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The "Re-emergence" of Ethnography in Industrial Design Today

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Abstract

During the past decade, ethnographic research has increasingly become a vital part of industrial design. Many of today's design projects require designers to seek fresh ideas in the real world where people interact with products and systems The results have generally been noteworthy. Contemporary design literature includes numerous case studies illustrating how ethnographic research has sparked the discovery of innovative, useful and profitable product concepts.

This paper explores why ethnography has become such a "hot" topic in industrial design today. It looks at the origins of ethnography in design (found in the work of Henry Dreyfuss, Robert Probst and William Stumpf) and postulates that its "re-emergence" in the 1990s is attributable to four key factors:

Ethnography links designers to users.

Making this connection has become increasingly important in a global community where significant physical, cognitive and cultural distances separate designers from users.

Ethnography helps clients succeed in a competitive marketplace.

In a marketplace characterized by unpredictable consumer preferences, manufacturers and businesses need methods like ethnography to develop products that people genuinely value, need and want.

Ethnography supports growth in industrial design.

Product planning is becoming a key part of the service industrial design groups provide to clients and companies. As a part of this service, ethnographic methods are used to imagine and identify exciting new product ideas and business opportunities.

Ethnography enhances a designer's creativity.

Research into the nature of creativity (conducted by Jacob Getzels, Mihaly Csikszentmihalyi, Mark Runco and others) has shown that "discovery-oriented" processes lead to qualitatively superior creative results.

Paul Rothstein

Paul Rothstein is an Assistant Professor in the Industrial Design Department at Arizona State University. Winner of the IDSA's Gianninoto Scholarship, the Fahnstrom/McCoy Product Design Fellowship and a Graduate Scholarship from the Illinois Institute of Technology, Paul received an MDes from the Institute of Design at the Illinois Institute of Technology in 1998. While there, he explored a human-centered product planning and development methodology that integrated multiple research methods, a structured analysis of data and behavioral prototyping. Prior to studying at IIT, Paul was a program manager and senior industrial designer with Polivka Logan Design (PLD) in Minneapolis, MN. During his six year career with PLD, Paul was responsible for leading and managing multidisciplinary design teams in the development of products for clients in consumer, medical, industrial and computer markets, including: Cray Research, Caire, 3M, InTeg, and Medtronic. He was also responsible for developing a user research methodology and a variety of corporate product-design strategies. Paul has published articles on environmentally responsible design and universal design. His current research

agenda at ASU involves exploring the relationship between user-centered design, creativity and product innovation as applied to design education and practice.

The "Re-emergence" of Ethnography in Industrial Design Today

I have washed clothes, cooked, driven a tractor, run a diesel locomotive, spread manure, vacuumed rugs, and ridden in an armored tank. I have operated a sewing machine, a telephone switchboard, a corn picker, a lift truck, a turret lathe, and a linotype machine. When designing the rooms in a Statler hotel, I stayed in accommodations of all prices. I wore a hearing aid for a day and almost went deaf. I stood beside a big new gun at Aberdeen Proving Grounds when it was fired, and was catapulted off my feet. Members of our office have spent days and nights in airport control towers and weeks on a destroyer during maneuvers. We ride in submarines and jet planes. All this in the name of research! 1

Henry Dreyfuss

"The mystique of field work - the magical properties of the term, the mysterious aspects of the work involved, the wonderful transformations that occur through living and working "in the field" - never disappears" 2

Morris Freilich

". . . creativity does not happen inside people's heads, but in the interaction between a person's thoughts and a sociocultural context. It is a systematic rather than an individual phenomenon." 3

Mihaly Csikszentmihalyi

Introduction

In *Designing for People* , published in 1955, Henry Dreyfuss suggested that field research is fundamental to successful industrial design. His opinion was based on the simple recognition that industrial design is about helping, assisting and delighting people. To remind himself of this

basic fact, Dreyfuss reputedly kept the following statement posted in his office:

"What we are working on is going to be ridden in, sat upon, looked at, talked into, activated, operated, or in some way used by people individually or en masse. If the point of contact between the product and the people becomes a point of friction, then the industrial designer has failed. If, on the other hand, people are made safer, more comfortable, more eager to purchase, more efficient - or just plain happier - the designer has succeeded. 4

To accomplish the goals embedded in this statement, Dreyfuss advocated using a variety of research methods, including investigation in the field. He suggested that studying people in the environments in which they eat, work, sleep and play is an integral part of the design process and the most effective (if not only) way to design useful, delightful and profitable products.

In spite of Dreyfuss' early advocacy, field research did not become a common part of industrial design during the ensuing forty or fifty years. In fact, there are relatively few examples of projects during this period that include credible field research. Of the millions of projects completed during the past half century, the vast majority have been designed without designers ever setting foot in the environments where people, daily life and products collide.

