Letting Context Speak: The use of co-creative, design-led, and user-centered design methods in the design of complex public communications

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ABSTRACT
This paper discusses how co-creative, design-led, and user-centered design methods are being utilized to gain insight into the factors that influence the communication of food recalls. It looks at the role of designer and public in these methods and considers the value of these methods for other settings.

Categories and Subject Descriptors
H.0 Information Systems: General

General Terms
Design, Human Factors

Keywords
Food recalls, human-centered, user-centered, communication design, complex information, public communication, exploratory research.

> Design is a problem-oriented, interdisciplinary activity. There is a need to identify important problems and develop interdisciplinary strategies to deal with them. It is not sustainable to continue just reacting to clients' requests for design interventions. It is necessary to consider the discovery and definition of physical and cultural problems as an essential part of design. The nature of each problem might suggest the spectrum of disciplines required to confront it. A set of tools to look at the world will have to be developed by inquisitive, critical, interdisciplinary observation, performed by people in love with humanity.
>
> Jorge Frascara (2002)

In 1972, Victor Papanek published his provocative book *Design for the Real World*. In it, he called for designers to become advocates for society. To work for the good of mankind, not just respond to the frivolous desires of consumerism. In the last four decades, others have repeated Papanek's call for change to the way design engages culture. Victor and Sylvia Margolin have challenged designers to show how our field can contribute to human welfare (2002). And, as noted above, Jorge Frascara encourages designers to look beyond client-initiated projects. He suggests that it is our responsibility as designers to uncover communication problems that impact society.

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Unfortunately, problematic communications abound in our society. The 2000 U.S. Presidential ballot recount in Florida is a memorable example of poor design. This example gained enough press to put design on the national news. In addition, AIGA (the largest professional design organization in the US) responded to the election by initiating an ongoing ballot and election design project. This project has produced a series of field guides that provide best practices for election officials. The AIGA has also worked with the U.S. Election Assistance Commission and several states to develop national guidelines for ballot and polling place design (2014).

The recent controversy over the healthcare.gov website has also gained national attention to design issues such as usability and user experience. In a 2013 article in wired, Marcus Wohlsen summarizes the concern:

> Usability is perhaps the core value of good web design. And more than 15 years after the popularization of the web, it's not like we don't know what good user experience looks like. It's an entire job category. While complaints about Healthcare.gov have centered more on backend enterprise issues than front-end design issues, the distinction doesn't matter to users. It works or it doesn't. And if it doesn't, users shouldn't be subjected to what has amounted to a huge waste of their time.

In both of these cases, the response has been a reaction to public outcry. But for every election or healthcare website debacle there are dozens of everyday experiences that cost the public time, money, and health. How do we identify and respond to the quieter calls for improved public communication? And can we initiate this type of work before the public, industry, or government fund it? How do we do it in a way that involves the public, utilizes communication expertise, and persuades organizations, industries, or the government to support research?

FINDING A STARTING POINT: FOOD RECALL COMMUNICATIONS
Like election ballots and the healthcare.gov website, food recalls

have a large impact on our culture and face complex communication challenges. It is estimated that foodborne illnesses cost the US $152 billion annually (Scharff, 2010). According to the Centers for Disease Control and Prevention (CDC), 1 in 6 (48 million) Americans are affected with foodborne illness annually. Of those affected, 128,000 are hospitalized and 3,000 die.

The U.S. Department of Agriculture (USDA) and the U.S. Food and Drug Administration (FDA) oversee U.S. Food recalls. The two agencies primarily use press releases to the media, online postings, and email alerts to notify the public about food recalls (GAO, 2004); however, the public remains largely uninformed. The average American is aware of 2 to 5 recalls a year (Peake et al, 2013). In contrast, the fourth quarter of 2012 averaged six recalls per day (Gelski, 2013).

Calls for Change

Calls for change to the way food recalls are communicated have come from within the U.S. Government. In 2004, the U.S. Government Accountability Office (GAO) suggested that efforts to communicate food recalls to consumers were ineffective. Their report to congress led to the 2011 FDA Food Safety Modernization Act (FSMA). The FSMA has given greater authority to the FDA and is reforming how food is tracked, but it has done little to change the way food recalls are communicated to the public.

Several studies from public organizations have also called for change in the way food recalls are communicated. The Department of Health Policy and Management at Harvard (Steelfisher, et al., 2010) and the Food Policy Institute at Rutgers University (Hallman et al., 2009) called for new ways of communicating food recalls. Additionally, the Center for Science in the Public Interest and the Consumer Federation of America and others have suggested that food recall communications should be placed in retail stores (GAO, 2004; Waller & Searns, 2006).

