “veg out” (Figure 6.18(b)). Both the humor, which normalizes rather than shames, plus the small display of vulnerability by including herself, likely builds good will for Bell.

Figure 6.18: Bell’s facial expressions normalize these activities by indicating she is part of the population that participates in them
Rhetorical questions and concrete answers

These insight pitches primarily focus on raising excitement or acceptance around the insights, and Bell uses rhetorical questions to inspire the audience to imagine possible futures based on the insights she summarized:

And when we look at the future there and we start to think about, what does it mean to bring the internet to television? What does it mean to have new kinds of platforms next to your television? What does it mean to talk about something like smart TV? For us, it’s really important to think about the persistence of television. – June 2010

However, instead of guiding her audience in answering these questions, she implies that she or her company, would be working on the questions and ideas she is suggesting. Bell’s discussion of the future is also inspirational because she is very concrete in her predictions:

And I think we’ll keep seeing those things shift as we work out our relationships here, because after all, while the technology is relatively new, these are long standing social rules we’re trying to work through, right. And for me, etiquette is always going to be in flux as we negotiate those things. – October 2011

By helping her audience to anticipate how things will be, she is helping them be more comfortable with the changing nature of their relationship to technology.

6.5 Common strategies

The previous three sections examined three different ways to communicate design research findings – a museum-like exhibit embodying insights, insight documentaries, and insight pitches. All three approaches were successful in creating an effective balance of interestingness, relevancy, and actionability.

- **Interestingness:** As outlined in Chapter 3, interestingness is a combination of novelty, surprisingness, appropriate complexity, and ambiguity. Novelty and surprise were used to humorous effect in the documentary and YouTube videos; surprise was used as a teaching tool in the Exploratorium. By providing guidance based on an understanding of the audience, all three communication pieces controlled the complexity level, providing appropriate amounts of support for processing the presentation; or, in the case of Genevieve Bell, by simplifying the message.

- **Relevancy:** Quotes about familiar situations and emotional analogies were used to stimulate a sense of personal relevancy and meaning in the Exploratorium. In the documentary, this was done through the use of classic film-editing techniques which draw the user into a story arc, and through the use of challenging questions which
prompt the audience members to relate the findings back to their own experiences. In both of these cases, the deliverables were also crafted specifically to meet the goals of the client, with input from client representatives to make sure they were presented from the clients’ points of view so they remain relevant as they progress through the findings. Bell likewise used lots of familiar example situations to essentially allow the audience to fill in their own stories. Her audience, not being a client, was talking to people online interested in the integration of the internet and television – most likely technology “lead users”.

- **Actionability:** In both projects with clients (PF and Kaiser), the goal was to spur discussion of possible changes without directing specific action. To do this, both pieces presented some form of “how might we...”, guiding the audience in turning the insights into potential opportunity areas. In PF’s insight documentary and accompanying presentation, this question was asked explicitly; in Kaiser’s Exploratorium, the analogous problem-solution sets asked the same of the audience. For Bell, the goal was more to promote excitement about the insights, rather than promote the use of them. However, she still inspires the consideration of possible futures by making some predictions and asking questions about what future products and interactions could be.

Comparing these three cases, a number of common techniques emerge: using analogy and metaphor, using quotes and stories, providing guidance to the consumption of the material presented, using surprise and novelty, iteration and having a polished finish. Each of the formats had particular affordances and limitations in using these techniques.

- **Analogies and metaphors:** These were most effectively used in the Exploratorium by offering an experience such as playing a game of Jenga and immediately linking it back to the issues the IC had observed in Kaiser’s organization. In PF’s videos and presentations these are often simply the metaphors and analogies that interviewees use, or they are used as analogous problem-solution sets to inspire thinking about new product ideas. Bell never quite used these in her presentations, though this is likely because of the differing goal of her communications.

- **Quotes and stories:** In all three cases, quotes and stories were presented in as raw a form as possible to retain their authenticity, while being curated enough to retain interest and fit in the chosen format. The documentary format lends itself to a heavier use of user quotes, as it is primarily a presentation of what people do and say. The Exploratorium was able to effectively use the drawings of their interviewees as posters and banners, but the listening stations wound up being a somewhat solitary experience in what is primarily a social context. While this provided a variety of interactions, people may only stay at a listening station for a short time. The quotes presented there were then supporting, secondary evidence rather than being the bulk of the experience as in the videos where 90% of the time is spent listening to interviewees. In
the insight pitches, Bell incorporated quotes as examples in two different formats and invoked personal stories from the audience.