Things may be changing, however. During the past decade, there has been a noticeable resurgence of field research in product design. In fact, a growing number of design groups promote field research as one of their "core competencies." This includes influential consultants like IDEO and Fitch along with large global manufacturers like Steelcase and Motorola. More important, however, small regional design offices are also selling and conducting field research. This points to an industry-wide trend and clearly suggests that field research is becoming a standard part of design. Consider, for example, Brooks Stevens Design (BSD), a small office located in Grafton, Wisconsin. On a recent project involving the design of a new stroller for Gerry Baby Products, BSD spent considerable time studying parents and children. In BSD's own words, "We high-tailed it to the zoo, mall and park to observe

strollers in the wild."[5] The insights gained from this work, according to BSD, led to ". . . a new degree of innovation."[6] evidenced in features like one-handed steering, a removable snack tray and a handy bottle holder.

The adoption of field research in industrial design raises a number of key questions. For example, how has field research evolved during the past fifty years? Who are some of the leading figures? Why is it re-emerging at this particular point in time? And how specifically does investigative research in the field benefit designers, clients and users?

This paper explores answers to these and other related questions. It argues that field research in industrial design has matured significantly during the past decade due primarily to the adoption and modification of traditional theories and methods found in anthropology and ethnography. Further, the paper suggests that four specific factors are fueling the re-emergence of ethnographic field research in the 1990s:

• it links designers with users.

• it helps clients succeed in a competitive marketplace.

• it supports growth in industrial design.

• it enhances a designer's creativity.

The Origins of Field Research

In the last decade or so, there has been a recognition that field research in industrial design shares many similarities with field research in anthropology and ethnography. In retrospect, it is not surprising: all three disciplines involve the study of culture, artifacts and human behavior.

As new kids on the block, design researchers have "mined" anthropology and ethnography for theories and methodologies relating to field studies. It has been a unique and productive opportunity - design researchers have had the luxury of sorting through the vast knowledge and experience that anthropologists and ethnographers have generated during the past hundred years. Adapting all of this to design has resulted in the development of well-defined and innovative research methodologies by design

groups at Fitch, Design Science, E-Lab, IDEO and others.

But what, exactly, have design researchers "extracted" from anthropology and ethnography? What have they found in these social science disciplines that apply so effectively to field research in industrial design? And what are the commonalties?

Field research is about studying culture and human behavior

The Heritage Dictionary succinctly defines anthropology as the "study of the origins and of the physical, social and cultural development and behavior of humankind." As suggested, anthropology encompasses a broad spectrum of concerns and interests. The ones that are particularly relevant to industrial design involve the links between culture and human behavior. Stephen B. Wilcox, a principal at Design Science and the author of Why *Anthropology /A Tool For Design Research*, notes that cultural anthropology and industrial design are a "natural fit."7 Wilcox defines culture as ". . . the world view and behavioral tendencies that we develop, for better or worse, throughout our lives from school, friends, TV, where we work, the clubs we belong to, what we read and any number of other sources. Culture is the name we give to those characteristics that are shared with the groups to which we belong."8 According to Wilcox, studying culture is important in industrial design because it provides insight into the factors that motivate people to want, purchase and use a product. "We should be concerned about the study of culture," Wilcox notes, "for one central reason: It is the primary determinant of what people buy and how they like it."9

A good example of how the study of culture and human behavior translates to contemporary product design can be found in *anthronomics*, a field research methodology developed by Rick Robinson and Jason Nims at E-Lab. Anthronomics is a set of methods, including video ethnography, experiential sampling and cultural inventorying, that is employed to help design researchers discover the "meaning" people ascribe to activities, environments and things. "A successful product," Robinson and Nims note, "must be designed around how people will use it and the meaning they attach to it . . . Designing

for what matters to real people results in things that people will value. Discovering what matters is what anthronomics accomplishes."[10]

Field Research is part art and part science

The history of anthropology suggests that studying culture, social interactions and human behavior requires a researcher to navigate between apparent opposites: between intuition and reason, imagination and logic, and spontaneity and method. This is caused by the fact that studying people involved in daily life is fundamentally "messy." Anthropologists, along with other social science researchers, have learned that people and daily life do not readily conform to dogmatic inquiry methods. Morris Freilich, an anthropologist and the editor of *Marginal Natives at Work: Anthropologists in the Field*, postulates that anthropologists contend with this problem by recognizing field research as both a mystery and a science. It is a mystery because it fundamentally involves a great deal of uncertainty in terms of context, accessibility, changing events and even a researcher's abilities. For example, Freilich notes that researchers face significant challenges when beginning field work. "No specific techniques exist," he writes, "to help the young ethnographer transform a group of hostile natives into friendly informants; no specific and operationally useful rules exist for obtaining valid data; no program exists for translating raw data into information that is meaningful for anthropological analysis; and no specific techniques exist for drawing predictive generalizations from such information."[11] To succeed, the researcher will need to draw upon personal abilities and characteristics, rather than relying solely on methods or techniques.