The Need for Public Participation

The majority of existing studies or reports are based on the results of surveys or interviews. These methods give us a general understanding of what the public thinks but according to participatory or co-creative design researchers, they fail to reveal more latent beliefs that are critical when designing future products (Sanders, 1999). Visser, Sanders, Stappers, and Van Der Lugt suggest, “For learning about potential future experiences, we need to include peoples’ dreams and fears, their aspirations and ideas” (2005). In her earlier work, Sanders states, “The biggest opportunity for improving the quality of products that we design today is to practice collective creativity with ‘users’” (2001).

This need for greater public participation in the design process is illustrated by two surveys that seem to contradict each other. The first is a 2009 survey done by the Food Policy Institute at Rutgers University. Their research suggests the public would prefer to receive recall information, while they, “are thinking about food” (Hallman et al., 2009). Specifically, it suggests that 73% of the public prefer to receive recall information on their shopping receipt. However, a second survey conducted by researchers at the University of North Texas and Louisiana State University concluded that the public would prefer recall information in stores near where a recalled product was sold (69%). In this survey only 3% of the respondents selected the receipt as the preferred location for food recall notification (Carlson and Peake, 2013). By adding more options to the question, the second survey saw a dramatic change in response.

This apparent contradiction is a good example of the limitations of more traditional or qualitative inquiries into public preference. There are times when these approaches are rich and valuable; however, when imagining future products they fail to gain the deep insight that more participatory or co-creative methods might obtain (Sanders, 1999).

Contextual Factors for Food Recalls

Food recalls face complex logistic, technology, and human factors. Logistically, food recalls rely on retailer data records that are not standardized. The Rapid Recall Exchange (RRE) is a program of the GS1 US designed to streamline communications between suppliers and retailers. The program has over 1,000 members and represents over 85% of US grocery All Commodity Volume or annual sales volume (GS1, 2012). The RRE is a step toward more accurate recall information, and it is helping organizations meet requirements of the FDA Food Modernization Act, but it does not set a national standard for supply chain data across the industry. This may be why researchers such as Hallman and Cuite suggest that partnering with retailers may be the first step in changing food recalls (2009).

Technologically, food recalls face a changing scene. The growth of smart phone and tablet usage in the US has changed the way media is consumed. Facebook, Twitter, and other social networks did not exist fifteen years ago. Research has shown that social networks may be a valuable way to communicate food recalls, although consumer trust of social networks to communicate food recall information is currently quite low (Carlson & Peake, 2013). These factors are both a challenge and an opportunity for rethinking how food recalls might be communicated in the future and need to be integrated into research methods.

A diverse and changing culture is also a factor in communicating food recalls. The 2010 Census revealed that the number of people in the US that speak a language other than English at home has nearly tripled in the last thirty years (Barron, 2013; Ryan, 2013). Generationally there are also divides in use of technology. In January of 2014, Pew Research showed that 79% of 18-29 year olds owned a smart phone, while 45% of 50-64 year olds and 18% of adults 65 and up owned a smart phone. However, access to smart phone technology does not necessarily equate to being better informed about food recalls, as millennials (born between 1977 and 2002) are less aware of recalls than older generations (Peake et al., 2013). Previous research has also shown that the public is concerned about food safety, but few will take steps toward being better informed (Cuite et al., 2007). This public paralysis is evident in research from the Food Policy Institute which suggests that 40% of the public would be interested in receiving emailed food recall alerts but only 6% of the population actually utilize the existing service (Hallman, Cuite, & Hooker, 2009).

An Opportunity For Research

The complexity of food recall communications make it well suited to enact the kind of research encouraged by Frascara, Papanek, and Victor and Sylvia Margolin. It demands a multidisciplinary team

with a human-centered approach that can communicate outcomes clearly to potential public or private partners. It is an opportunity to work for the good of mankind and not just respond to the frivolous desires of consumerism.

DEVELOPING A PLAN: HUMAN-CENTERED DESIGN APPROACHES

Human-centered design is a broad term used here as a way of describing a variety of design methods that aim to incorporate end-users into the research process. Most human-centered design methods seek to reveal deeper understanding of end users.