- **Guidance:** The type of guidance given in each of the pieces was based on the affordances of the medium. For example, in the short format of an insight pitch, Bell was primarily limited to verbal and gestural forms of guidance. In the documentary, guidance could be built into the narrative within the video and around it in the presentation. The IC provided guidance by being present and walking the audience through the exhibit when possible. However, for many audience members, the guidance came primarily in the form of the placards placed at each station. Since not everyone would read these placards, not everyone in the audience would receive the same amount of guidance.

- **Surprise and novelty:** While both PF and Bell used surprise and novelty to create humorous situations and normalize the discussion around touchy topics, Kaiser’s insight prototypes used surprise as a teaching tool in the question-answer games. The narrative nature of video and speech bend well to the use of humor and surprise, whereas the interactive nature of the Exploratorium is novel and interesting, but less readily humorous. Without control over the timing of the reveal of a surprise, it is more difficult to build up tension and release in the non-linear format of insight prototypes. However, the Exploratorium affords interacting with the insights in more varied ways, and is a more participatory medium, which may be more inherently engaging.

- **Polish:** Two of these communication pieces were final deliverables for substantial projects. To add to the credibility of their findings, a lot of effort was put into making sure that the insight embodiments were professionally crafted. Kaiser spent time and money on sourcing professional prototyping materials, while PF spent time and money on professional videographer and editing services. Both pieces are built around unpolished interviewee materials in a highly curated and polished medium. In the third case, though the insight pitches were short and apparently somewhat informal, they were still well produced and Bell’s delivery was well practiced, as you would expect with any type of elevator pitch.

- **Iteration:** Both PF and the IC use a process of iteration to craft their deliverables into actionable communication pieces. In addition to iterating to make sure the message and tenor of the piece communicates what they intend it to, both groups use their immediate client representatives as sounding boards, essentially acting as litmus tests for the rest of the client organization. Though the Bell case didn’t include insight into her process, the progression of the Smart TV pitches from May to June show a honing of her message. In the second, she included more quotes and humorous asides, and framed each of the insights with opening and closing statements, increasing their clarity and impact.

The next chapter will present a process for combining the double ethnography discussed in [Chapter 4] with the development of deliverables such as those presented in this chapter.
Chapter 7

Summary, Recommendations and Future Work

The influence of design research on design decisions is critical to product success (e.g., [56], [96]). Even so, in the story opening this thesis, Coca-Cola USA rejected a packaging concept that had been designed based on the needs and preferences of its customers. This thesis investigated what makes the difference between rejection and successful adoption of research and research-based concepts by studying the collective experiences and insights from multiple design researchers. Through interviews, workplace observations, questionnaires and case studies it explored how design researchers might increase the impact of their work on the design process. This chapter begins by summarizing the key findings of this research, and then lists recommendations suggested by those findings. The thesis concludes with a look at possible future research directions.

7.1 Summary

Communication in design process models

A generic design process with multiple points of entry was developed, as shown in Figure 7.1 through an analysis of 71 design process models. An examination of how often and in what contexts communication was an explicit step, found that 20% of the processes discussed communication explicitly. However, only 3% of the 71 models explicitly dealt with communication of research in such a way that it might have an effect on the design outcome. Considering other steps that imply the explicit communication of research results showed that design process models may include or imply the communication of research results only 3-30% of the time. Essentially, communication of research results is seldom an explicit part of design process models, despite its importance. This could be because of different possible assumptions: an assumption that in the “multidisciplinary design team,” communication is ongoing between team members; an assumption that the team that conducts research will
then carry out the solution development; or an assumption that communication is an activity orthogonal to the design process itself. Nevertheless, communicating design research results to other stakeholders in the organization is crucial for the research to have an impact on the design outcomes.

The human-centered communication process

The study of the communication strategies employed by expert user researchers suggests identifying and understanding designers and decision makers in the design process through a double ethnography. In a double ethnography, design researchers apply the skills and philosophies of human-centered design to carry out two parallel ethnographic studies: the first, more visible study focuses on the end users or customers; the second, less visible study focuses on the designers and other stakeholders of the design process on the client side. Though to the audience of the research deliverables, it may appear that defining and redefining the problem is based only on a study of users, in reality, both studies inform the development of the problem, as shown in Figure 7.2. In addition, design researchers design

Figure 7.1: Generic Process Model developed in Chapter Two
actionable deliverables, socialize their research within their client organizations, and foster a sense ownership in their clients to respond to inertia-related communication issues they face. These three tactics provide levers of control against the bias and resistance to changing thought worlds identified in [Chapter 3].

