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MAGIC MOMENTS: WHEN CUSTOMER INSIGHTS EMERGE

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ABSTRACT

Successful new product development (NPD) is based on gaining deep customer insights from market research (survey and ethnographic data). Collaborative Design Workshops are used by practitioners as an approach to generate customer insights and new product ideas. However, a review of the literature indicates that how managers analyze survey and ethnographic data to gain insights is not well understood. Furthermore, independent of the market research method used, the way product development teams generate insights is under-researched. To redress this gap, extensive access was gained to a multinational manufacturer and an in-depth, multi-method case study was conducted of the way the company undertook market research (both survey-based and ethnography) and analyzed the results within a customer insights generation effort. From a theoretical perspective, developing customer insights has been recognized as a form of sensemaking. This theoretical perspective was thus adopted using Weick's (1995) sensemaking framework. The findings demonstrate the iterative and complex nature of the process of generating insights, through collaborative design workshop discussions which both referenced the market data collected and involved a small group of customers. The contribution of the article is twofold: firstly, it provides an in-depth understanding of one company's processes for leveraging market research data; secondly, it demonstrates where the concept of sensemaking can (and cannot) help to bring a better understanding of the process of generating customer insights.

INTRODUCTION

Successful new product development (NPD) requires deep *customer insights* (Griffin et al., 2009; Morris, 2006; Leonard and Rayport, 1997) and over 70% of CEOs want their organizations to be “more adept at converting data into insights and insights into action” (IBM, 2012). However, the process of generating such insights is perceived by practitioners as challenging (Business Week, 2006). Academics have also recognized the importance of insights (Griffin et al., 2009) and that it is an area where more research is needed (Marketing Science Institute, 2012). But NPD scholars have done little to develop the theoretical understanding of customer insights.

In a recent survey of US managers, ethnographic market research was rated as the most effective way to capture “voice of the customer” (VOC) insights during the front end of NPD (Cooper and Edgett, 2008) and many researchers have pointed to the utility of ethnography (e.g. Elliot and Jankel-Elliot, 2003; Arnould and Wallendorf, 1994; Rosenthal and Capper, 2006). Numerous studies have described how ethnography has been applied to NPD (e.g. Poolton and Ismail, 2000; Morris, 2006; Suri and Howard, 2006; Goffin et al., 2012) but these do not explain how insights were generated. Another way of developing insights during NPD is collaborative design workshops, where cross-functional team members from companies interact with customers (Plowman, Prendergast, Roberts, 2009). Such workshops are reported to be effective but, again, how insights

emerge is not clear because the nature of customer insights has not been sufficiently investigated.

The dictionary definition of insight is “perception and understanding of a thing’s nature” (OED) but there is confusion as to what a *customer insight* is. The widely read on-line *Marketing* magazine recently said that: “two words not commonly found in the same sentence [are]: ‘insight’ and ‘definition’ (Edwards, 2013: p1). In addition to the lack of a suitable definition for insights, further study is required to explore how insights are generated during the front-end (Creusen, 2011) and managers apply them in NPD (Khurana and Rosenthal, 1998).

To investigate how managers use market research data, case study methodology was chosen. Access was gained to the multinational company which develops and manufactures household cleaning products and owns a number of international brands. The level of access granted to the research team was unique in that both the data collection stages and the way managers interpreted this data in a collaborative design workshop could be studied. Thus the full dataset available to the research team consisted of a customer needs survey; ethnographic video data of visits to customers’ homes; an agency’s analysis of the ethnographic data; and seven hours of video of a collaborative design workshop in which managers and customers generated new product ideas. For each of the insights generated at the collaborative design workshop, how they emerged was identified by analysis and coding of the data.

From a theoretical perspective, the work of Weick (1995) on sensemaking was applied and this was found to provide a useful (albeit partial) understanding of the cognitive and team processes involved. Analysis showed that discussions iterated between customer needs and ideas in a progressive loop that led them to develop detailed product concepts. Thus, the ‘process’ of moving from market research data to product ideas was found to be dynamic, informal and highly flexible—a perfect example of why such early stage activities in NPD are referred to as the *fuzzy front-end* (Koen et al, 2001). Overall, the results provide new knowledge on the cognitive process by which insights are gained from customer data. The contribution of the research is it provides an in-depth understanding of one company’s processes for analyzing customer data and, secondly, it demonstrates where the concept of sensemaking can (and cannot) help to bring a better understanding the process of generating customer insights. The results also have important implications for how managers can become more effective at generating new product ideas.

The rest of this article is presented in five main sections. First, the relevant literature and the theoretical framework adopted are described. Next, the research questions are defined, the choice of case study methodology is explained and the way the extensive qualitative data were coded and analyzed is discussed. The third main section is the results and this is followed by the discussion and conclusions (with implications for both theory and practice being identified). Fifthly, a short summary of the research is given.

THEORETICAL FRAMEWORK

In developing the theoretical framework for this research, four areas of the literature were relevant:

- Articles from the innovation literature describing the way in which customer insights are generated from market research data.
- The psychology literature on creativity and sensemaking.
- Discussions of ethnographic market research, as a method for generating customer insights.
- Articles on design collaborative workshops, as an approach to generate customer insights.

The Nature of Customer Insights

The importance of customer insights has been recognized in the marketing, quality, NPD and industrial design literatures, each of which give slightly different perspectives (summarized in Table 1). However, there is a lot of confusion because the term has become an “off-used buzz-word” (Deloitte, 2014:www.deloitte.com/market-insights). The confusion is exacerbated as some of the literature does not clearly differentiate between the terms *customer insights* and *customer needs*, although it would appear that the analysis of market research data leads to insights, from which specific customer needs can be identified.

In the marketing literature, the term customer insights is extensively used to denote the outcomes of market research that show where value can be created for the customer (Schultz, 2013). An insight has been defined as “an experience in which product usage for the individual translates from a relatively unconnected set of steps into a meaningful sequence of actions” (Lakshmanan and Shanker 2011: p106). An insight is important because “customers are less interested in the technical features of a product or service than in what benefits they get from buying, using or consuming the product” (Hooley and Saunders, 1993: p17). Practitioners know that a superficial market analysis does not lead to novel product ideas because “better” customer insights are required (Nielsen Customer 360 Conference, UK 2004). Real insights emerge from deeper, hidden meanings and social values (Levin, 1992; Dahan and Hauser, 2000). Therefore, data must be organized into mental models to gain deep insights (Lakshmanan and Shanker 2011). NPD managers have to capture “customer insights that arise out of intuition... [and] having both deep understanding and a breadth of knowledge” (Griffin et al., 2009: p232). Once the range of needs have been identified, they need to be organized into a hierarchy and their relative importance to customers established (Griffin and Hauser, 1993).

The American Productivity and Quality Center (2001: p1) defined customer insights as: “understanding customers and markets”. Another relevant definition is, “descriptions, in the customers’ own words, of the benefit to be fulfilled by the product” (Griffin and Hauser, 1993: p4). The quality literature also stresses that customer needs should be categorized into “basic” or “must have” needs (which customers assume a product will do); “performance” or “more the better” needs (which customers explicitly state); and “excitement” needs (seldom articulated needs that, when satisfied, lead to delighted customers) (Kano et al., 1984).

NPD scholars have also identified the importance of customer insights (e.g. Cooper and Kleinschmidt, 1987; Hoban, 1998; Ernst, 2002; Jaruzelski, Dehoff, and Bordia, 2006), particularly for the development of breakthrough products (Dewar and Dutton, 1986). Surprisingly, however, the PDMA Glossary (2007) does not contain a definition of the term. In the NPD literature, customer insights are regarded as the way product concepts can be aligned with market requirements, through market research (see

Van Kleef et al., 2004). Insights are neither problems nor solutions, but verbal statements of the broader benefits customers gain from owning and using a product (Urban and Hauser, 1993) and need to be generated at the front-end of NPD (e.g. Cooper and Kleinschmidt, 1987; Cooper and Edgett 2008; Khurana and Rosenthal, 1998; Kim and Wilemon, 2002).

The literature of industrial design gives another important perspective. Ulrich and Eppinger (2000: 69) stated, “Customer needs... are the result of interpreting the need underlying the raw data collected from customers”. They recommend that market data should be analysed to: identify the range of customer needs; create a hierarchy of needs; and generate a product concept, which “is an approximate description of the technology, working principles, and form of the product” (ibid, p108). In making interpretations, it is important to avoid prior assumptions (Deasy, 2003) and it has been stressed that industrial designers have the skills to develop a deep understanding of customers’ needs and values (Verganti, 2008), through visual representations (e.g. Buxton, 2007; Koskinen et al, 2003).

Although the value of customer insights has been acknowledged in the different streams of literature, the process by which customer insights emerge, are understood, and are used by managers is under-researched. This is partly perhaps because research agencies are often employed to generate customer insights from VOC data. Company managers are usually not involved in generating and understanding insights. As a result, company managers often fail to use the insights generated by agencies to inform their decision making (Vriens and Vrehulst, 2008).