Exploring the Terrain

Over the last decade, Elizabeth Sanders has been evolving a map of human-centered design methods with a variety of collaborators including, Peter Kwok Chan, Pieter Jan Stappers, and André Liem. Sanders' 2006 map established x-axis and y-axis labeling that has changed little in other map iterations. On these maps, the x-axis marks the mindset from which the method comes from. To the left of the axis is "expert mindset;" and to the right is "participatory mindset." In a 2011 article, Liem and Sanders discuss the difference between these two mind-sets at length and suggest that it is difficult for many researchers to transition from one to the other:

> There are two opposing mind-sets evident in the practice of design research today. The left side of the map describes a culture characterized by an expert mind-set. Design researchers here are involved with designing for people. These design researchers consider themselves to be the experts, and they see and refer to people as "subjects," "users," "consumers," etc. The right side of the map describes a culture characterized by a participatory mind-set. Design researchers on this side design with people. They see the people as the true experts in domains of experience such as living, learning, working, etc. Design researchers who have a participatory mind-set value people as co-creators in th e design process. It is difficult for many people to move from the left to the right side of the map (or vice versa), as this shift entails a significant cultural change.

The y-axis of the map contrasts two approaches to design research; "design-led" approaches are positioned at the top of the map and "research-led" approaches are placed at the bottom.

In their 2011 article, Liem and Sanders present an alternative version of the map that eliminates the tools and methods to reveal three distinct perspectives on design research: Co-creation in the upper right quadrant (participatory mindset x design-led); Design-led in the upper left (expert mindset x design-led); and User-centered in the lower right (expert mindset x research-led). These quadrants reflect differing origins, approaches, and mind-sets that inform the research methods positioned in each quadrant.

Co-Creation: Design-led with Participatory Mindset

Traditional methods of studying users such as interviews, observation, and focus groups provide limited information for the design of future products (Visser, et al., 2005). In contrast, Co-creative design methods have been utilized effectively in the development of new products (Visser, et al., 2005). Liz Sanders and Pieter Stappers define co-creation as, "any act of collective creativity, i.e., creativity that is shared by two or more people" (2008). They suggest that end users can become co-designers, offering expertise throughout the design process. This might be achieved through workshops or generative sessions that ask end-users to create using toolkits provided by designers and researchers. The goal of these sessions is to get users to "say, do, and make" (Sanders, 1999). Sanders suggests, "When all three perspectives (what people do, what they say, and what they make) are explored simultaneously, one can more readily understand and establish empathy with the people who use products and information systems" (1999). Co-

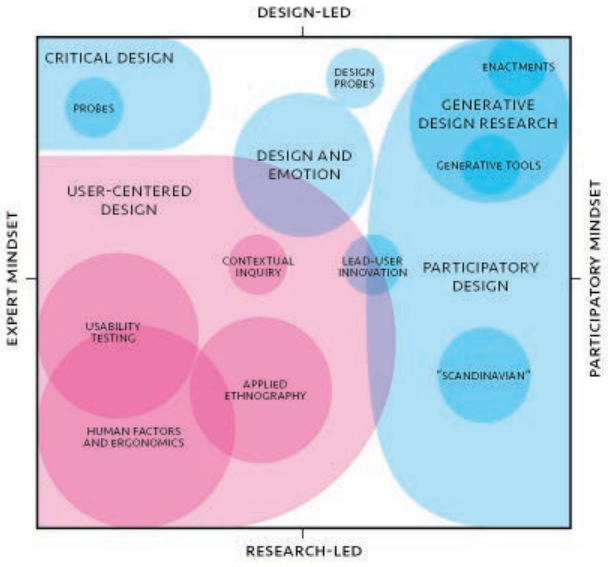

FIGURE 1: A MAP OF DESIGN RESEARCH AND PRACTICE
Elizabeth Sanders, 2008 (Updated 2011 with Andre´Liem)

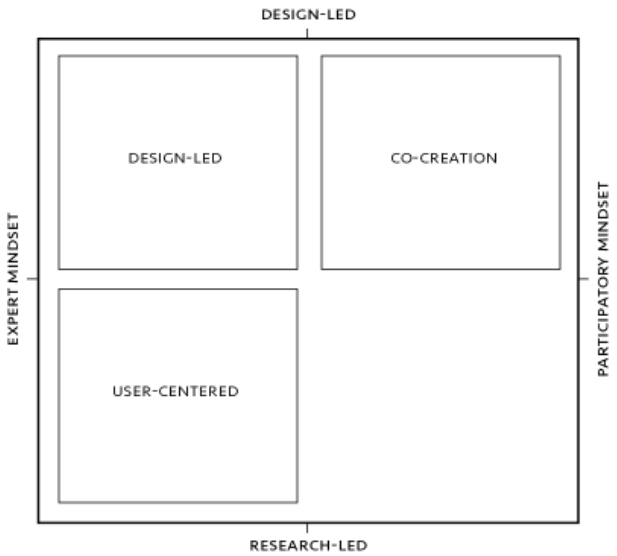

FIGURE 2: FRAMEWORK FOR POSITIONING THE THREE PERSPECTIVES ON NON-TECHNOLOGICALLY DRIVEN PRODUCT DEVELOPMENT PROCESSES
Andre´Liem and Elizabeth Sanders, 2011