In order to ensure the presentation of relevant evidence at an appropriate level, this study further suggests treating design research communication as a design problem. To craft actionable deliverables, presentations, and workshops, design researchers use an iterative prototyping approach similar to the process used by designers in the Solution Development Cycle (see Figure 7.1). As shown in Figure 7.3, the process includes testing and refining communication pieces with others in the research team or organization as well as with representatives of the client organization. This helps to clarify or remove inappropriate wording, diagrams, or activities that may be unacceptable to the client organization or diminish the clarity or credibility of the piece due to the prior knowledge or culture of the client.

Figure 7.4 couples this iterative prototyping process with a double ethnography. Looking at the activities that design researchers carry out specifically to facilitate the communication of their research results shows that they essentially conduct a full human-centered design process, or human-centered communication process, in the development of their communication pieces. The generic design process model, then, is extended by this communication process, which runs in parallel and between the primary design activities, as shown in Figure 7.5.

**Persuading and Motivating Designers**

The communication strategies employed by expert user researchers were analyzed for the application of Principles of Persuasion and Motivation to Learn. The number of times design
CHAPTER 7. SUMMARY, RECOMMENDATIONS AND FUTURE WORK

Figure 7.3: Iterative design of design research communication

Figure 7.4: Human-centered communication process for developing design research communications
Figure 7.5: Design process with Human-centered communication embedded

Researchers mentioned activities that invoked these Principles during a set of interviews on their communication processes are summarized in Table 7.1. This analysis showed that design researchers focus on presenting Relevant Evidence at an appropriately Challenging Level, while increasing interest through the incorporation of Variety & Novelty, facilitating immediate Positive Outcomes, and drawing on their Authority as experts. Examining three successfully actionable and effective design research communication pieces revealed common strategies for creating engaging, credible, and inspiring deliverables, which are summarized in the next section.

7.2 Recommendations

Based on an evaluation of interviews, workplace observations, questionnaires and case studies with fifteen expert design researchers, four design engineers, and three project managers, the techniques, strategies and metrics for the effective communication of design research, outlined in this section, were identified and developed.
Table 7.1: Frequency of application of Principles

<table>
<thead>
<tr>
<th>Principles of Persuasion</th>
<th>Principles of Motivation to Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence</td>
<td>Relevance</td>
</tr>
<tr>
<td>114</td>
<td>141</td>
</tr>
<tr>
<td>Authority</td>
<td>Challenge Level</td>
</tr>
<tr>
<td>50</td>
<td>104</td>
</tr>
<tr>
<td>Social Proof</td>
<td>Variety &amp; Novelty</td>
</tr>
<tr>
<td>35</td>
<td>70</td>
</tr>
<tr>
<td>Consistency</td>
<td>Positive Outcomes</td>
</tr>
<tr>
<td>33</td>
<td>57</td>
</tr>
<tr>
<td>Reason</td>
<td>Completion</td>
</tr>
<tr>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>Liking</td>
<td>Surprise</td>
</tr>
<tr>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>Reciprocity</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Scarcity</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Techniques for communicating design research effectively

1. Develop communication pieces using a human-centered design approach

   • Learn about clients’ assumptions, biases, needs, viewpoints, etc., by turning the ethnographic lens on the client organization. What is the organizational culture? The hierarchy? Where might issues of translation or inertia crop up? What kinds of narratives and forms of information have the most credibility within the organization? Try to meet as many people as possible beyond your immediate client to better understand the nuances of the organization.

   • Consider every interaction with clients as an opportunity to learn more about the organization – primary clients can act as both representatives of the rest of the organizational culture, and as collaborative informants who can answer specific questions about the organization. Throughout the project, note what surprises them, what they focus on, or are confused by, especially during fieldwork activities.

   • Plan activities that will identify information needs throughout the project. The most sophisticated plan for overcoming issues of inertia and translation can fail if researchers do not understand where, when, and how their clients and stakeholders need communication.

   • Choose a novel but appropriate communication medium. What communication technique or techniques will best convey your message? What resources do you have? What skills do you have? At the same time, consider what your audience will expect, and whether you want to break those expectations. If so, why?

   • Use an iterative design process to develop actionable research deliverables, presentations, and workshops. Use coworkers, clients, and others as “spring boards” and test beds to determine if the wording is balanced between provocative and acceptable, if the correct emotions are evoked, and if the insights are presented in an interesting way. Iterate and iterate again if necessary.