Table 1: Different Perspectives on the Nature of Customer Insights

	Stream of Literature			
	Marketing	Quality	NPD	Design
Main perspectives	-The outcome of market research	-The deployment of customer input throughout design manufacturing and service delivery	-The way to align the product concept with market requirements, through market research	-A deep analysis of user needs that informs product design
Representative quote	<i>“An experience in which product usage for the individual translates from a relatively unconnected set of steps into a meaningful sequence of actions”</i> Lakshmanan and Shanker 2011: p106	<i>“Descriptions, in the customers’ own words, of the benefit to be fulfilled by the product or service”</i> Griffin and Hauser, 1993: p4	<i>“customer insights... arise out of intuition... [and] having both deep understanding and a breadth of knowledge”</i> Griffin et al., 2009: p232	<i>“Customer needs... are the result of interpreting the need underlying the raw data collected from customers”</i> Ulrich & Eppinger, 2000: p69

Main references	Levin, 1992 Hooley & Saunders, 1993 Arnould & Wallendorf, 1994 Lakshmanan & Shanker, 2011	Kano et al., 1984 Griffin & Hauser, 1993 APQC, 2001	Cooper & Kleinschmidt, 1987 Urban & Hauser, 1993 Hoban, 1998 Morris, 2006 Dahan & Hauser, 2000 Griffin et al., 2009	Ulrich & Eppinger, 2000 Deasy, 2003 Koskinen et al., 2003 Buxton, 2007 Verganti, 2008
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A Theoretical Framework from Psychology

An insight, as the emergence of a solution to a difficult problem can be traced back to the Greek legend of Archimedes and his proclamation “Eureka!” The psychology literature includes extensive research on insights (e.g. Smith, Glenberg, Bjork, 1978; Wertheimer, 1945; Wallas, 1926). For examples, the process of gaining an insight and solving a problem was first studied by Wallas (1926). He identified four stages: first, a problem or issue is defined; secondly, data are collected; after a period of unconscious thought, insight (a solution) emerges; finally the insight needs to be verified.

Experimental studies on creativity and insight started with *gestalt* researchers such as Max Wertheimer (1945). According to the *gestalt* tradition, an insight is viewed as a conceptual reorganization, a sudden transformation of thought, or the result of understanding the inner nature of things. Sternberg and Davidson (1995) showed that most *gestalt* research involved experiments with college students in laboratory conditions and much of this work is not applicable to real world situations (Csikszentmihalyi and Sawyer, 1996), especially those involving groups (Simonton, 2003). Consequently, insights remain an ill-defined concept in group interactions: whether it is an unexpected solution to a problem, or a state of understanding is unresolved (Smith, Glenberg and Bjork, 1978).

More recent research has viewed insights as the result of the sensemaking (Weick, 1995) that occurs when individuals restructure their understanding (Klein and Jarosz, 2011). Brown et al. (2008: 1055) said: “To make sense is to organize, and sensemaking refers to processes of organizing using the technology of language—processes of labeling and categorizing for instance—and routinizing memories into plausible explanations”. Sensemaking takes place continuously within organizations (Mills et al., 2010) when individuals or groups “extract cues and they make plausible sense retrospectively while enacting more or less order into those circumstances” (Weick et al., 2005: 409). When individuals and groups (collective sensemaking) are involved in ambiguous situations (Gioia and Mehra, 1996), sensemaking based on discussion is central. In that way, commonly understood explanations are created, based on use of language (conversational practices). Sensemaking is about the search for meaning (cognitive practices), and plausibility. It is also about the investigation of how materials enable individuals and groups to make new understandings of their environment (material practices). The process of sensemaking consists of four phases (*ibid*):

- 1) *Noticing and Bracketing* (extracting cues from flow of experiences; sources of inspiration; labeling).
- 2) *Articulating* (framing; verbal articulation; making sense of the circumstance; linking material, cues and abstract categories).
- 3) *Elaborating* (storing, sharing and retrieving mental content; integrating and refining emerging mental structures; making provisional interpretations; visual integration);

4) *Influencing* (explaining, accounting for choices, communicating meaning, persuading about the goodness of an idea).

A review of the extant literature indicates that there is still limited “empirical evidence that draws upon the Weick’s framework as method of analysis” (Mills et al, 2010: p192). Rare exceptions include the investigation of conversational practices in health care (Parris and Vickers, 2005; Rovio-Johansson and Liff, 2012) and concept design (Stigliani and Ravasi, 2012). Researchers have acknowledged the importance of applying sensemaking theory to the early stages of NPD (Stigliani and Ravasi, 2012).

According to recent exploratory research, an insight can be viewed as a form of sensemaking that occurs when individuals in a group *reframe* their understanding (Klein and Jarosz, 2011). This criterion distinguishes between *shifts* in an individual’s understanding and *elaborations* of the way an individual understands a situation (ibid). This study looked at whether insights were sudden, based on making new connections (between data), or contradictions. Although, the empirical basis for this work was weak (a retrospective analysis of insights described in books), the authors present a coding scheme for understanding the nature of insights.

Gaining Insights from Ethnographic Market Research

Interviews and focus groups are the most frequently used methods to elicit customer needs in the USA (Cooper and Edgett 2008) and the Netherlands (Creusen, Hultink, and Eling, 2012). However, often customers cannot articulate their needs (Deszca, Munro, and Noori, 1999; Mariampolski 1999) and focus groups give incremental rather than breakthrough ideas (Sorensen 1999; Ulwick 2002). In contrast ethnography, has been acknowledged as an effective method (Cooper and Edgett, 2008; Elliott and Jankel-Elliott, 2003; Rosenthal and Capper, 2006), particularly when customer needs are not obvious, (Leonard Barton, Wilson, and Doyle, 1993).

Ethnography recognizes that humans are only consciously aware of a fraction of their perception and emphasizes an observer’s accounts of behavior can bring insights (Altheide and Johnson, 1994). Although, much attention has been paid to the techniques employed in ethnography (Becker and Geer, 1957; Goffman, 1959; Adler and Adler, 1994; Agar, 1996; Leonard and Rapport, 1997; Arnould and Price, 2006; Ishmael and Thomas, 2006), there is no single accepted approach. Rather ethnography is a set of techniques from which to select to match a project’s objectives, timing, budget, and target customers. A key technique is observing customers using products in their own environment (Arnould and Wallendorf, 1994), and supplementing this with questioning (Goffin et al., 2012). To gain an insight into customers’ unarticulated needs, the challenge is to identify feelings, experiences and beliefs (Altheide and Johnson, 1994). Such insights can “inspire and surprise” NPD teams (Arnould, Cayla, and Beers, 2014: 62).

The literature includes examples of successful products based on ethnography (e.g. Sanders, 2002; Rosenthal and Capper, 2006, Goffin et al., 2012) but relatively few companies have adopted the method (Cooper and Dreher, 2010). Furthermore, there is a lack of clarity about the process by which managers can gain insights from ethnographic data.

Gaining Insights from Collaborative Design Workshops

Collaborative design workshops have been widely discussed as methods that managers can use to evaluate VOC data and generate new product ideas (Khurana and Rosenthal, 1998). Innovation management researchers perceive CDW as an appropriate vehicle for transforming ethnographic data into new product ideas (Leonard and Rayport, 1997; Rosenthal and Capper, 2006). One method suggested is sorting customer needs into a hierarchy and the establishment of their relative importance by managers and customers (Griffin et al., 2009). Another popular method is to synthesize customer data into themes; and approach *affinity diagrams* in which each customer statement is grouped with other similar statements (Mizuno, 1988). Although this method provides an easy way to structure customer data, it is not a deep analysis (Smith, 1998). This is a serious limitation, customer insights should arise out of a depth of understanding, a breadth of knowledge and intuition (Griffin et al., 2009).

Sporadically, researchers have reported on discussions which led from VOC data to new product solutions (e.g. Plowman et al. 2009). However, these reports lack a theoretical underpinning.

Workshops enable different group members' perspectives to lead to new ideas (Harvey, 2014). Therefore organizations involve cross-functional members in collaborative workshops (Berger et al., 2005) but their influence on NPD is not well understood (De Luca and Atuahene-Gima, 2007). Co-creating with customers can be a useful approach for managers (Weber, Weggeman, Van Aken, 2012). Research has shown that many successful products have been inspired and even designed by customers (Von Hippel, Thomke, Sonnack, 1999). Despite the importance of CDW, empirical evidence and practical recommendations on how they lead to insights is lacking.

Conclusions on the literature

There are four main conclusions from the literature:

- Across different disciplines, customer insights are mainly viewed as emerging from a deep analysis of market research data.
- The creative process by which insights are generated has been studied in psychology; although the process by which insights are generated in real-life group situations is not well understood. The sensemaking theory is an appropriate theoretical perspective to bring to the topic of customer insights; the sensemaking researchers have pointed that efficiency of collective sensemaking during the front-end of NPD is a promising area for further empirical investigation.
- Ethnography is recognized as a key method for generating the insights that give a deep understanding of customer needs in the front-end but the process by which groups of managers move from raw market research data to customer insights and to new product ideas has not been adequately studied.
- Relevant literature on the topic of generating customer insights from collaborative design workshops is very limited.