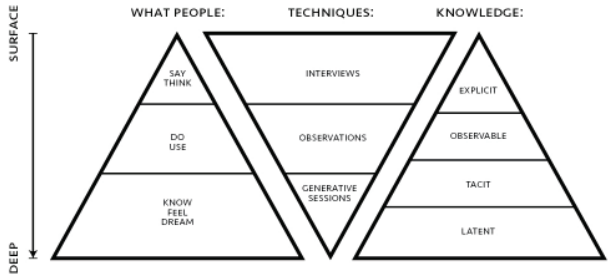

FIGURE 3: CONTEXTMAPPING: EXPERIENCES FROM PRACTICE
Froukje Sleeswijk Visser, Pieter Jan Stappers, Remko Van Der Lugt, and Elizabeth B.-N. Sanders

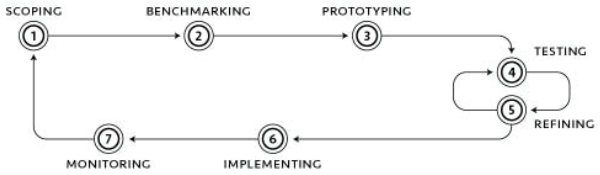

FIGURE 4: INFORMATION DESIGN PROCESS
David Sless, *Measuring Information Design*, Information Design Journal. 2008

creative methods such as generative design sessions attempt to gain insight into end-users feelings, dreams, and latent knowledge through participation in the creative process.

Sanders and Stappers suggest that co-creative approaches have more impact if they are implemented early in the design process: "In our experience as researchers and practitioners, we have seen that co-creation practiced at the early front end of the design development process can have an impact with positive, long-range consequences" (2008)

Co-creative methods may give designers and researchers deeper insight into end-user needs in the design of future products. Used at the front end of the design process, these methods may be able to help designers and researchers gain context, empathy, and understanding.

Design-Led: Design-led with Expert Mindset

To achieve performance standards, this process benchmarks the performance of existing communications and then refines prototypes through an iterative process of testing. Sless suggests that this process can improve the performance of public information and may aid in establishing standardized handling of public communications (2008). Sless also suggests:

> Testing, or more broadly the process of collecting evidence about the performance of a design with people, should occur at three points in the information design process: at the benchmarking stage to establish the current performance of a design, at the testing and refinement stages of a new prototype, and at the monitoring stage when the design is in use and its performance is being tracked to maintain its optimal performance (2008).

In usability testing the end user is no longer participating in the design or creation of the communication system, but is a research subject responding to or trying to operate a prototype or finished design. The results are more quantifiable and as Sless suggests, may help in standardizing communications.

Making Connections

The three quadrants of Liem and Sanders map come from distinct approaches and mindsets. Each offers distinct outcomes that appear to have value at different stages in the design process. Despite Liem and Sanders' suggestion that transitioning from one quadrant to another may be difficult for individuals, the authors believe there is a natural progression from one to another.

Co-creative methods offer designers and researchers the ability to gain deep understanding of end users and their context. Design-led methods such as critical design may give designers space to consider complex factors in a design intervention and then instigate end-users' continued participation in the design process. User-centered methods such as usability testing may provide designers and researchers with quantifiable performance data. Helping to guide the design process and clearly communicate potential outcomes to public or private entities.

Utilizing David Sless' research process and combining it with co-creative and design-led methods the authors propose a model for researching complex public communications. The model progresses from the "fuzzy" front-end of the research to the more concrete performance testing of a prototype. The progression allows for public input throughout the design process without hindering the expertise of researchers and designers.

INITIAL RESULTS

Scoping Phase

The scoping phase of this project included background research, two consumer surveys, and interviews with industry experts. The background research suggests that changes in the FDA, GS1, and food industry are positively impacting the quality of data available for tracking of food in recalls, however the greatest advances are within larger retailers and specific market segments such as fish. The surveys confirmed previous research suggesting the public would like food recall information in-store. They also suggested that the public would like recall information located near where the product was sold. Federal agencies were shown to be the most trusted source of recall information, while online social networks lack public trust.

Co-Creative Phase

Four co-creative workshops have been conducted thus far. Each workshop had between 7-13 participants. The workshops consisted of a pre- and post-test survey, a series of 3 reflective exercises that centered around two fictional recall scenarios, group brainstorming and discussion, and a rapid prototyping exercise that was done both individually and as small groups.