Freilich also recognizes, however, that field work is science. He argues that adherence to a scientific method introduces a necessary measure of rigor and objectivity to counterbalance the intuition and interpretation of "field work as mystery. Specifically, the scientific part involves applying techniques and procedures that have been developed and tested over time, including: traditional methods of observation and interviewing, life histories and genealogies, controlled experiments, and careful research design.

Freilich maintains that mystery and science

coexist in field research in spite of obvious incongruities and inconsistencies. "All anthropologists," he notes, "are committed to *some* aspects of the field-work-as-science complex, and most of them are also strongly attached to the field-work mystique. Somehow, these two somewhat contradictory complexes remain part of the field-work culture."12

Field research involves a method

Field research in industrial design generally involves the application of ethnographic research methods and processes. Originally developed by ethnographers to conduct long-term studies of 'primitive' people, these methods include techniques and procedures for organizing a research study, collecting information and analyzing data. Martyn Hammersley and Paul Atkinson, co-authors of *Ethnography: principles in practice*, define ethnography as follows: "We see the term as referring primarily to a particular method or set of methods. In its most characteristic form it involves the ethnographer participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions - in fact, collecting whatever data are available to throw light on the issues that are the focus of the research."13

A typical ethnographic study is comprised of four distinct phases:

1. Designing the Research: involving the identification of research problems, pilot site visits, and the development of sampling strategies.

2. Collecting Data: involving the use of specific investigative methods to collect information relevant to the research problem. Ethnographic methods generally fall into three categories: observational methods; interviews and questionnaires; and miscellaneous methods for collecting documents, records and other types of written or visual data.

3. Analyzing Data: involving the organization of data, the development of coding schemes, the generation of conceptual frameworks, and the development of descriptive typologies and theories.

4. Reporting: involving the presentation of information, interpretations and conclusions.

Field Research is an Emergent Process

As a qualitative research method, contemporary researchers argue that ethnography should be understood as fundamentally iterative and emergent rather than linear and self-evident. Hammersley and Atkinson note, for example, that the emergent nature of ethnography is present from the very beginning: ". . . the formulation of precise problems, hypotheses, and an appropriate research strategy is an emergent feature of ethnography. This process of progressive focusing means that the collection of data must be guided by the unfolding but explicit identification of topics for inquiry."[14]

As suggested, ethnography requires a continual adjustment to changing conditions and new information. The process is highly exploratory and interpretive. This is not detrimental according to researchers like Colin Robson, author of *Real World Research*., as long as the interpretation is naturally evolving and emerging from the research. Robson notes ". . . that theories and concepts tend to arise from the enquiry. They come after data collection rather than before it. Because of this, it is often referred to as a 'hypothesis generating' (as against 'hypothesis testing') research. Also, in the interpretive approach, data collection and analysis are not rigidly separated. An initial bout of data collection is followed by analysis, the results of which are then used to decide what data should next be collected. The cycle is then repeated several times."[15]

Early Examples of Ethnographic Research in Industrial Design

Henry Dreyfuss

In *Designing for People*, Henry Dreyfuss took on the challenge of explaining industrial design to the mass public. He suggested that the embryonic profession involved satisfying a few fundamental concerns. "Industrial design," he wrote, "is a means of making sure the machine creates attractive commodities that work better because they are designed to work better. It is coincidental, but equally important, that they sell better."[16] Embedded in this statement is the

recognition that aesthetics, function and market competitiveness are the primary characteristics of industrial design. Though written over fifty years ago, these characteristics continue to define the profession today.

Dreyfuss argued that a successful design starts with a designer's willingness and ability to conduct research. "It may seem to some," Dreyfuss noted, "that the designer lays claim to a special omniscience, an infallibility, through which he blithely presumes to offer a solution to any problem. He makes no such claim. He takes pride in a skill based on experience and an alertness sometimes interpreted as vision. He approaches every problem with a willingness to do painstaking study and research and to perform exhaustive experimentation."[17] To support this argument, he goes on to describe specific types of research he and his colleagues conducted, the most famous of which was ground-breaking in the area of anthropometrics. This body of research was eventually transformed in 1960 into a book titled *The Measure of Man* which, along with Niels Diffrient's *Humanscale Atlas*, presented hard data about designing products and machines to fit people's physical features and characteristics.

Interestingly, Dreyfuss also advocated the use of research to gain insight into the less tangible aspects of human behavior and needs. He referred to these as "consumer preferences."[18] and fully recognized the key role they played in determining the acceptance or rejection of a new product. To study these preferences, he suggested using field research or, in today's terminology, ethnographic research. Consider, for example, the following passage:

I have washed clothes, cooked, driven a tractor, run a diesel locomotive, spread manure, vacuumed rugs, and ridden in an armored tank. I have operated a sewing machine, a telephone switchboard, a corn picker, a lift truck, a turret lathe, and a linotype machine. When designing the rooms in a Statler hotel, I stayed in accommodations of all prices. I wore a hearing aid for a day and almost went deaf. I stood beside a big new gun at Aberdeen Proving Grounds when it was fired, and was catapulted off my feet. Members of our office have spent days and nights in airport control towers and weeks on a destroyer during maneuvers. We ride in

submarines and jet planes. All this in the name of research! 19

This quote clearly illustrates that Dreyfuss understood that studying people in the environments where they live and work is fundamental to successful product design.