RESEARCH AIMS & METHODOLOGY

Based on the gaps identified in the literature, the aim of this research was to study how managers generate customer insights. Aligned with this, the following research questions were selected:

- RQ1: *What type of insights emerge from traditional survey data, ethnographic data and collaborative design workshops?*
- RQ2: *How do customer insights emerge in co-creation workshops and how do they lead to new product ideas at the front-end of NPD?*
- RQ3: *Can the sensemaking theory be applied to explain how customer insights emerge into the front-end of NPD?*

To gain a deep understanding of how market research is used by managers, a case study methodology was selected (Silverman, 2003; Yin, 2003; Bonoma, 1985). Due to the amount of data to be collected and the challenge of gaining access, a single, exploratory case was selected.

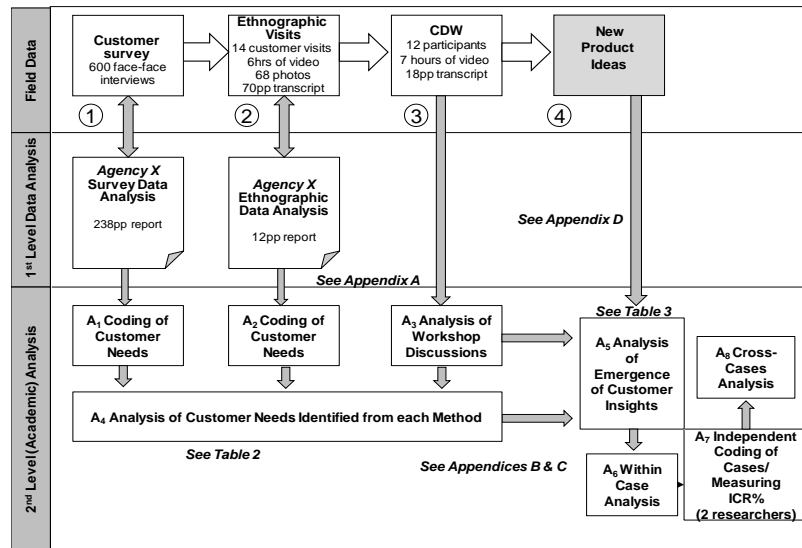
Case Selection

A purposive approach (Miles and Huberman, 1994) was used to select a suitable company. The first criterion was that the company should be making significant investments in NPD, so that it would have several projects in the front-end phase, so that a project could be studied as it was being conducted. The second criterion was that the company should have a strong focus on market research and the FMCG industry was selected (Fine, 2000). The third criterion was that the company had already worked with one of the research team's institutions, so that a level of trust already existed, which would lead to unlimited access.

A company that met all three criteria is in the top 100 of the Fortune 500 multinational corporations with headquarters in Europe. It will be referred to as *Corporation A* and it produces a wide range of products, including homecare, personal care, foods and beverages. The company has extensive in-house NPD activities and, despite the confidential nature of front-end activities, unrestricted access to data was given, once anonymity was promised. Data were gathered directly as they emerged. This was crucial since it is impossible to retrospectively collect data on front-end processes, as these activities are iterative, informal and not documented (Barzcak, Griffin and Kahn, 2003).

From the development portfolio of *Corporation A*, a project was selected where market research data were about to be collected—a project in the household cleaning division. *Corporation A* employed a market research agency, which will be referred to as *Agency X*, to help collect customer data. Full access was granted to attend visits and copies of reports and videos were made available to the research team.

Figure 1: Overview of Data Collection and Analysis Stages 1-9



Data Collection

Three sources of customer data were used: a survey conducted by *Agency X*; ethnographic research conducted by *Agency X* and *Company A* product managers, (shadowed by one of the research team); and a collaborative design workshop conducted by *Agency X* (observed by one of the research teams) (Table 2).

The Survey: Product managers from *Company A* worked with *Agency X* to design a survey instrument, which covered 22 topics, including brand awareness, usage, cleaning different rooms, cleaning WCs, and the attributes of different brands. It was administered by the agency via face-to-face interviews with 600 consumers. As shown in the middle ‘swimlane’ of Figure 1, *Agency X* analyzed the results and these were documented in 238 overhead slides, the summary of which was presented to the product managers. (The reason for the large number of slides was the multiple ways in which the data on brand awareness were presented.)

The Ethnography: The ethnographic market research lasted for three months and involved 14 home visits conducted by the agency with *Company A* product managers attending, shadowed by one member of the research team. Contextual interviewing combined with systematic observation of cleaning tasks being conducted were used to elicit issues, problems, as well as the emotions connected with cleaning. *Agency X* used a semi-structured interview guide to steer the discussion, as recommended in the literature (e.g. Goffin et al, 2012). Examples of questions asked were: “Why do you clean?”, “How do you feel about cleaning?”, “Which products do you use and why?”, “How do you use this product?”, “How can this activity become difficult or complicated?”, “How do you solve any encountered issues or problems?” In all of the visits, customers agreed to be videoed, or audio-recorded and photographed. As a result of studying real customers, the product managers involved in the study gained an understanding that they subsequently applied in the collaborative design workshop. *Agency X* was requested to summarize the results of the visits and this was done in the form of a 12 slide presentation.

The Collaborative Design Workshop: The analysis of the survey and ethnographic data was completed prior to the CDW. The CDW had 12 participants—a moderator (from *Agency X*), the cross-functional managers (8 members), 3 customers and 1 designer. The workshop lasted 7 hours, was videoed and observed by one of the research team, who kept field notes and gathered all the sketches and thumbnails produced. Although *Agency X* helped arrange and moderate the CDW, they did not provide a formal analysis of the results as they had for the two earlier stages. Instead the agency just passed a video of the workshop to *Company A* and a copy was made available to the academic research team. All of the discussions at the CDW were transcribed by the research team; resulting in 181 pages of transcriptions.

Data Analysis

There were two levels of data analysis. *Agency X* conducted the 1st level (see Figure 1) for Corporation A. The 2nd level of analysis (this academic study) required eight stages, labelled A₁ to A₈ in Figure 1.

Stage A₁: Coding of Survey

The results of the survey data analysis conducted by *Agency X* were coded and different customer needs identified. The frequency of mention of each customer need was recorded across the 238 pages report (Appendix A).

Stage A₂: Coding of Ethnography

The results of the ethnographic data analysis conducted by *Agency X* were coded and some new customer needs, not found in the survey data, were identified. The frequency of mention for each customer need in the 12 page report was recorded (Appendix A).

Stage A₃: Coding of the Collaborative Design Workshop

Firstly, the CDW data (7 hours of video recording and 181 pages of transcripts, and observer's notes) were coded openly to identify the stages of the workshop. Then, the data were coded to identify different types of customer needs. The frequency of mention of each customer need during the workshop discussions was recorded (Appendix A). The timings of mentions were also recorded for each customer need (Appendix D).

Stage A₄: Comparison of Customer Needs from Each Method

The different needs identified via the survey, the ethnographic visits and the collaborative design workshop were collated and the total number of mentions for each customer need was compared and contrasted (Appendix A). This allowed the customer needs that emerged from the workshop (i.e. the customer needs *not* identified before) to be identified (Table 2).

Stage A₅: Collating the Data on each New Customer Insight

The emergence of customer insights was the phenomena of interest in the research (and the unit of analysis). Drawn from a stream of the psychology literature (Klein and Jarosz, 2011) that views the insight as a new and different interpretation, the authors detected the emergence of what turned out to be eight *new customer insights*. For each of these the

relevant section from the 181 pages of transcripts of the CDW were identified and the videos reviewed. Each insight was linked to the transcription and video recordings.

Stage A₆: Within-Case Analysis

Each insight (case) was analyzed (essentially a within-case analysis) to identify how the each new customer insight had emerged. This stage looked at the insight process and whether collective sensemaking impacted the process. In a preliminary stage, sensemaking coding was used for each of the eight new product ideas, searching for relevant text segments—phrases and passages that referred to how product managers mutually interpreted customer needs, and how their collective interpretations reframed their understanding and led them to a new customer insight and a new product idea. These segments were labeled based on definitions for sensemaking drawn from previous sensemaking research (Gioia and Mehra, 1996; Stigliani and Ravazzi, 2012). The coding was done by checking each case for evidence of four variables: a) *Noticing and Bracketing*, b) *Articulating*, c) *Elaborating*, d) *Influence*. Thereafter, in order to add clarity on what customer needs the workshop participants *noticed/bracketed*, *articulated*, *elaborated and or influenced* each sensemaking variable was checked for evidence of customer needs. The coding scheme was augmented with ideas from ethnographic research (Goffin et al., 2012) and included seven variables: a) *Uses*, b) *Misuses*, c) *Workarounds*, d), *Problems*, e) *Processes*, f) *Acquisitions*, g) *Triggers*.