2. Socialize your research findings throughout the client organization
• Spend time with clients outside of the regular work day. Bonding through field trips to meet end users, shared meals during data analysis sessions, and other curated activities creates relationships which encourage primary clients to vouch for the researchers. The accompanying translucency of work process may also serve the credibility of research better than hiding the details.

• Circulate stories and quotes that are humorous, surprising, or “outrageous”. Anecdotes are easy to grasp, recall, and pass along, so they may be told and retold, helping to shift the organization’s shared system of meaning [18, 66].

• Digital artifacts, such as short videos or presentation slide decks, are easy to pass around, but are more effective if they are designed to evoke an emotional response. Use the iterative design process outlined above to make sure communication artifacts have the desired effect, and convey the research intent without external guidance.

3. Foster a sense of ownership over the research in clients by facilitating emotional and professional investment in the research

• Bringing clients out into the field to meet users triggers their mirror neurons and invokes their capacity for empathy, though different people have different capacities in different situations. By developing a sense of empathy or liking for the people they meet, designers are more emotionally invested in solving the problems facing those people.

• If bringing people into the field is not possible, well edited video can also trigger mirror neurons by presenting an intense, possibly even hyperreal [45], representation of reality. Data-rich storytelling with photographs and video can also help make the deliverables “come to life,” sparking the audience’s imagination and building empathy.

• Show through a narrative and emotional medium (stories, storyboards, video, roleplaying) how an idea or concept may be able to positively affect someone’s life. This helps build a feeling that the work is meaningful and has purpose, which can be used to motivate many people in their work.

• Guide clients in building a framework, or developing a research insight. Not only does this indicate that they have somewhat internalized the research being presented, but they will feel they have helped create something of value, invoking a sense of competence. A desire to hang on to this sense of competence that will increase the likelihood that the client will continue to work with the framework or insight.

• Similarly, guide clients in applying the research to generate concepts that meet user needs; this fosters a sense of ownership over the concepts generated. Follow up document-focused presentations with experiential-focused ideation or brainstorming sessions.
Strategies for Creating Actionable Deliverables

An important part of communicating design research is facilitating its use in the rest of the design process. This begins with the creation of deliverables that are immediately actionable; in turn, supplying designers and engineers with the tools and skills to use research insights in their own design processes. These deliverables are neither descriptive analysis nor prescriptive direction, while combining aspects of both, and may be based in delivering an experience rather than an artifact. However, what is actionable will be different for each organization and each project, and so creating an actionable deliverable depends on the successful execution of the human-centered communication process. This section presents strategies which may increase the effectiveness of communication pieces, and can be used through the iterative communication design process.

The following strategies increase the credibility of deliverables

1. **Relevancy** – Connect all of the information presented back to the concerns and viewpoints of the client organization. Address the explicit goals of the project as well as the client needs revealed through the double ethnography. Make sure the connections are clear, and the goals and needs of the client are fully met by eliciting feedback from the primary clients. Create a sense of personal relevancy by drawing parallels between the lives of clients and users through the use of emotional analogies and challenging questions.

2. **Evidence and reason** – Conclusions and insights should be backed up with strong empirical evidence, especially those insights which are controversial or provocative for the client organization. A lack of evidence backing up a “bold statement” may lead to that assertion being rejected by the client organization as untrue if it is too far outside what they expect.

3. **Balance authenticity and polish** – The roughness of unedited quotes and stories, amateur video and photography, and other artifacts of the research process, increases the perception of these artifacts as being authentically found, rather than having been constructed for the purposes of the researchers agenda. However, the curation and compilation of these materials can make or break the perception of the design researcher as professional. To that end, learn the tools and tricks of the design, art, and video trades to create polished deliverables and presentations, or employ someone to assist in their use.

The following strategies make deliverables more engaging

1. **Surprise and humor** – Humor must allow people to feel that things are normal, but at the same time, that something is wrong or abnormal – an apparent paradox. To be subtly provocative, or to cut tension with the use of humor, requires a good understanding of one’s audience, as there is a fine line between offense and humor. Before
integrating humor into a deliverable, make sure that it evokes the correct response. Surprise occurs when there is a violation of one’s expectations, making it closely related to humor. Though the use of surprise can be provocative, the surprise should be foreshadowed with evidence or rhetorical questions in order to cut down on the pain of being surprised.

2. **Variety and Novelty** – Integrate visual and verbal and possibly kinesthetic means of communication to both reinforce the processing of the research presented, and to minimize saturation of any one medium. In addition, vary the speakers, vocabulary, message and pace to maintain interest. Use novel or unexpected images, sounds, or formats to capture clients’ interest. However, balance variety by providing a common narrative or element through the communication to provide continuity and build narrative tension.