Though he offers no specific details, we can safely assume that (in his opinion) the results of his research led to the design of more useful and successful machines, products and environments.

It should be noted that Dreyfuss was not blind to the limitations of research into human behavior and needs. He clearly understood, for example, that field research - even when conducted professionally and with good intentions - did not guarantee success, either in the understanding of people or in the design of a successful product. In fact, he admitted that "Research in itself can be treacherous and misleading."20 He specifically noted a concern for the ever-present problem of people altering their behavior and verbal responses to please or impress researchers. This tendency - which Colin Robson, author of *Real World Research* , refers to as the "social desirability response bias"21 - has the potential to sidetrack a designer's understanding and, thus, the integrity of a design solution. While admitting obvious limitations, Dreyfuss argued that well-conducted field research was critical to successful product design. He summarized his position by stating:

"It is not simple to appraise consumer preferences while a contemplated article is still a sheaf of "not quite" drawings in the designer's office. There is such a thing, however, as having a staff whose taste is cultivated and sense of order are kept razor-sharp, to the point that planning ahead, always hazardous, can almost be reduced to calm logic. This is not to state that there is any such thing as industrial prophecy; only that the industrial designer is qualified by experience, observation, and research to suggest in advance what a product should look like . . . The process consists of painstaking research, distilling it into its essence, then translating it accurately into the final product. This is what the client pays for and what he is entitled to receive." 22

Robert Probst

Another early advocate of field research in industrial design was Robert Probst. Best known for his work with Herman Miller in the 1960's, Probst collaborated with Joseph Schwartz and George Nelson in the development of the revolutionary Action Office.

In 1968, Probst became president of the Herman Miller Research Corporation (HMRC), a subsidiary that provided research services to companies interested in a deep exploration of design problems and solutions. During this period, Probst developed what he called "open-ended research," which was an on-going process of "rebuilding, re-analyzing, and on-the-spot observation."[23] Open-ended research, according to Probst, enabled designers to fully explore problems prior to developing solutions. It gave them the opportunity to "seek out problems and cause things to happen, to exert continuing influence on project development from the early stages of problem definition and research through final production."[24]

Although Probst did not refer to "open-ended research" as ethnography, it was nonetheless an essential part of what he was practicing and advocating. Consider, for example, a program that Probst and his researchers conducted to explore the design and management of hospital interiors. Patricia Conway, the author of *Industrial Design USA: Human Systems*, notes that Probst's procedure included "ten years of exhaustive research and development, the first year and half of which was devoted to problem search and definition uninhibited by preconceived ideas . . . During this period, Probst's staff prowled around hospitals documenting everything from traffic patterns (what moves? when? where to? randomly? on schedule?) to the size and contents of the suitcases patients bring with them."[25]

Ethnographic methods also showed up on a project Probst conducted later called the Bendix Experiment. In this case, the project focused on studying the interaction between office workers and the design of a digital work environment. Probst's approach included: discrete observations of activities in a programmer's existing work space (captured with a camera); interviews with the programmer to explore the meaning of specific actions recorded on film; and the use of a variety of analysis methods. The results were

used by Probst's design team to visualize a new prototypical work environment. After fabricating and installing the prototype, the entire research and analysis process was repeated. The research culminated in the development of specific criteria for the design of data processing components that eventually became part of Action Office 2.

Interestingly, Probst was also one of the early advocates for using cameras as primary investigative tools. In fact, he and his colleagues developed a technique they called "grab shooting" which involved using high-speed film to capture people and activities in real time. Probst clearly understood the unique value cameras provide in ethnographic work to capture what people actually do in real life, rather than what they say they do. "People's dialog with the environment is fanciful," he noted, "and photography dispels fancy."[26]

Bill Stumpf

Bill Stumpf recalls that George Nelson once advised him to "Study life, not just design."[27] This simple nugget of wisdom, freely provided to Stumpf at an early age, helped Stumpf shape a career and reputation based on the design of innovative products that support people's daily lives.

In *Design Sleuthing: A Useful Research Approach*, Stumpf identifies "sleuthing" as an appropriate metaphor to describe the research activity that is most meaningful to industrial design. Over the course of his career, he notes that he gradually came to realize ". . . that design consists largely of detective work. More germane to a well-designed product than theories or design briefs from marketers and engineers is the kind of search conducted by sleuths, from Sherlock Holmes to Miss Marples, for clues the underlie even the stated opinion of consumers."[28] Later in the article, he confesses that "All the work I do involves detective work, which leads to my reaching a basic level of truth about the way people work, play, sleep, travel, take baths, and so on."[29]