Stage A₇: Achieving Reliability

The initial discussion of the collaborative design workshop participants was used as a pilot to apply coding by two of the researchers. Following the pilot coding process a thorough discussion between the two researchers revealed the challenges of applying the sensemaking coding: capturing incidents of reframing of understanding and improvisation of new solutions by the workshop participants were not possible by the available coding scheme. To solve this issue, additions to the sensemaking coding were made drawn from recent psychology research (Klein and Jarosz, 2011) that highlighted the distinction between *shifts* in an individual's understanding (reframing of understanding-providing solutions) and *elaborations* of the way an individual understands a situation. Furthermore, additions were made to the systematic observation coding to capture future oriented customer needs namely *new benefits and features*. Thereafter, one case (Micro Grains Scrub) was subjected to *coding*, by two of the authors, working in parallel. Next, a comparison was made, and intercoder reliability (ICR) was calculated (Appendix C). It was obvious that the sensemaking operationalisations were relatively difficult to apply and modifications were made to improve ambiguity. Another case was selected (Cleaning Carpets product) with which the researchers again worked independently. A satisfactory ICR (of up to 100% for some codes) was achieved, indicating a strong level of agreement (see Appendix C). After the pilot coding and the first two within-case analyses, the definitions of the variables stabilized, and reliability checks were not necessary for the remaining six cases.

Stage A₈: Cross-Case Analysis

The coding scheme of each case (insight) was compared and contrasted. Following multiple re-readings, discrepancies were resolved through discussion and occasional

recoding of data. The final definitions were given in Appendix B. The three researchers worked in parallel, in a triangulation of analytical perspectives, to enhance the accuracy and robustness of the findings and to remove ambiguity.

RESULTS – CUSTOMER NEEDS IDENTIFIED

The three sources of data were all carefully coded to identify customer needs and the full results are shown in Table 2. This table indicates (4th to 6th columns) whether the need was identified in the survey, ethnographic report, or CDW data. For example, it can be seen that the customer need ‘Trustworthiness’ was found in all three sources.

Stage A₁ of the analysis focused on the survey results and from the 238 slide document 4 needs (‘trustworthiness’ of cleaning products, ‘cleaning power’, etc.), were found. It should be noted that most of the slide report on the survey was about brand awareness and not customer needs. Stage A₂ of the analysis looked at the report on the ethnographic visits prepared by *Agency X*. (This report was disseminated to *Company A* managers prior to the workshop.) The key findings from the ethnographic data revealed 19 needs that are shown in the 5th column of Table 2—only five needs were new compared to the survey (perhaps indicating that the agency’s analysis was not that good). Finally, the Stage A₃ analysis of the collaborative design workshop showed that it had four main Stages (3a to 3d) which are described in Appendix E. The key findings from the collaborative design data revealed 27 needs that are shown in the 6th column of Table 2. Across the survey, ethnographic market research and the workshop, 28 needs in total were identified. From these, eight were identified as emerging directly from the CDW discussions (these are Numbers 20 to 27 in Table 2).

	Customer Needs	Code	Survey Results: Customer Needs	Ethnographic Report: Customer Needs	Workshop Output: Customer Needs	Workshop Output: Customer Insights	Comments and Key Supporting Quotes from the Workshop
1.	Trustworthiness	TRUST	●	●	●	-	<i>"I apply hypochlorite everywhere and I only trust hypochlorite"</i>
2.	Cleaning power	CLEANING; CLEAN; CLEANLINESS	●	●	●	-	<i>"This product... you see on the spot the cleanliness and the clearness"</i>
3.	Disinfectant power	DISINFECTING; DISINFECT; DISINFECTION	●	●	●	-	<i>"It cleans and disinfects. When we talk about disinfection, it is utterly important".</i>
4.	Stain removal power	STAIN-REMOVAL	●	●	●	-	<i>"Lingering hard stains, especially in the bathroom or the verandas are the housewife's worst enemies! Old stains, difficult, impossible to deal with stains, accumulated dirt are difficult to get rid of"</i>
5.	Unpleasant smells removal power	SMELL-REMOVAL	●	●	●	-	<i>"The need is to absorb the smells inside the kitchen"</i>
6.	Germs elimination	GERM-ELIM	●	●	●	-	<i>"My sister, who is microbiologist doesn't use anything else in her lab apart of hypochlorite"</i>
7.	Versatility in use	MANY-MULTIPLE USES	●	●	●	-	<i>"Everybody, pretty much, uses hypochlorite for multiple uses".</i>
8.	Without side-effects	NOT CORROSIVE; DESTROY SURFACE-SAFE	●	●	●	-	<i>"I'm a bit scared about more sensitive surfaces"</i>
9.	No skin irritation	SKIN-SAFE	●	●	●	-	<i>"This particular hypochlorite product is not seen as ideal to come in contact with the skin"</i>
10.	No color fading	DISCOLORATION - SAFE	●	●	●	-	<i>"The problem with hypochlorite is that if it drops somewhere, it discolours"</i>
11.	Pleasant aroma	AROMA	●	●	●	-	<i>"We want pleasant aroma from hypochlorite"</i>
12.	Hygiene	HYGIENE	●	●	●	-	<i>"So, after that we've got doorknobs soaked in hypochlorite. We ensure... we ensure hygiene everywhere".</i>
13.	Ease of use	EASE-OF-USE	●	●	●	-	
14.	Sense of freshness	FRESHNESS	●	●	●	-	<i>"When you go to the bathroom, there will be a different liquid for freshness"</i>
15.	Whiteness	WHITENING	●	●	●	-	<i>"Hypochlorite...will be be whitening"</i>
16.	No respiratory problems	BREATHING (PROBLEMS)-SAFE	●	●	●	-	<i>"You breathe in and it causes you breathing problems".</i>
17.	Effectiveness reassurance	EFFECTIVENESS	●	●	●	-	<i>"To conclude, effectiveness means hygiene; in the sense that hypochlorite kills the germs"</i>

18.	Protection	PROTECTION		●	●	-	<i>"A product that will be cleaning and protecting the bathtub's and toilet bowl's enamel".</i>
19.	Fertilizer/pesticide for plants	PLANTS-FOCUS		●	●	-	<i>"We saw people using diluted hypochlorite to spray plants"</i>
20.	Guaranteed results - Proof it works	GUARANTEED; PROOF			●	Insight 1: I need to be certain, I want proof of the disinfecting effect on certain surfaces that have many and dangerous germs and bacteria.	<i>"When dirt is really bad you are not certain that you have cleaned and disinfected well...We want a product to inform us whether the area was indeed infected by germs".</i>
21.	Mould removal power	MOULD			●	Insight 2: Mould is the enemy of the housewife in the toilet. Many stains such as mould, lime scale and dust are real issues.	<i>"By saying "mould" we should imagine something... -That becomes black. There is inside the closets as well"</i>
22.	Use of hypochlorite to protect skin against germs	SKIN-FOCUS			●	Insight 3: I am afraid of the allergies and the problems that germs may cause to my skin	<i>"One uses gloves with softening elements for hands"</i>
23.	Germ free kitchen sponge	SPONGE-DISINFECTION			●	Insight 4: Cleaning sponges become very dirty with use and they are source of germs <i>"they end up being germ collectors!"</i> I would like my cleaning utensils to engage in active cleaning.	<i>"Soaked sponge get fungi... Can we get a soaked sponge without fungi?"</i>
24.	Clean and allergen-free carpet	CARPET-FOCUS			●	Insight 5: Carpets are germ and bacteria collectors and there is a need for a product to clean carpets deeply and safely, respecting them and keeping them in a good condition at the same time.	<i>"The worst bacteria accumulate in the carpet"</i>
25.	Disinfection of cutlery	CUTLERY-FOCUS			●	Insight 6: None of the existing products for cleaning cutlery has sufficient disinfecting qualities. I would need a stronger product, more effective on difficult stains and lingering smells.	<i>'So, as we care for disinfection from top to bottom, for the bottom we've got a kitchen mat, soaked in hypochlorite, so when the fork falls down by the little child, we can be sure that it's safe enough to reuse it afterwards".</i>
26.	Brightness	SHINE			●	Was mentioned but not discussed	<i>"There is no case not to see shine from the moment you use hypochlorite".</i>
27.	Gentle cleaning of clothes	CLOTHES-SAFE			●	Insight 7: I need for new scent and respect for skin and clothes	<i>"A new hypochlorite product to respect the fabric of clothes".</i>

28.	Germ free garbage bin/bags	GARBAGE-FOCUS			●	Insight 8: Garbage bins and garbage bags are a source of germs. I am afraid that wherever I place them, the area will be infected with germs. I would also like the bags to emit a nice smell.	<i>“They are very important for the germs”; “I am afraid that wherever I place them the area will be infected with germs. Also I would like the bags to emit a nice smell”.</i>
	Total		14	19	27	8 New Customer Insights	

Table 2: Comparison of Customer Needs Identified from the Survey, Ethnographic Visits, and Collaborative Design Workshop.