3. **Interactivity** – Interactivity is often a term associated with websites. However, deliverables and presentations can be interactive on different levels. Create narrative tension through the use of stories or rhetorical questions, which is a form of interaction. Tangible artifacts are inherently interactive, if only through the sense of touch.

*The following strategies decrease the challenge level of understanding and applying design research*

1. **Provide guidance** – The type of guidance will necessarily vary depending on communication medium and context. However, whenever possible, build the guidance into the research deliverable, or a version of the deliverable, to facilitate socialization of the research. Guidance refers to the pieces of information that the client will need to understand the research presented, as well as to prompts, questions, and suggestions to help clients apply the research in generating strategies and concepts. Problem solutions analogies and metaphors are useful for both purposes.

2. **Clarity and simplicity** – By its nature, design research is about complex and nuanced subject matter: the intimacies of users’ lives. However, other stakeholders in the design process, especially those in the management team, often have too much on their plates and are unable to take the time to process these complexities. To present research findings in a way that these audience members will be impacted, distill the key insights down into something clear but simple. Discussion within the research team can help highlight what the key takeaways are.

3. **Pose doable challenges** – Doable challenges are tasks that are just within the capabilities of those performing them. These should be somewhat flexible, since the capabilities of each person will vary. A useful activity is to have clients brainstorm concepts, connect them back to the insights from the research, and vote on the concept that best addresses the research intent.
CHAPTER 7. SUMMARY, RECOMMENDATIONS AND FUTURE WORK

Metrics for successful impact

Even applying all of these techniques, it can be difficult to determine the effects design research has on a product as it progresses from initial concept to pilot test and market launch. This is especially so for those outside of the design organization with a limited engagement. However, the following metrics, which many design researchers use informally, can be used to evaluate the impact of design research on the design process.

Metric 1: Adoption

Just as market penetration is one measure of the success of a product, estimate the extent to which the client organization adopts the research by looking for extent to which research is socialized – are stories being retold? Are copies of slides from research deliverables being incorporated into client-created presentation decks? In particular, adoption success comes from demonstrations of actionability: when a client uses the story within participatory design exercises such as brainstorms. In the longer term, also look for strategy and product changes that align with the research insights. Since these indicators may be less clear, they are more valid in conjunction with other indicators of adoption.

Metric 2: Circulation

Research insights may be embodied in videos, visual models, slide decks, or other artifacts. The circulation of these artifacts, or portions of them, from one team to another is another measure of the deliverable’s impact. The application of the strategies and techniques outlined in this section is likely to end in the creation of artifacts deliberately designed for easy sharing and effective knowledge transfer. Evidence that these artifacts have been shared among teams, and even multiple projects, is a powerful metric of successful communication of design research.

Metric 3: Durability

If research stories and models are being circulated from team to team, also look for evidence that stories, frameworks, or insights still influence decisions in their original client team long after the research engagement. Some can continue to influence design decisions for years, especially if they are able to invoke an “aha” moment without external guidance.

Metric 4: Repeat Engagements

As with any consulting arrangement, the true measure of success is whether or not the client returns for another project. If this is the case, the research has likely had a positive impact that the client organization can see even if it is not apparent from an outside perspective.
CHAPTER 7. SUMMARY, RECOMMENDATIONS AND FUTURE WORK

7.3 Future research

The research presented in this dissertation leaves open many important directions for further study into the effective communication of design research.

Exploring nuances of the Principles of Persuasion and Motivation in communicating design research

This thesis examined the application of Principles of Persuasion and Motivation to Learn within design research communications, showing that some are used more extensively and effectively than others. An investigation into the application of these principles could increase their effective use.

For example, there seemed to be two processes for picking communication methods in this study. In general, a similar format was assumed across most projects: a slide presentation with quotes, photographs and possibly video. Occasionally, the research team decided to do something different, but it was not clear what spurred this diversion from the normal format, or how often these novel approaches were more or less successful. Certainly, the case studies presented in Chapter 6 could be taken to imply that novel approaches are more successful, and literature on novelty supports this idea (e.g., [15, 80, 123]). However, continually finding novel approaches is an impractical task likely subject to a high failure rate. Which leaves open the question under what circumstances (e.g., corporate culture, type of problem) is novelty more likely to be successful?

As a second example, there appears to be a division between design consultancies and research consultancies on whether it is better to be surprising and provocative, or to carefully guide clients toward the co-creation of research insights. The ambiguity over in which situations one would be preferable to the other calls for a deeper investigation into the role of surprise and guidance in inspiring and influencing design. Each of the Principles may warrant this type of examination taking into account differences in team composition, organizational configuration, and time-scale, to name a few variables.