The workshops revealed a number of helpful insights into consumers beliefs about food recalls, including:

- Wording of in-store food recalls must be written carefully so as to not alarm shoppers

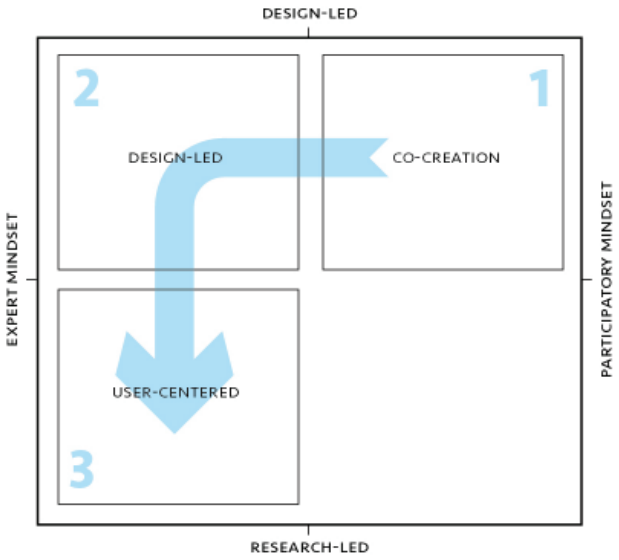

FIGURE 5: PROGRESSION THROUGH HUMAN-CENTERED DESIGN METHODS FOR COMPLEX PUBLIC COMMUNICATIONS
Based on Andre´Liem and Elizabeth Sanders, 2011

- If worded correctly (e.g. 'Did you know…' instead of 'Caution!'), most participants said that they would not be alarmed by food recall notifications in retail settings
- If worded correctly, retailer transparency about recalled products would be viewed positively by most participants
- Participants confirmed the survey preference for recall information near where a recall product had been sold
- Older participants envisioned more digital solutions when prototyping
- Younger (college-aged) participants envisioned more traditional print-based solutions when prototyping
- Color-coding of severity of recalls was a common consideration
- Most participants said that they would like to see 'alert' posts from news organizations on social media or push notifications on their phone
- The use of novel technology like touch-screens and product scanners were not common concepts, but were supported when introduced by participants

The workshops helped gain a deeper understanding of key issues that will be faced in redesigning food recall communications. There wasn't a clear cut consensus on a single prototype solution in the workshop. And participants sometimes had difficulty imagining solutions that were different from something they had seen before, even when prompted to create an absurd solution.

NEXT STEPS

The next phase of the research plan will be a series of critical design workshops that present participants with prototype designs that introduce novel ways of communicating food recalls in a retail setting. Several of the prototypes will be absurd solutions designed to provoke dialogue and reflection with participants. A reflective co-creative rapid prototyping exercise may be utilized after the critical artifacts are presented and discussed. This will give participants a chance to creatively respond to concepts and ideas that the workshop provoked in them.

CONCLUSIONS

Researching and designing for the needs of society when there isn't a public outcry for change can be isolating. Unknown roadblocks lurk around every turn in the research, and questions arise often. Human-centered design methods are essential to understanding the complex context in which food recall communications take place. The methods allow for dialogue between the public, researchers, designers, and potential partners. It is that dialogue that makes this project human-centered and it is that dialogue that gives the context a chance to speak.

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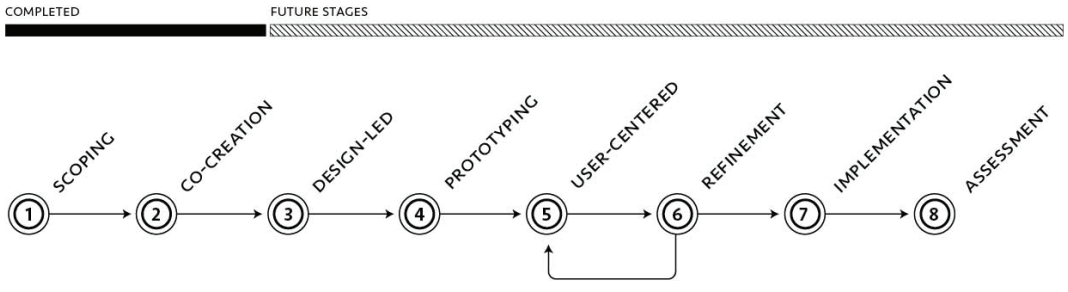

FIGURE 6: RESEARCH PLAN
Current project showing progression from explorative co-creative research to prototyping and user-centered testing of specific functions and features before implementation. Research stages and terminology influenced by David Sless (2008), André Liem and Elizabeth Sanders' (2011).

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