	Customer Insight (from Table 2)	Idea	New Product Idea/Features
1.	I need to be certain, I want proof of the disinfecting effect on certain surfaces that have many and dangerous germs and bacteria.	Color-changing formula	The new hypochlorite not only has a disinfecting effect, but also offers visual proof of its effectiveness. The color changes where the product comes in contact with germs. It has a sensing system to let us know where the germs are and gets to them. Guaranteed results.
2.	Mould is the enemy of the housewife in the toilette. Many stains such as mould, lime scale and dust is a real issue.	Micro grains scrub	With micro grains, this new product enables deepest cleaning effect without harming the surfaces
3.	I am afraid of the allergies and the problems that germs may cause to my skin.	Skin products related to feet, head lice, hand wipes	The new Health line looked into the skin needs for disinfection. The suggested range: antibacterial foot wash, antibacterial foot cream, antibacterial foot spray, antibacterial hand wash, and wet wipes for skin disinfection
4.	Cleaning sponges become very dirty with use and a kitchen sponge is a source of germs “they end up being germ collectors!” I would like my cleaning utensils to engage in active cleaning.	Special self-disinfecting cleaning sponge	A sponge that makes life easier and offers peace of mind. “You no longer need to worry about germs on the sponge. It has a special texture that keeps germs away and comes with a base to put it in that will infuse it with more product: “a two-in-one sponge with a disinfecting base”.
5.	Strong cleaning products cause carpet colors to fade. But carpets are germ and bacteria collectors and there is a need for a product to clean carpets deeply and safely, respecting them and keeping them in a good condition at the same time.	Product for Cleaning Carpets	Kills bacteria that abound in carpets and combats the causes of allergies.
6.	None of the existing products in this category has sufficient disinfecting qualities. I would need a stronger product, more effective on difficult stains and lingering smells.	Dishwashing liquid	“Not only does it get rid of difficult stains easily, but it also removes smells and offers disinfection, while respecting the skin”.
7.	I need a new scent and respect for skin and clothes.	New, less strong, gentle, sensitive hypochlorite product	8.New, gentle scent and lower intensity. It disinfects but it is gentle with surfaces and skin, “respecting the skin and the surfaces and leaving behind a pleasant smell”.
8.	Garbage bins and garbage bags are a source of germs. I am afraid that wherever I place them, the area will be infected with germs. I would also like the bags to emit a nice smell.	Hypochlorite-infused garbage bags	These new garbage bags are not only super resilient but they are also infused with hypochlorite both inside and outside. “Maintains the garbage bin clean and disinfected, preventing bacteria spread”.

Table 3. New Customer Insights and New Product Ideas generated in the CDW

RESULTS – THE EMERGENCE OF CUSTOMER INSIGHTS

The eight customer insights identified in the CDW were discussed by the participants leading to new product ideas and features (Table 3). During the course of the analysis it became evident to the researchers that the generation of deep customer insights is neither a linear nor a simple process. However, the CDW videos and transcripts allowed the emergence of each customer insight to be studied. To illustrate the sensemaking process, insight Number 1 (the colour-changing formula) will be described.

Example Insight Number 1: Colour-changing formula

Sensemaking Stage 1: Articulating Uses and Problems. Early in the CDW, the participants articulated the different uses and benefits of the existing product, emanating from its special features: *“it is the only product that has such a strong disinfecting power”* (Customer Penny, CDW DVD 1-minute 17:10); *“... and it acts quickly”* (Assistant, DVD 1-minute 17:45); *“our product is synonymous with cleanliness, disinfection and effectiveness”* (Product Manager, DVD 1-minute 14:32). They also dealt with the issues encountered in using the existing product (problems), such as: *“it may cause breathing problems”* (Finance Manager, DVD 1, minute 18:12).

Interestingly, the participants interestingly went back to the articulating of uses and problems of the existing product much later on, when they had already formulated the new product ideas. Occasionally, the participants asked clarifications from each other regarding the use of the new product and the process by which the new product was intended to be used: *“you mean to say that you apply it, you see the germs, you flush... do you have to apply it again so as to see if it changes color again?”* (Product Manager, DVD 5- minute 16:30).

Sensemaking Stage 2: Noticing and Bracketing Triggers, Uses, Acquisitions. With the guidance of the moderator, the participants began to extract cues from their own experiences. Company A product managers used the ethnographic visits as sources of inspiration, and the customers personal experience: *“from the research that took place and from my experience, I believe that it is the only one which disinfects killing all germs, used in hospitals, in supermarkets where meat and chicken is being handled, for germs, for salmonella, for all pathogenic germs etc.”* (Customer Penny, DVD 1- minute 15:37).

Sensemaking New Stage: Discovering Customer Insight. The discussions continued around three customer needs: a) the centrality of disinfection and the dangers from germs; b) the emotive importance of cleanliness; and c) the need for certainty in the results. These three initially disconnected customer needs led to a group reframing their understanding, which resulted in *“a customer insight”*. This new insight was associated with *“a product trigger”* (reason for using the product at a particular time): *“quick result”*; a *“process”* (the process by which the product is used) *“you see it quickly at that moment, you just see the cleanliness and the clearness”*; and with a ‘problem encountered’ (issues encountered in using the product) *“but it needs a certain time to be drastic against germs, a specific time to pass”* (CDW 1- minute 17:52) .

Sensemaking New Stage: Discovering New Product Benefits/Features. The new understanding led the participants to realize that what would help customers be certain about the power of their product would be to introduce a new feature for the customers to be able to witness the disinfection results, which would bring instant gratification and certainty in the effectiveness of the product (*“a formula that enables the product to change color”*) and an interesting discussion followed as to how this would be done: *“we want a colored product so*

as to be able to see where we applied it” (Finance Manager, DVD 1-minute 23:02); “that changes color when it comes in contact with surfaces” Marketing Communications Associate Director, DVD 1-minute 23:10).

Sensemaking Stage 3: Elaborating New Product Benefits/Features. The initial product solutions that were inspired by the customer insight led to further brainstorming of more refined new product and benefits and features when participants were split into groups to discuss further the benefits and features of the changing colour feature: “... *A new product that changes color when in contact with germs, to let us know if the area was indeed infected by germs*”; (Finance Manager DVD 2-minute 32:45). “*if it becomes pink from blue, it means that it has completed the cleaning process*”; “*and that bacteria have been killed*”(Customer Stella DVD 2-minute 32:48). “*Even better, a product that would change color when it has killed all pathogens so that we will be able to know that it performed the intended task, acting as a guarantee*” (Marketing Communications Director DVD 2-minute 33:46).

Much later on, the participants went back to the elaboration stage, during the last stage of the workshop. With the help of the moderator they built on each others’ ideas “*I want proof when I clean surfaces full of germs and fungi*” (Manufacturing & Technical Manager, DVD 5-minute 14:19).

Sensemaking Stage 4: Influencing on Uses and New Benefits/Features: During the course of the discussion, there was a need to allow or disallow certain actions. For example, the R&D Manager disallowed the use of certain terms by the participants, as their use could distort the meaning of the customer insight: “*do not say both germs and fungi because fungi is a germ*” (DVD 5-minute 13:30). In another instance, the Manufacturing Manager allowed the continuation of the discussion on the colour changing formula, confirming that the organization had the know-how to create such a formula. The new product idea was formulated as a new product equipped with a sensing system that offers visual proof of its effectiveness. The R&D Manager influenced further the participants by communicating additional technical information regarding the new features of the product: “*This is not a product, it is a substance which is also used in microbiological labs*” (DVD 5-minute 18:25).

Sensemaking New stage: Discovery of Customer Insight & New Product Benefits/Features. The resulting customer insight (DVD 5-minute 14:18) from this sensemaking process was in the end that “*I need to be certain, I want proof of the disinfecting effect on certain surfaces that have many and dangerous germs and bacteria*” (Written on the flip-chart). This process was conceptualized as *discovery stage* of customer insight and a new product idea, whereby an idea is based upon the discovery of a new customer insight and goes through a number of iterations and elaboration: “The new bleach not only has a disinfecting effect, but also offers visual proof of its effectiveness. The color changes where the product comes in contact with germs. It has a sensing system to let us know where the germs are and gets to them. Guaranteed results” (Written on the flip-chart). “*The new bleach does not only disinfect and clean; it cleans, disinfects but proves its supremacy. Just apply it and you will see the liquid changing colour where there are germs. The cleaning process is then complete*” (Assistant DVD 5-minute 21:00).

RESULTS – MAKING SENSE OF CUSTOMER INSIGHTS

All eight insights were subjected to a coding process to identify how they emerged and how they led to product ideas. For all of the insights the same systematic process was used (leading to similar descriptions that given above for the color-changing example). The cross

case analysis of the data confirmed the existence of three out of the four sensemaking stages in all cases: Noticing&Bracketing, Articulating and Elaborating. The fourth sensemaking stage, Influencing, was only found in five cases. Influencing appeared in those cases where there was more of a debate on certain features or ideas compared to others. The more radical the idea, the more debate among participants and thus the stronger the frequency of the influencing stage. Where there was less elaborating, there was less influencing. It was seen that less interesting ideas generated less discussion and elaboration. Another interesting finding was that the progression across the sensemaking stages was not linear. Instead there was repetition and reiteration. Stages did not necessarily appear in a set order and some stages emerged more frequently than others (Table 4).