To reach that "basic level of truth," Stumpf employs a method that is distinctly ethnographic. It includes observation, interviews and the careful analysis and interpretation of data. He specifically identifies observation as the most

valuable tool to a "design sleuth," a conclusion he initially reached while working in the early 60's on a project involving the design of a nuclear fallout shelter. As a part of the project, the US. Defense Department invited the development team (of which Stumpf was a member) to spend two weeks observing sixty naval cadets living in a two-thousand-square-foot underground shelter. The experience was transformative. Stumpf notes that the insights he gained from the observation ". . . could not have emerged from the seat-of-the-pants design practices that I had been taught. Where my previous experience would have been good for the shelter's interior design, now I was dealing with life-sustaining issues such as air quality, humidity, and temperature. Where previously I would have been involved in designing the shape and color of toilets, now I found myself dealing with the psychological effects of toilet flushing. The sound of toilets being flushed around the clock in such a small living environment nearly drove those on their eight-hour sleep shift crazy."[30]

That experience, according to Stumpf, resulted in him becoming a vocal advocate of field research. Observations and interviews became a key part of the way in which he designed products. While designing an urban bicycle, for example, he spent time in the field interviewing bicyclists about their habits, motivations and needs. Later, he spent considerable time studying people in office chairs. With the help of time lapse photography, he was able to conclude that people never really stop moving while seated in a chair. This insight led directly to the development of a series of award-winning office chairs for Herman Miller. Finally, Stumpf cites a project that involved the design of new seating for Amtrak's cross-country trains. Consistent with his approach, the project involved traveling ". . . thousands of miles on Amtrak trains, sleuthing, observing, and photographically notating day and night behavior. If we had not been on these trains for long hours observing people trying to satisfy a variety of needs and attempting to achieve a level of comfort, we would have missed many of the good and bad aspects of long-term train travel, and our designs - and therefore passengers - would have suffered accordingly."[31]

It should be noted that Stumpf is highly critical of what he refers to as the "pseudo-scientific intellectualization of design problems."[32] This is

likely the reason that he does not present a well-defined or overly complex research methodology. Instead, he suggests that research in industrial design involves using readily accessible methods (e.g., looking, questioning, taking notes and shooting photographs) to gain a deep understanding of people and daily life. To Stumpf, research is less about the application of rigorous methods than about enlightened interpretation. In this sense, he champions design research as more art than science. This often entails digging beneath the surface of appearances and research findings to get at the truth. Stumpf concludes that there is a poetry to design research, an intuitive process that leads to an understanding of, what he calls, the "unmeasurable aspects."[33] of people's daily lives.

Dreyfuss, Probst and Stumpf are equally responsible for establishing field research as an essential part of designing products. Knowingly or unknowingly, the methods they advocated to conduct their research spring from ethnography, including: observations and interviews; the use of cameras and other documentation technologies; and the careful analysis and interpretation of data observed in the field. Their contribution is evidenced today whenever a designer or design team ventures forth with camera in hand to document and study people as they work, sleep, eat and play.

Conjectures: why ethnography is "re-emerging" today

With influential designers like Dreyfuss, Probst and Stumpf advocating ethnographic research in industrial design, one might naturally assume that it became an essential part of how design is practiced. This did not occur, however. In fact, the vast majority of projects during the past fifty years have been completed without designers conducting even a minimal amount of field research. Bill Stumpf, who became all too familiar with this "researchless" approach to design early in his career, notes that typical projects ". . . were rarely based on criteria, constraints, materials, or context of use . . . I was arriving at design solutions that came from some mythical resource in the sky. Design productivity in that atmosphere was measured by the number of ideas we form-givers could generate in time to meet early deadlines. Conference room walls were filled with sketches showing numerous

subtle form remarks around a theme, a theme generally cozy with the previous year's design trends described in the professional design journals, namely *I.D. Magazine*."[34]

Robert Probst was even more direct and critical. He warned that designing products without conducting research was relegating the profession to a superficial role. "Unfortunately," Probst lamented, "industrial design attracts a lot of 'surface' people interested only in cosmetics; to quote Raymond Lowey, most design students are 'toadstools.' Those with real talent - the strong, vital thinkers - are falling over into the social sciences. On more and more projects, particularly at the institutional scale, the important decisions are being made by anthropologists, sociologists and economists. These people are really today's designers in disguise."[35]

Stumpf and Probst might be inclined to revise their opinions today. They would likely rejoice in the fact that more and more design groups are adopting ethnographic research as an essential part of their design methodologies. Although it is still not universally practiced (nor should it necessarily), ethnography has clearly emerged as one of the most significant and transformative developments shaping industrial design today.

But why now? Why is ethnographic field research suddenly such a "hot' and important trend in industrial design today? And what exactly is driving its steady adoption? The answer to these questions is found in a set of four interrelated factors:

Ethnographic research links designers and clients with users and customers.

> During the past few decades, manufacturers and businesses have painfully discovered that developing products without understanding users often results in failure in the marketplace. Enlightened companies have responded by seeking ways to obtain more information and insight about users prior to developing new products. The trend has even been reduced and purified into a simple managerial mantra: "Get close to the customer."