Extending human-centered communication

The communication practices in this thesis focused on the communication of design research and assumed that the audience of this communication included designers as well as other stakeholders in the client organization. As noted, design researchers work in a range of organizational structures, and work closely with a range of other disciplines, including design engineers, project managers, industrial designers, and market research groups, to name a few. In addition, they present to stakeholders that range from developers to the highest-level executives. Given the varied situations design researchers face, examining the effects these variables have on which methods and techniques are most useful for carrying out a human-centered communication process would contribute to understanding and increasing the effectiveness of their communication practices. In addition, it would be informative to
extend the study to other aspects of the design process. For example, are similar approaches useful in other design communication situations?

The research in this dissertation was carried out with the assumption that the design research being communicated was well done and valid. Though there are measures for determining the quality of quantitative and qualitative academic research, there are no practical standards for determining the “quality” of design research. There is a need for the development of metrics that can be applied to design research as it is practiced in industry to help standardize the practice to increase the quality of insights communicated to clients.

Developing tools and methods to support human-centered communication

Experienced design researchers were found to follow a human-centered design process in the creation of their communication pieces, and to support the dissemination of research by socializing it and fostering a sense of ownership in their clients. The effectiveness of these techniques should be validated through a comparison of measures of their successful application, such as the metrics proposed above, to measures of product success and measures of how well the developed concepts meet user needs. In a similar vein, it would be useful to explore which techniques and strategies lead to the greatest increases in shared understanding between design researchers and their clients to help develop best practices in design research communication.

Though design researchers follow a human-centered communication process, they do so informally. For example, though design researchers spend a great deal of time with their clients, they do not formally analyze what they learn about the client organization in the same way that they analyze and process the information that they gather about users. Increasing the effectiveness of design research communication calls for the formal development of methods and tools to support the human-centered communication process beyond the stakeholder interview. The techniques and strategies identified in this thesis are a first step, but open the possibility of methods to support and extend them.

Design researchers almost universally view video as the second-best way to learn about users, after going out and meeting users in person. However, with the introduction of the concept of hyperreality, including the concept that perhaps people better remember the emotionally saturated and high stimulation narrative of edited video [45], does this perception still hold? At what point does a documentary inspire and teach better than fieldwork in which each individual only meets one or two users? Developing well-edited video itself is a time intensive endeavor, even with the advances in editing software, begging the question, how long and numerous must the videos be? And, are there alternatives that would be acceptable in some circumstances? Chapter 6 proposed a series of dimensions to describe design research communication methods. The development of these dimensions through a systematic investigation into how these dimensions affect the effectiveness of design research communication would help guide designers in choosing a communication medium and format.
A design researcher who works extensively on the communication of design research, R-13, mentioned that she seldom knows what other professionals do in their communication practice. Although there have been many advances, there is still no body of knowledge that can enumerate the methods of design research and design research communication or provide explanations as to how these various methods within the design process relate to each other. Such a body of knowledge would not only increase our understanding of structured design processes, but would also be an invaluable tool with which to train future engineers and designers.

The research in this dissertation motivated the concept of TheDesignExchange as a platform for the development of this body of knowledge [116]. TheDesignExchange is envisioned as an interactive web portal to facilitate the capture, analysis and widespread use of design methods. It can provide a structure within which to collect and document the many design methods in use today, their origins, how they are used, and exemplars of their use. It also could help designers make informed decisions about when to apply those methods in the design process, supporting the entire design process from Acquiring Data through Defining the Problem to Communication to Idea Generation and Evaluation providing educators and practitioners alike with a versatile library of proven tools. As a platform for collecting and evaluating methods, TheDesignExchange could help to answer a number of questions about choosing methods for human-centered design research and communication. Among others, these include:

- Which methods are useful in different situations?
  - for answering different types of questions (e.g., usability, exploratory, why, how, etc.)?
  - for the production of different classes of products (e.g., service, physical, experience, online, etc.)?
  - for differing project contexts (developing economies, enterprise solution, etc.)?

- How do different methods work together? Can design research patterns be identified?

- Given information on what is useful in what situation, what approaches can be used to guide the selection of methods for a new project?

- How are new methods created when existing methods don't appropriately or efficiently answer the research question? What factors need to be considered (e.g., human subject issues, type of data needed to answer the question, ability to turn that information into a deliverable, etc.) when developing a new method?

- How does discussion around a method change that method's definition or use?