Idea	Insight	Key Quotes Of Discovery Stage	Frequency of key codes	Key Conclusions
1.Color-changing formula	I need to be certain, I want proof of the disinfecting effect on certain surfaces that have many and dangerous germs and bacteria.	<i>“Well, in fact we perceive it as acting quickly, but in fact it needs a certain amount of time to pass to be drastic against germs. That does not mean it will not work in the end, it just takes time”</i> ; <i>“The new bleach does not only disinfect and clean; it cleans, disinfects but proves its supremacy. Just apply it and you will see the liquid changing color where there are germs. So then complete the cleanup</i>	-Noticing & Bracketing N= 5 -Articulating N=2 -Elaborating N=17 - Influencing N= 5 -Discovering N=10 Customer Insight: Uses/Problem/Trigger New Benefits/ Features N= 22	Frequent elaborating (N=17) led to frequent discovering (N=10). Customer insight linked simultaneously product uses; a problem faced during use and a reason for using the product. Numerous new benefits/features generated (N=22) triggered by discoveries.
2.Micro grains scrub	Mould is the enemy of the housewife in the toilette. Many stains such as mould, lime scale and dust is a real issue.	<i>“We want to tackle the limescale ... we want little crystals to do some kind of exfoliation ... peeling”</i> ; <i>‘peeling without rubbing’</i> ; <i>“bathroom cosmetics”</i> ; <i>“it needs to be enamel friendly”</i> ; <i>“without scratching or destroying”</i> .	-Noticing & Bracketing N= 8 -Articulating N=3 -Elaborating N=3 - Influencing N= 0 - Discovering N=6 Customer Insight: Process/Uses New Benefits/ Features N= 3	All participants appeared to be on the same page on this idea. Frequent noticing & bracketing, elaborating, articulating and discovering balanced, but no influencing.
3.Skin products related to feet, head lice, hand wipes	I am afraid of the allergies and the problems that germs may cause to my skin.	<i>“you pour a drop of bleach in a tub with water, you immerse your feet into the water and athlete’s foot is gone”</i> ; <i>“Healthy Skin”</i> .	-Noticing & Bracketing N= 9 -Articulating N=3 -Elaborating N=6 - Influencing N=0 - Discovering N=4 Customer Insight: Process/Uses New Benefits/ Features N= 9	Frequent noticing and bracketing. No influencing Numerous benefits/features (N=9) perhaps because the idea refers to a range of products.
4.Special self-disinfecting cleaning sponge	Cleaning sponges become very dirty with use and a kitchen sponge is a source of germs “they end up being germ collectors!” I would like my cleaning utensils to engage in active cleaning.	<i>“2 in 1 sponge with disinfecting base”</i> ; <i>“To have a base”</i> ; <i>“..with liquid inside..in gel form”</i> ; <i>“in order for us not to have liquids that move here and there and make it difficult”</i> ; <i>“..concentrated”</i> <i>“steady bleach gel”</i>	-Noticing & Bracketing N=8 -Articulating N=2 -Elaborating N=6 - Influencing N= 6 - Discovering N=8 Customer Insight: Process/Uses New Benefits/ Features N= 2	Frequent noticing & bracketing (N=8) and elaborating (N=6) led to rich discovering (N=8)
5.Product for Cleaning Carpets	Strong cleaning products cause carpet colors to	<i>“A new product which cleans the carpets without destroying them, but at the</i>	-Noticing & Bracketing N= 7 -Articulating N=2	No influencing, frequency of noticing & bracketing (N=8). Other than that, elaborating,

	fade. But carpets are germ and bacteria collectors and there is a need for a product to clean carpets deeply and safely, respecting them and keeping them in a good condition at the same time.	<i>same time has the ability to kill germs”; “trust it on a Persian carpet”; “it should not be in a liquid form, more like a tool ... a cloth”; “with the ability to brighten the carpet colors”.</i>	-Elaborating N=4 - Influencing N=0 - Discovering N=6 Customer Insight:Problem/Uses New Benefits/ Features N= 4	articulating and discovering are rather balanced.
6.Dishwashing liquid	None of the existing products in this category has sufficient disinfecting qualities. I would need a stronger product, more effective on difficult stains and lingering smells.	<i>“I’m sure about the dishwashing liquid, Because I attended the research and I think they really want it.”; “Look, it’s about these which stick from the teas, the coffees... ”; “I mean if you have fish, you are definitely going to apply hypochlorite so as both the sink and the plates to be without smells”</i>	-Noticing & Bracketing N= 5 -Articulating N=7 -Elaborating N=6 - Influencing N= 2 - Discovering N=7 Customer Insight:Problem/Uses/Triggers New Benefits/ Features N= 5	Balanced noticing& bracketing with articulating and elaborating. These sensemaking stages reiterated with frequent discovering. Customer insight linked uses to problems when using the product and to reasons for using the product.
7.New, less strong, gentle, sensitive hypochlorite product	I need a new scent and respect for skin and clothes.	<i>“You spray it, the whole toilet bowl foams, it goes up, let’s say, till... it covers the most of it and this acts slowly, it wonderfully perfumes, you close the lid and leave it. Not many times, that’s the point, it doesn’t need many times. So we need it.”</i>	-Noticing & Bracketing N= 9 -Articulating N=3 -Elaborating N=9 - Influencing N=3 - Discovering N=5 Customer Insight:New Benefits/Uses/Process New Benefits/ Features N= 8	Same frequency of noticing & bracketing and of elaborating reiterated with frequent discovering. Customer insight linked simultaneously new benefits; uses and process by which the product was used Many new product benefits/features were provided as solutions to the customer insight.
8.Hypochlorite-infused garbage bags	Garbage bins and garbage bags are a source of germs. I am afraid that wherever I place them, the area will be infected with germs. I would also like the bags to emit a nice smell.	<i>“Its distinctive smell acts as a certification of hygiene” Garbage bags spread germs wherever I place” We want them reinforced with double layer and super tough”</i>	-Noticing & Bracketing N= 5 -Articulating N=2 -Elaborating N=10 - Influencing N= 6 -Discovering N=7 Insight:Uses/Problem/Trigger New Benefits/ Features N= 5	Frequent elaboration (N=10) leads to frequent discovery (N=7). Customer insight linked simultaneously product uses; a problem faced during use and a reason for using the product. New benefits and features (N=5) were generated as solutions to the customer insight.

Table 4. Results drawn from the Cross-Cases Analysis

The first part of the collaborative design workshop, the initial discussion stage, was a very important one. It acted as the foundation stone for the emergence of the insights, as it led to a very important initial unmet needs identification through brainstorming. It was, however, not sufficient for the ultimate emergence of the insights, which only came about through the later stages of the workshop that followed up on the initial ideas. Seven out of the eight new customer insights emerged initially in the first part of the workshop. This first part was a continuous reiteration between three types of sensemaking: Noticing & Bracketing, Articulating and Elaborating. During this first part, the cues for inspiration were the data from the survey and ethnography and the individual flow of experience of the participants (both customers and managers).

Comparing the eight new insights (cross-cases analysis) led to the identification of an additional sensemaking stage, that of “Discovery”, which was observed in all eight cases. The discovery stage led to further articulation and elaboration. Thus, new product features and benefits which were put forward in the discovery stage, were subsequently re-formulated in the elaborating and articulating and even in noticing and bracketing stages that followed.

Another interesting pattern was that wherever there were many instances of elaboration leading to discovery instances (e.g. for the color changing formula idea: Elaborating N=17; Discovering N=10). The pattern that seems to appear is that the one leads to the other, giving momentum to the discussion. There can be two interpretations of this phenomenon: one might be that the more interest in an idea, which led to further elaboration, resulted in further discovery. It appeared that as elaboration followed noticing as a stage, discovery as a stage also necessitated further elaboration to follow.

Problem recognition, uses, additional uses and unexpected uses, as well as reasons for buying the product acted as strong discussion instigators, leading to a reframing of understanding, through linking different ideas and contradictory aspects. What was very interesting to observe, was that consistently, in all eight cases, in the discovering stage, when product uses, usage triggers, usage process and problems in use were brought up and discussed in conjunction, that led to the generation of an insight. The customer insight emerged thus in all stages through a group reframing of understanding and through linking initially disconnected customer needs.

The analysis of the data demonstrated that not all insights necessitated the same amount of time to emerge. One would perhaps expect all of them to emerge in the final stages, as the team were working on them simultaneously throughout the workshop. Instead, some came to full fruition earlier, while some others later on. The analysis showed that one aspect that influenced the emergence of the insights earlier rather than later on was the frequency of the reiteration between the sensemaking stages. For those ideas that the discussion reiterated a number of times between stages, that led to clarity, consensus, and ultimately discovery sooner. Another influencing factor was the extent to which there were contradictory elements that needed to be resolved as well as unexpected aspects, emerging through these discussions.