Ethnographic research has proven to be a powerful way to address this mantra. This should not be surprising since field research, at least in a design context, is fundamentally about studying and understanding people's needs, wants and expectations. By focusing on the user, ethnography provides business and manufacturing with an invaluable link to users and customers.

A good example of a design group helping a company connect with users is a project GVO, Inc. conducted for SC Johnson Professional (SCJP) in 1998. The project involved the design of the J-Fill dispensing system, a handheld mobile platform of dispensers and cleaning concentrates sold worldwide. According to a case study written by Blake Wharton, SCJP was faced with increasingly aggressive competition in a market that it had traditionally dominated. "SCJP also understood," Wharton notes, "that, in spite of its leadership position, it did not offer a unique product . . . The choice was clear: innovate, or see its position in the marketplace begin to erode."[36]

GVO proposed a development program that featured extensive ethnographic research. This eventually involved ". . . three months, 11 countries, 25 cities, 70 facilities and more than 100 interviews."[37] It included the design team cleaning hotel rooms, fast-food restaurants, banks, schools, grocery stores and mental hospitals. The result was a fresh understanding of SCJP's customers and the identification of valuable insights and criteria. Perhaps the most important of these was the discovery that the way in which SCJP traditionally segmented its customers (i.e., into distinct industry-based categories like hospitality, education, retail and healthcare) was no longer

meaningful. Instead, the design team discovered that the boundaries between these categories had, in fact, functionally eroded and disappeared. In today's world, "commercial cleaning had quietly evolved from a centralized, station-based process into a nomadic activity."[38] In short, commercial cleaners had become highly mobile and in need of new transportable tools and systems.

With this insight clearly articulated, GVO and SCJP developed a unique portable concentrate dispensing system called J-Fill. The most important feature of the system is that it allows cleaners to transport and accurately dispense a variety of concentrates in the field. This indirectly helps cleaning companies - i.e., SCJP's customers - by reducing the time and effort cleaners waste retrieving basic supplies and diluting concentrates inaccurately. Wharton notes that the strategy of satisfying cleaners' needs while reducing fundamental labor inefficiencies seems to be working: "SC Johnson Professional has reported that its key competitors are having a difficult time responding to the success of J-Fill."[39]

Ethnographic research helps companies succeed in a competitive marketplace

As the example of GVO and SCJP illustrates, ethnographic research helps companies develop innovative new products based on understanding users and context of use. In today's competitive market, the importance of innovation and product development cannot be overestimated. In fact, Robert G. Cooper, author of *New Products: The Key Factors in Success*, notes that ". . . the ability to develop and launch new products successfully and quickly is the key to business success in the 90's."[40] Accomplishing this critical task, however, is not necessarily simple or

straightforward. Cooper's research, which involved retrospectively studying the market performance of over 200 new technology products manufactured by 125 firms, clearly revealed that new product development is indeed a risky venture. "New products," Cooper notes, ". . . fail at an alarming rate; an estimated 33% of new products fail at launch; while only one in four results in a successful product. Further, about 46% of the resources that US. industry spends on product development and launch goes to unsuccessful ventures; and 63% of senior executives are "somewhat" or "very disappointed" with the results of their firms' new product programs."[41]

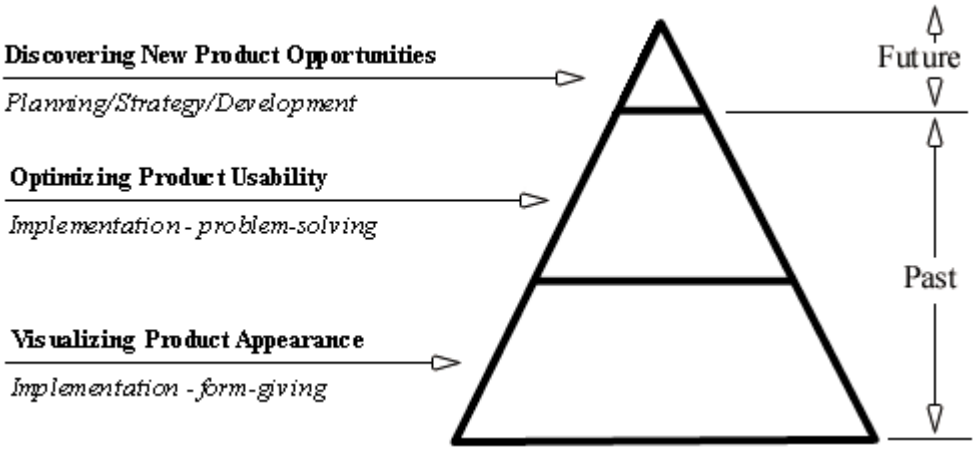
According to Cooper, survival in the marketplace requires companies to develop products that possess what he called the "Key Factors Underlying Success." Interestingly, the most important of these relates directly to users. The number one factor underlying success is: "A superior product that delivers unique benefits to the user."[42] This type of product, according to Cooper, features a cluster of characteristics comprised of meeting customer needs, solving customer problems, reducing customers' costs and providing innovative solutions. Cooper found conclusive evidence that products possessing these characteristics dramatically outperformed the competition. For example, while comparing the top 20% of superior products with the bottom 20% of "undifferentiated" or "me too" products, Cooper discovered that superior products "had an exceptional success rate of 98% versus only 18.4% for undifferentiated ones; had a market share of 53.5% versus only 11.6% for "me too" new products; had a rated profitability of 8.4 out of 10 (versus only 2.6 out of 10 for undifferentiated products); and met

company sales and objectives much more so than did undifferentiated products."[43]