By codifying and delineating design methods, a systematic study can be performed on how design research methods, communication methods, and design methods work in conjunction with each other throughout the design process.
CHAPTER 7. SUMMARY, RECOMMENDATIONS AND FUTURE WORK

Going beyond communication

This thesis examined an important design activity – the communication of human-centered design research results – which is not well understood or integrated into regular design practice, as was suggested by the analysis of design process models. However, communication was not the only activity that is not well integrated into design process models. Both Project Management and, especially, Reflection on Practice were poorly represented in the design process models surveyed, as shown in Table 2.3. The study of the design process would benefit by a similar examination and integration of these activities as the one presented in this thesis.

Though there is still quite a bit to be understood about the design process, this thesis has added to that understanding by illuminating the process of communicating design research results to designers and other stakeholders. Through formalizing and integrating the communication techniques outlined in this thesis into their regular work practice, design researchers can craft design research communications that are more actionable, increasing the impact of their research on design decisions and outcomes – ultimately resulting in products that better meet the needs of society.
Bibliography


[54] *Flickr from Yahoo!* URL: [www.flickr.com](http://www.flickr.com).


[120] Paul Rozin, Linda Millman, and Carol Nemeroff. “In many ways, both types of questions act as forewarning of the content to come – by asking the question, the audience is informed that an answer, likely a controversial one, will be given, cuing them to pay attention.” In: Journal of Personality and Social Psychology 50.4 (1986), pp. 703–712.


[152] YouTube. URL: www.youtube.com

Appendix A

Discussion Guides for Interview Study

Note that the following discussion guide constitutes example questions which might be asked of members of each group, though the actual interviews varied depending on the flow of the conversation.

General Questions

- Can you tell me what your company does?
- Please tell me about your role in your company.
- Would you walk me through the development process for the last, or a current, project that you worked on?

Questions for Design Researchers

- How did you define the scope and purpose of your fieldwork?
  - How did you choose tools and methods for your user research?
  - Can you tell me about a time when this process was especially difficult?
- Who goes out to conduct fieldwork?
  - Can you tell me about a time when this didn’t go well?
- What information do you share with your group and how?
  - What information do you not share with your group?
- How do you communicate what you find with the people that will develop the design?
  - How did you decide on the format?
  - Who are you designing the communication for and/or with?
– How do you decide what to include or exclude from your communication?

• How do you determine the success of your user research?
  – What kind of feedback do you get on how useful the information you provide is?
  – How do you get that feedback?

• To what level is the client or design team involved in each step?

Questions for Designers

• What is a projects meeting schedule like, both formal and informal?
  – What are the outputs/goals of the meetings?
  – Can you walk me through your thought process as you prepare for that meeting?

• What information do you share with your group and how?
  – What information do you not share with your group?

• How did your team decide on the direction for your last project?
  – Can you tell me about a time when deciding on a direction was especially difficult?

• Have you had user research input into any past projects?
  – How was it delivered to you? Was that effective in your opinion?
  – How do you share your understanding about your users with others on your design team?
  – Do you ever reference the research? If so, how?
  – Do you ever need more information about users? If so, how do you get it?

• How do you feel about user research?
Hi, my name’s Genevieve Bell, and I wanted to talk to you for just a little bit about Intel’s Smart Television Initiative.

I wanted to start by reflecting on the kind of methods we use here. So our work has been intensely grounded in research social science and design methods. That means we spend time in people’s homes, we get a sense of what makes them tick, we spend time all over the world, with people, sitting on their sofas, watching television with them. And as we’ve done that work over the last five years, there’s a couple of things that have really emerged for us.

First is that people love their televisions because their simple. People like the fact that television is one button to a story you care about, it’s one button to something that is pleasurable. And for the most part it doesn’t require a lot of work for you. When television is at its best, television is something you can just experience and enjoy.

The second thing when we think about television globally, when we look at the kind of work we’ve done, is that people love television because it’s also incredibly flexible. Television can be all sorts of things to all sorts of people: it can be how you babysit your kids, even if we don’t want to admit to that; it can be something that you do when you come home in the afternoon and you wanna relax; it can be watching football with all of your mates and connecting to a larger set of experiences. It’s all of those things, and television doesn’t have to change to be that.
And last but not least of the things we know that people really love about TV is that it’s also really social. So whether it’s you sitting down with your buddies watching football, or whether it’s watching children’s television with your kids, or whether it’s the fact that television gives you something to talk about the next day in the office or tonight online. Television is all about delivering a social experience.