DISCUSSION AND CONCLUSIONS

Contribution to knowledge

The first research question of the study was “*What type of insights emerge from ethnographic vs. traditional survey data vs. collaborative design workshops?*” In line with the ethnography literature that suggests that ethnography is an effective method to reveal unarticulated customer needs (Cooper and Edgett, 2008; Elliott and Jankel-Elliott, 2003; Rosenthal and Capper, 2006), the study demonstrated that ethnographic can data yield customer needs that are not found in survey data. A new finding of this study was that the collaborative design workshop revealed even more customer needs that led to deeper *customer insights* (Table 2). The customer insights that emerged from the CDW were a) *non-obvious* (they had not previously emerged from the survey or ethnographic data) and b) *actionable* (they led to numerous new product ideas). Therefore, this study makes an important contribution to knowledge showing how effective collaborative design workshops can be.

Comparing the three datasets, the survey and the ethnographic reports did not show any evidence of emergence of customer insights in the sense of deeper, hidden meanings and social values (Levin, 1992; Dahan and Hauser, 2000). Instead, the analysis showed an emergence of customer needs in the form of descriptions, in the customers’ own words, of the benefit to be fulfilled by the product or the problems that need to be avoided during usage. One reason that the ethnographic research led to relatively few new insights could be that the analysis by *Agency X* was not conducted using formal coding methods—this could be investigated in further research, as the raw data are available.

The second research question of the study was “*How do customer insights emerge and how do they lead to new product ideas at the front-end of NPD?*” According to the research

findings, a customer insight is *not* an idea, neither a new product idea, nor a solution to a problem; in contrast, the research findings demonstrated that a customer insight is a novel, deeper understanding of a dataset that emerges through a gradual elaboration and sharing of cues of memory and personal experiences. In this study, this happened in the context of a collaborative design workshop.

In contrast to the view of creative psychologists (e.g. Smith, Glenberg, Bjork, 1978; Wertheimer, 1945; Wallas, 1926) who view the insight as the *solution* to the problem, which comes through an analysis of data, the study showed that the emergence of an insight based on finding contradictions and links in customer data, in new ways. The study, therefore, makes another important contribution, by having collected empirical data—*in real time and in-situ*. This is very different to the gestalt stream of psychology literature that has not used real-world data. Secondly, the study contributes to debate in the psychology literature on the sudden (eureka moment) versus the gradual emergence of an insight. In this context, there was a gradual spark, in which product ideas emerged through elaboration. This finding, therefore, indicates that collecting VOC data is the beginning of an important process. The notion of customer insight being as a sudden phenomenon may have to be reexamined because in our real-world cases, the emergence was gradual.

The third research question of the study was “*Can the sensemaking theory be applied to explain how customer insights emerge into the front-end of NPD?*” In line with recent research that views insights as a form of sensemaking, which occurs when individuals restructure their understanding (Klein and Jarosz, 2011), this study applied sensemaking theory in the context of NPD. The findings of the study showed that only when workshop participants started to sense of the data, did customer insights emerge. The coding and analysis indicated that the four stages of sensemaking (Noticing and Bracketing; Articulating; Elaborating; Influencing) were present in the dataset, but not necessarily in that linear form. Instead, there were reiterations, some stages were reappearing and there was the interesting emergence of a new stage. What was missing from the existing sensemaking stages was an epiphany stage, an aha stage, which was named ‘*discovery stage*’, during which insights are generated. The addition of this extra stage, links the insights literature to the sensemaking and expands and extends the collective sensemaking theory. Notably, this answers the call of Mills et al. (2010) for empirical evidence that draws upon the Weick’s framework for analyzing the front-end of NPD.

An additional finding of the study was that the product ideas that emerged during the discovery stage were focused on future product uses and benefits and not only on current product features. This led to a new code ‘new benefits/features’ being added to the ones proposed for systematic observation by Goffin et al. (2012). In the present study therefore, the sensemaking approach facilitated the participants to generate customer-centric new product ideas. This is important, in the NPD context, as customers are interested in the benefits they can gain from new products (Hooley and Saunders, 1993).

This study builds upon the very limited number of studies that investigated sensemaking in groups as opposed to individuals. In the NDP and design context, an important study (Stiglini and Ravazi, 2012) looked at the interplay between conversational and material practices. Our study extends this work to the interactions between customers and managers in a CDW setting, and to the journey from customer insights to detailed product ideas.

In the collaborative design workshop, the sensemaking process also appeared to stimulate participants’ tacit knowledge, as metaphors and stories were used in their discussions. Often participants shared their experiences, either as users or as product managers, and raised contradictions in the discussions. These observations coincide with research that suggests that experienced managers have rich tacit knowledge (Smith, Collins

and Clark, 2005) and that sharing this can lead to productive, creative exchanges (Nemeth, 1992).

Limitations and directions for further research

This study has several limitations. First, the collection of data in real time at the front- end of NPD was only possible by working closely with one organisation. However, this might have affected some of the study findings. For example, the video recording of managers' interactions was only feasible during the seven hours workshop; as a result no other managers' interactions were observed in real time. It is possible therefore, that other factors which could have impacted the generation of customer insights were missed. Secondly, the analysis of the ethnography by *Agency X* could not be observed.

The research raises opportunities for further studies. An interesting avenue would be to explore similar processes in other companies and how they generate customer insights. Another fertile area for further research would also be to explore and compare how other research methods (e.g. lead user workshops) lead to customer insights. Finally, researchers need to observe more instances of managers generating customer insights to generate better understanding.

Implications for practitioners

Although it is widely acknowledged that generating customer insights is a core competence that can contribute towards an increase in productivity and profitability (APQC, 2001), managers are confused as to what a customer insight really is and what is the process that should be followed. This research has strong practical relevance, in that it provides product managers with a clearer perspective of the parameters they need to take into consideration when they identify ethnographic customer insights to generate new product ideas. Firstly, product managers should know that customer insights cannot be generated by surveys or ethnographic studies alone. Identification of customer insights requires an amalgamation of the research methods and collective sensemaking. Secondly, product managers need to create opportunities for cross-functional groups and customers to interact, to gain insights for NPD. Thirdly, a skilled moderator for facilitating workshops was highly appreciated by managers of *Company A*. It is clear that product managers need to work efficiently with agencies but too little is understood about this interaction. Lastly, the results illustrate how product managers can deliberately focus on elaboration and other stages of sensemaking to stimulate groups to generate new product ideas.

SUMMARY

Successful new product development (NPD) is based on gaining deep customer insights from market research methods. A literature review involved a review of articles describing the way in which customer insights are generated from market research. Ethnographic market research and collaborative design workshops were found to be highly rated by practitioners. However, it was found that there is lack of a suitable definition for customer insights, as well as a lack of knowledge on how managers use customer insights generated from VOC methods. A case study methodology was chosen to explore how insights are generated during the front end of NPD. Access was gained to a multinational company which develops and manufactures household cleaning products and owns a number of well-known international brands. The level of access granted to the research team was unique in that both the data collection stages (survey and ethnographic data) and the way managers interpreting this data in a workshop could be studied. Thus the full dataset consisted of a customer needs survey (the baseline of the company's insights); an agency's analysis of customer insights from ethnographic data (based on original videos and photos of visits to customers' homes); and

seven hours of video of a workshop in which managers produced customer insights and generated product ideas.

The findings show that insights emerge through collective sensemaking based on sharing their experiences, rephrasing and elaborating. An immersive and iterative process leads participants to generate customer insights and develop detailed product concepts. A real customer insight is not only a customer need elicited from market research method but also the stream of thought that leads to the clear “discovery” of new product features and benefits. This result has important implications for NPD research—it provided clarity and empirical evidence on the process of generating customer insights are identified—and gives pointers for how product managers can become more effective at stimulating discussions that generating magic moments.