Ethnographic research supports a 'growth area' in industrial design

In recent years, design consultants and corporate design groups have become more involved in product planning and development. Mark Dziersk, Vice President of Herbst Lazar Bell Inc., noted this trend in an article he wrote for the 1998 IDSA National Education Conference. Titled *The Development Model - The New Definition of Industrial Design*, Dziersk argues (among other things) that industrial designers are increasingly involved in helping clients visualize, plan and design products that support and satisfy customer needs, wants and expectations. He notes that these activities have ". . . broadened our scope, opened up our worlds and our minds . . . and made industrial designers more important to the practice of developing products than ever before."[44]

The increasing involvement of industrial designers in product planning and development suggests that a new model of industrial design is emerging. Though still evolving, the model appears to be shaping up as per the following diagram:



As illustrated, the traditional

activities of problem-solving and form-giving will likely remain vital parts of the profession far into the future. In fact, if either activity were removed today, most design offices would quickly fold. That being said, the profession is noticeably expanding into areas relating to planning and strategy. This is evidenced most dramatically by the large number of design offices that now include strategic design, product development and product planning as core competencies. Lou Lenzi, the Chair of the 1997 Industrial Design Excellence Awards Jury, recognized this trend in the *1997 Innovation Yearbook of Design Excellence* . He noted that ". . . design organizations are now applying their problem-solving skills to address overall strategic business issues. Here the design team represents a new group of generalists helping businesses think differently about these challenges, providing new insights, solutions and leadership."[45] Bruce Nussbaum, the design editor of Business Week, reaches a similar conclusion. He contends that the expansion of industrial design into product planning and development represents a "new golden age of design." He encourages designers to take advantage of the opportunity, noting that they " . . . have the keys to the innovation culture companies desperately need in the 90's."[46]

The "innovation culture" that Nussbaum refers to is nourished, at least in part, by ethnographic research. This is particularly true on projects involving the discovery of new product opportunities. In these cases, ethnographic methods help design teams imagine products that do not yet exist. Dorothy Leonard and Jeffrey F. Rayport, co-authors of "Spark Innovation Through Empathic Design," contend that innovation and ethnographic research are closely linked in the context of product design. Citing

numerous examples from manufacturing and design, Leonard and Rayport argue that empathic design (i.e., ethnographic research) helps design teams identify new product concepts based on user's unarticulated needs. These concepts often represent unimagined business opportunities for clients. A good example is a heads-up display system that a developer at Hewlett-Packard conceived while observing a surgeon. Although the surgeon never actually complained about anything specific, the developer noticed that the surgeon had significant problems watching his hands as they were displayed on a television screen across a crowded operating room. "This unacknowledged problem," Leonard and Rayport report, "caused the developer to ponder the possibility of creating a lightweight helmet that could suspend the images a few inches in front of a surgeon's eyes."[47]

As this example aptly illustrates, using ethnographic research to study real people in the context in which they work and live can be a powerful way to imagine innovative products. When applied properly, ethnography produces the unexpected results that business is increasingly demanding from industrial design. In short, ethnographic research is used because it works. As Leonard and Rayport note: ethnography ". . . is a relatively low-cost way to identify potentially critical customer needs. It's an important source of new product ideas, and it has the potential to redirect a company's technological capabilities toward entirely new businesses."[48]

Enhancing Creativity

A final conjecture as to why ethnography is so effective in product design is that it may actually enhance the quality of a designer's creativity. The reason for this is that ethnography is fundamentally an investigative and discovery-

oriented process. It is conducted as a means to search for the meaning that lies hidden in people's daily lives. The method includes the assumption that the truth is "out there," waiting to be discovered, identified and interpreted.

In creativity research, the link between discovery-oriented processes and enhanced creativity has been explored extensively. Perhaps the most significant conclusion from all this work has been the recognition that creativity begins with the discovery of an interesting, unique "problem." Paul Sourieu postulated back in 1881 that ". . . a question well posed is half-answered. There is something mechanical, so to speak, in the art of finding solutions. The truly original mind is that which discovers problems."[49]

Understanding the role and value of a problem continued into the early twentieth-century. John Dewey, for example, considered finding and identifying problems as essential to creative problem-solving. In his 1910 book *How We Think*, Dewey suggested that the creative process involves five discrete steps, the first two of which relate to perceiving and defining problems. A few years later, a British psychologist named Graham Wallas published *The Art of Thought.* In this influential book, Wallas developed a model of problem solving comprised of four distinct stages: preparation, incubation, illumination and verification. Interestingly, the preparation stage primarily involved investigating and identifying problems. Like Dewey, Wallas clearly understood creativity to be largely based on the discovery and definition of a problem.