So for us, those things are our buy words: it’s got to be simple, it’s got to be flexible, and it’s got to be social. When we think about what it is you do with those things for television moving forward, how do you make those things better, for us, is what Smart TV is all about, and it’s always really grounded in this rich understanding of people and their everyday practices.

So we spent today meeting with some of the bloggers here and we were talking about the future of television, which is something I’m particularly passionate about right now. And it’s obviously a really good time to be talking about that.

When I think about where the future of television is going, for me it’s really important to think about the present of television. And one of the joys of being an anthropologist and a research social scientist is that I get to spend my time in people’s homes getting a sense of what makes them tick and what they care about. And over the last ten years we spent a bunch of time talking to people about TV: about why it’s important to them; about why they care about it; in the words of one woman, “why television is better than chocolate.” And as we started to kind of go through that material, it’s really clear to me that there’re kind of three things that stand out about why it is that people care about TV.

One is that it’s incredibly simple. Television is one button to a story you care about; it’s one button to relaxation and escape. It doesn’t require you to have to do a lot of work. So incredibly important that television be simple.

The second thing that’s really clear to us as we’ve talked to people about TV, is that television is about being social. Whether it’s watching TV with your friends, bringing a whole lot of people over to watch the Super Bowl or watch us get beaten in the cricket, it’s all about an experience of being with other people and sharing something that’s meaningful or at least fun.

But I also think television is social in another way, right? It gives us something to talk about with other people. It gives us stories to connect around, story lines to connect around, decisions by judges on reality TV shows to argue about, and it
creates the fodder and glue for everyday social interactions. So TV is important because it’s social.

And then last but not least, I think one of the things people really care about television is that it’s flexible. Television can be anything. It can be a movie, it can be a game, it can be the way you babysit your children though you probably wouldn’t admit it. It can be the place you go on a Friday evening just to watch trash and kind of “veg out” as someone once put it to me. I mean it’s all of those things, right?

So when we think about what the future of television looks like, for us we know it’s got to to adhere to those kind of social rules: it’s got to be simple, it’s got to be social, and it’s got to be flexible. And when we look at the future there and we start to think about, what does it mean to bring the internet to television? what does it mean to have new kinds of platforms next to your television? what does it mean to talk about something like smart TV? For us, it’s really important to think about the persistence of television. People watch more TV now than they did 10 years ago. The average American household is still watching about 20 hours of TV a week - it’s gone up considerably in a decade. We spend five times more hours watching television than we do online. So it’s still a dominant platform for entertainment, information, for the things that we care about. Which means that there’s this huge opportunity to do things there: to bring the internet, to bring new content, to create new sorts of experiences. And all of that stuff? All that stuff is really exciting. So you should stay tuned because there’s more to come.

On Mobile Etiquette, October 2011
Europe, Middle East and Africa survey opening statement
http://www.youtube.com/watch?v=3HaAdeKnrFk
2:02 minutes

Hi, my name is Genevieve Bell and I’m the Director of Intel’s Interaction and Experience Research Labs. What that really means is I get to spend a lot of time hanging out in people’s homes getting a sense of what makes them tick and what they care about, and of course, how they use new technology.

As part of that, one of the things I’m really struck by is the fact that where we are as a society, as a culture, as lots of cultures around the world in fact, we haven’t quite caught up to all the technology that’s in our lives. So, All sorts of things have become pervasive in the last ten years: the internet, mobile phones, laptops. And I think sometimes we haven’t actually worked out what all the rules should be.

So thinking about etiquette, thinking about the way we manage our social relationships around these new technologies it is no surprise to me that a lot of
things are still in flux. Over the last three years at Intel, we have done a series of surveys globally at this point, trying to get a sense of how people’s relationship to technology and their sense about what the rules should be is changing, or not. And what’s been really interesting as we’ve seen that data shift over the last three years is the places where we’ve seen really big changes and the places where things remained the same.

Unsurprisingly, we are still concerned and annoyed by the way people text while driving, by the fact that people text at the dining room table, the ways that people overshare on social networking sites – sometimes about us. And, you know, we all still worry about what people are doing when they take their mobile phones to the bathroom.

And by the same token, there are a whole lot of things that have changed. In some ways our boundaries for thinking about where technology may bear down in our lives really has shifted. We are much more willing to imagine taking a laptop away for a holiday weekend, we’re much more willing to imagine that you might actually have a phone in a movie cinema, or on an aeroplane.

And I think we’ll keep seeing those things shift as we work out our relationships here, because after all, while the technology is relatively new, these are long standing social rules we’re trying to work through, right. And for me, etiquette is always going to be in flux as we negotiate those things.