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Appendix A: Total Number of Mentions of Customer Needs drawn from Data Sources

	Customer Needs	Code	Survey Mentions	Ethnography Report Mentions	Workshop Mentions
1.	Trustworthiness	TRUST	2	4	15
2.	Guaranteed results - Proof it works	GUARANTEED; PROOF	0	0	9
3.	Cleaning power	CLEANING; CLEAN; CLEANLINESS	20	8	252
4.	Disinfectant power	DISINFECTING; DISINFECT; DISINFECTION	3	3	109
5.	Stain removal power	STAIN-REMOVAL	16	5	36
6.	Unpleasant smells removal power	SMELL-REMOVAL	2	5	20
7.	Germs elimination	GERM-ELIM	2	0	81
8.	Versatility in use	MANY-MAULTIPLE USES	3	12	10
9.	No side-effects on surfaces	NOT CORROSIVE; DESTROY SURFACE-SAFE	3	1	9
10.	No skin irritation	SKIN-SAFE	2	1	27
11.	Use of hypochlorite to combat skin problems	HANDS-FOCUS	0	0	8
12.	No respiratory problems	BREATHING (PROBLEMS)-SAFE	0	1	7
13.	No color fading	DISCOLORATION-SAFE	2	6	6
14.	Pleasant aroma	AROMA	5	2	47
15.	Whiteness	WHITENING	0	1	33
16.	Hygiene	HYGIENE	2	3	15
17.	Sense of freshness	FRESHNESS	2	0	1
18.	Effectiveness reassurance	EFFECTIVENESS	0	1	18
19.	Protection	PROTECTION	0	1	9
20.	Germ free sponge	SPONGE DISINFECTION	0	0	3
21.	Ease of use	EASE-OF-USE	2	2	0
22.	Fertilizer/pesticide for plants	PLANTS-FOCUS	0	1	8
23.	Clean and allergen-free carpet	CARPETS-FOCUS	0	0	34
24.	Disinfection of cutlery	CUTLERY-FOCUS	0	0	9
25.	Brightness	SHINE	0	0	22
26.	Safe for children	CHILDREN-SAFE	0		17
27.	Gentle cleaning of clothes	CLOTHES-SAFE	0	0	22
28.	Germ free garbage	GARBAGE-FOCUS	0	0	41

Appendix B. Sensemaking Coding Definitions

First order codes	Second order codes	Makro phases of sensemaking
		1. Noticing and Bracketing
Recreating experiences Sources of inspiration	Extracting cues from flow of experiences	
Browsing and collecting	Material memory (cues), Labelling	
		2. Articulating
Coining a new label and filling it with meaning Making knowledge explicit/simple	Framing (so that means this...)	
Imbuing a concept with meaning	Making sense of the circumstance	
Visual referencing	Linking material, cues and abstract categories	
	Verbal articulation	
		3. Elaborating
	Connecting multiple concepts into a broader framework	
Parking ideas Connecting brains Getting in the right frame of mind	Storing, sharing and retrieving mental content	
Capturing ideas Organizing thoughts Building on each other's ideas Walking the client through	Integrating and refining emerging mental structures	
	Interactive talk	
		Discovering
Linking contradictions	Reframing (Epiphanies/ Shifts in understanding)	
New benefits/features	Finding solutions	
		4. Influencing
Communicating meaning	Explaining Persuading about the goodness of an idea	
Actions permitted Actions disallowed	Accounting for choices	

Appendix C. 1st: Results of the Coding of Case Micro Grains Scrub

<i>Sensemaking Makro Codes</i>	Researcher 1	Researcher 2	ICR%	Distinct
Noticing and Bracketing	11	8	73%	8
Articulating	4	3	75%	3
Elaborating	3	3	100%	3
Influencing	0	0	100%	0
Discovering	6	6	100%	6
<i>Systematic Observation Codes</i>				
Uses	6	4	67%	6
Misuses	0	0		0
Workarounds	2	2	100%	2
Problem	11	8	73%	9
Process	4	5	125%	5
Acquisition	2	2	100%	2
Triggers	6	3	50%	6
New Benefits/Features	4	2	50%	3

2nd: Results of the Coding of Case Cleaning Carpets Product

<i>Sensemaking Macro Codes</i>	Researcher 1	Researcher 2	ICR %	Distinct
Noticing and Bracketing	8	7	88%	7
Articulating	3	2	67%	2
Elaborating	4	4	100%	4
Influencing	0	0	100%	0
Discovering	6	5	83%	6
<i>Systematic Observation Codes</i>				
Uses	4	6	150%	4
Misuses	1	1	100%	
Workarounds	1	1	100%	1
Problem	8	6	75%	7
Process	3	5	167%	4
Acquisition	2	2	100%	2
Triggers	5	4	80%	4
New Benefits/Features	3	4	133%	4

Appendix D. CDW Timings of mentions for each new insight and idea

	<i>1. Color changing formula</i>	<i>2. Micro grains scrub</i>	<i>3. Skin products: related to feet, head lice, hand wipes</i>	<i>4. Special self-disinfecting cleaning sponge</i>	<i>5. Product for cleaning carpets</i>	<i>6. Dishwash liquid</i>	<i>7. New, less strong, gentle, sensitive hypochlorite product</i>	<i>8. Hypochlorite-infused garbage bags</i>
DVD 1*	(21:32) (27:14)	No mention recorded	(24:39) (28:33)	(36:00)	No mention recorded	No mention recorded	(23:17)	No mention recorded
DVD 2**	(32:26) (46:16)	No mention recorded	No mention recorded	(19:00) (26:00) (35:23) (37:58) (42:15)	(6:54)	No mention recorded	(12:50)	No mention recorded
DVD 3	(5:00)	(24:39)	No mention recorded	(0:03) (7:00) (16:38)	No mention recorded	(14:15) (56:35)	(7:00) (31:30)	(15:20)
DVD 4	No mention recorded	(0:01)	(9:30)	(30:28)	(3:26)	(9:42)	(9:16) (52:46)	(16:17)
DVD 5	(13:12) (55:55)	(24:22)	(32:41) (52:00)	(53:13)	(40:44)	(5:00)	(1:00) (46:42) (54:56)	No mention recorded

Appendix E. The Stages of the CDW

Stage 3a: Initial discussion on customer needs and brainstorming of new ideas

There were first 75 minutes of initial discussion and brainstorming. This was a useful process, as it enabled participants to start talking about the brand and its advantages and subsequently to start considering opportunities for new products and customer needs, keeping the survey and ethnography results very much on top of their minds.

The moderator set the stage for the workshop by stating that the more relaxed and fun-oriented a group is, the more their creativity is enhanced and the outcomes are improved. She then gave people a very interesting ice-breaking introductory task: “*as a form of introducing ourselves, just give us your first name and tell us what you think you were in your previous life and why*”. This was an interesting creative exercise, as people were using some preferences or tendencies in their lives as pointers to guide them into what they thought they must have been in a previous life. This activity got everyone into an unconventional, out-of-the-box kind of thinking, which proved very creative.

After the icebreaking - getting to know each other - game, they started their discussions by focusing upon the brand. They started by looking at the competitive advantages responsible for the brand’s success: effectiveness, cleaning power, disinfecting power, hygiene, killing germs, whitening effect, versatility/multiple uses, brightness, strong brand name, trustworthiness, and guaranteed results.

The discussion then turned to the uses of the product and its competitive superiority. The participants highlighted that this is the only product that kills all germs and pathogens, even in very demanding cases, in doctors’ practices, hospitals and restaurants. They referred to the consistency in its performance, rendering it a dependable product; they mentioned also the distinctive smell which provides peace of mind, enabling users to feel secure that the particular space is disinfected; and they also indicated that it has very fast results. This last assertion led to an interesting discussion on how long it actually takes to disinfect an area and how one could tell. This problem recognition led to the idea to develop a formula that enables the product to change color when in contact with germs or as a result of the completion of the disinfecting process.

The moderator then asked the group to identify any concerns and issues with the product, in a way leading them to the identification of problems which could act as opportunities: the participants pointed to the strong smell of the product; people, particularly men, finding the smell unpleasant; the potential risk of respiratory problems and dermatological reactions; destroying/discoloring clothes, as well as the fact that it can be dangerous for children and corrosive. The discussion then turned to the different ways the product could be improved, which led to the identification of needs and product ideas.

Stage 3b: Group-work: Further discussion of customer needs- new ideas generation and presentation of the results

The participants were next split into four groups of three. The moderator wanted the three customers to be in different teams rather than together in one team and for the teams to be as cross-functional as possible. All groups were given handouts with the ethnography results drawn for each category of use for the product under study, namely: *use in the bathroom, use in the kitchen, use in the rest of house, use on other surfaces, and use against difficult stains*. Their task was to come up with new product ideas. During group work, a team member was reading the ethnographic findings and the team was producing ideas. All ideas were written on flipcharts and the designer was working on the first draft designs at the same time. Each team subsequently presented their ideas.

Stage 3c: Setting selection criteria and evaluating the emerging ideas

This presentation was then followed by a discussion to set the criteria for the evaluation of the emerging ideas. The agreed criteria were: a) commercial potential, b) competitive advantage, and c) expertise/relevance to the core USP/competence of the brand. All generated ideas were subsequently screened based on these criteria.

Stage 3d: Insights generation & Concept development: linking customer insights with new product ideas

The next stage involved the development of a complete proposition for the R&D department for each of the shortlisted ideas. It was only at this stage that the participants used the word “insight” for the very first time to denote the distillation of all previous discussions on customer needs and problems. Some of the insights which were developed and written on the flipcharts took the form of a customer’s quote “*I would like ...*”, “*I am afraid...*” although they were developed by the managers participating in the workshop. The participants exchanged views and added details to the eight ideas selected, making the key customer insight, the benefit and the design concrete. The designer refined the initial drawings. The overall outcome of the workshop was very rich and the insights generated provided a sound basis for eight new product ideas to emerge. We conceptualize this process as one of “sensemaking” of customer insights.