Some of the most interesting contemporary research into creativity has focused on the relationship between how a problem is defined and the quality of a solution. Two of the pioneers in this area are Jacob Getzels and Mihaly Csikszentmihalyi, co-authors of *The Creative Vision: A Longitudinal Study of Problem Finding in Art*. In this seminal book, Getzels and Csikszentmihalyi present findings from their research into a central question relating to the creative process: "What is the relation between the artist's problem-finding behavior and the originality of the work he or she produces?."[50] To investigate this question, Getzels and Csikszentmihalyi methodically studied the behavior and artwork of students at the School of the Art Institute of Chicago over the course of

seven years. Their research included a wide variety of methods, including: ethnographic observation, controlled experiments, exercises, and mental, perceptual and personality tests. It culminated in the identification of new insights relating to the formulation of problems, the nature of creativity and the quality of solutions.

In regards to ethnography and product design, the most interesting insight Getzels and Csikszentmihalyi articulated was a distinction between what they called *presented problems* and *discovered problems*. They explained the distinction as follows:

"At one extreme there are "presented problem situations" where the problem has a known formulation . . . and a recognized solution; here a person need only follow established steps to meet the requirements of the situation. At the other extreme there are "discovered problem situations" where the problem does not yet have a known formulation . . . or a recognized solution; here the person must identify the problem itself. . ." 51

In his 1996 book *The Work of Creativity*, Csikszentmihalyi defines the difference more directly:

"*Problems are not all alike in the way they come to a person's attention. Most problems are already formulated; everybody knows what is to be done and only the solution is missing . . . These are "presented" problems. But there are also situations in which nobody has asked the question yet, nobody even knows there is a problem. In this case the creative person identifies both the problem and the solution. Here we have a "discovered" problem."* 52

As these quotes suggest, discovered problems tend to provide a greater opportunity for more creative responses. Getzels' and Csikszentmihalyi's research into the behavior and performance of art students confirmed this observation. They found that a significant qualitative difference separated those students who discovered a problem from those who merely solved a problem. They concluded that *problem finders* generate qualitatively superior results. In other words, the discovery-oriented behavior of problem finders increased the originality of their results. "The person who looks

at problematic situations with an open mind," Getzels and Csikszentmihalyi wrote, "ready to let the issues reveal themselves instead of forcing them into a preconceived mold, increases his or her chances of discovering original responses"[53]

The work of Getzels and Csikszentmihalyi explains why ethnographic research is so effective in industrial design. It is actually fairly simple: as a fundamentally investigative and discovery-oriented research method, ethnography compels designers to search for exactly what creativity researchers suggest will produce the most original results - namely, undiscovered, interesting, unique problems.

Conclusion

From the vantage point of today, the relationship between ethnography and industrial design seems obvious and natural. Design employs ethnography as a means to gain insight into the types of products and systems that people need and want in their daily lives. This fundamental recognition came easily to design pioneers like Henry Dreyfuss, Robert Probst and William Stumpf. Although their methods differed, each strongly advocated extensive field research as a basic part of industrial design. The legacy of Dreyfuss, Probst and Stumpf includes the idea that designing innovative and commercially successful products requires designers to study and understand people involved in daily life.

Though recognized in the 50s and 60s, the value of ethnographic field research was not embraced by business or industrial design until the past few years. This paper has argued that the sudden "re-emergence" of field research in the 1990s has come about primarily because of changing conditions and new pressures in business, manufacturing and design. Understanding user's needs, wants and expectations has, in fact, become a prerequisite to compete in today's highly competitive global marketplace. In short, methods like ethnography, which get designers and planners out of the studio and into the "messy" world of users and customers, are used because they help corporations and manufacturers compete more successfully.

The continued integration of ethnography into industrial design raises some significant implications for the profession and design

education. The most important of these is that practitioners and students will likely need to develop a basic "functional competency" in qualitative research methodologies. This will not be optional. For practitioners, the pressure will come from clients' need to compete successfully with products that genuinely support consumer's needs, wants and expectations. For students, the pressure will come from issues relating to employability. Those who are equipped during their undergraduate years with the knowledge and skills to conduct basic field research will likely enjoy greater employment opportunities and more promising career paths.

In any case, it seems highly probable that ethnography will become a permanent part of how industrial design is taught and practiced in the coming years. It has taken over a half a century, but Henry Dreyfuss' admonishment to study people and daily life prior to specifying solutions is finally, by all accounts, being heard.

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31. Stumpf, "Design Sleuthing: A Useful Research Approach," 7.

32. Stumpf, "Design Sleuthing: A Useful Research Approach," 4.

33. Stumpf, "Design Sleuthing: A Useful Research Approach," 3.

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