

# X-ray specs, stickers and colouring in: Seeing beyond the configurator using design probes

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**Abstract.** The broad spectrum of research within the field of MC to date has done much to further knowledge relating to the practical implementation of designing and manufacturing custom, co-designed products. However, research into the customer experience remains limited. There is a need to understand both the nature of the co-design experience in MC, and how to design for it? The selection of research methods used to explore this area appears imperative in uncovering useful and relevant data and insights. This paper discusses the application of design probes as a research method for a means of exploring what the literature refers to as the ‘multifaceted phenomenon’ of customer experience, and introduces a research project using these tools for the construction of conceptual models.

**Keywords.** design probe, touch point, customer experience, customer co-designer, design, research methods, conceptual models, empathic research

## Introduction

Mass customisation (MC) emerged through business practice. As a result, academia has had to catch up, and much of the early literature within the field reflects this (Kumar et al. 2007). The broad spectrum of research within the field

of MC to date has done much to further knowledge relating to the practical implementation of designing and manufacturing custom, co-designed products. There remains limited research however exploring the nature of the MC customer co-design experience. In 2003, Tseng and Piller highlighted the increasing importance of connecting with customers in future developments in MC; “we feel new research on mass customization is especially needed in fields connected with customer interaction and integration” (p521). Six years on, the continuing acknowledgement of the need for further work in this area is exemplified by the call for papers from the 2009 World Conference on Mass Customization & Personalization, whose manifesto is “*to shift the mass customization debate from a mere physical product level to a perspective of total value system and life cycle experience and to go deeper on customer-centric communications*” (MCPC 2009). This recognises the importance of the product, service and experience, and raises questions as to what is the MC customer co-design experience, and how do we design for it? This paper highlights the importance of selecting appropriate research methods when unpacking the nature of a co-design experience, and introduces a research study currently utilizing design probes as part of its mixed-method approach.

## What is the customer co-design experience?

Mass customisation by its very nature consists not only of the tangible product or service offering, but also of the co-design experience for the customer. In this context, whilst design remains a “conscious and intuitive effort to impose meaningful order” (Papanek 1997), the design process becomes a two stage approach, where the customer co-designer becomes a partner in the process of adding value (Reichwald et al. 2004). Acknowledging this central role of the customer co-designer, and the extent to which they are embedded in the design process, is a crucial aspect of understanding and developing an overall MC strategy.

To date, the findings in the MC literature concerning the co-design experience generally fall into one of two areas:

- \* Issues surrounding the contents of the solution space (a conceptual container for the matrix of product possibilities that are made available to a co-designer for any given MC product)
- \* Communication and application of the contents through an appropriate product configurator

Research methods within the field differ; some utilise attempts to recreate an MC purchasing environment, for example work by Kumiawan et al. (2003), and

Kamali and Locker (2002), or else take an empirical approach to understanding the motivations and choices of a consumer as they are asked to go through a pre-selected MC purchasing process, for example work by Huffman and Kahn (1998) and Bee and Khalid (2003). Much of the research concludes with a completed design at the product configurator. Other researchers use quantitative methods to investigate customer perception and understanding of MC without any participation in a co-design experience, for example Fiore et al. (2004) and Dellaert and Dabholkar (2007). Each offers valuable insight into its specific area of focus. However, it is important to recognise that the customisation process cannot be separated from the customised product (Kaplan et al 2007). There appear to be few research studies focussed on the wider aspects of the MC co-design customer experience beyond the specific co-design decisions at a product configurator; little research exists which draws together these issues to help illuminate the wider considerations surrounding the customer co-design experience from co-design to receipt of product, and the now 'fuzzy' practice of designing for co-design.

It becomes important to define what we mean by an MC co-design experience. It is often difficult to define where any customer experience begins and ends. However, to define it as simply the financial transaction and receipt of goods, or in the case of MC as the specific co-design activities at the configurator, is to severely limit opportunities for satisfying and engaging with that customer, and risks leaving their experience to chance. Whilst they may be happy with the final product, what about the perceived quality of the packaging, the demeanour, helpfulness and knowledge of the retail staff, the email confirmation of the order that never came, the switchboard that took 7 button presses to reach an operator, or the six week wait for the product to arrive? We therefore posit that "a co-design experience consists not only of activities that relate to the co-design of the product via the product configurator, but that a co-design experience comprises both tangible and intangible elements, encompassing the entire purchasing experience from the beginning of co-design activity through to the receipt of the customised product and beyond" (Herd et al. 2009a, p194).

According to Schmitt (1999), a business selects stimuli which create the desired customer experience, these are known as 'experience providers'. Gilmore and Pine (1999) refer to these as 'cues', and highlight the importance of each cue portraying a consistent theme to the customer. Also known as product 'touch points' a terminology we use in our research, these "instances of direct contact with either the product or service, or with representations of it by the company or third party" (Meyer and Schwager 2007) serve to construct the customer experience. Touch points can therefore be used to define and describe MC co-design experiences. It is these tangible touch points which make an experience real,

enabling brand to be savoured, remembered and communicated (Slassi 2005). “When a person buys a service, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages – as in a theatrical play – to engage him in a personal way” (Pine and Gilmore 1999). It is important for a mass customiser to consider the touch points within their product offering, as these exist not only within the product itself, but throughout the entire co-design experience. Touch points should not be events, moments or actions which occur at random throughout an experience. Their role is to create a coherent message or narrative through and around the customer experience; “it is utterly important how the company acts in each and every customer touch-point, and that all company activities and messages are reflections of the values that define the image and the brand. At customer touch-points the brand comes through and is realized. This is also where the brand can be easily destroyed” (IASS, p6). This narrative should have not only emotional appeal, but also communicate an authentic message; brands like Caterpillar sell shoes on the back of their rugged work image, while Body Shop customers buy its beliefs and values along with its products (Lewis and Bridger 2004, p39).

We use the model of a customer corridor as a way of mapping MC co-design experiences (see figure 1). The customer corridor represents the broad co-design experience, with the doorways within the corridor describing the key stages that occur within that experience (Herd et al. 2009b). The spaces between the doorways in the customer corridor, for example between product purchase and receipt of product, may offer the most potential for exploring improvements to the co-design experience; as Donald Norman describes “Anytime one system or set of activities abuts another, there must be an interface. Interfaces are where problems arise, where miscommunications and conflicting assumptions collide. Mismatched anything...is a designer’s heaven” (2008, p36). We are looking for what we describe as latent touch points, touch points which are currently missing or un-designed within co-design experiences.

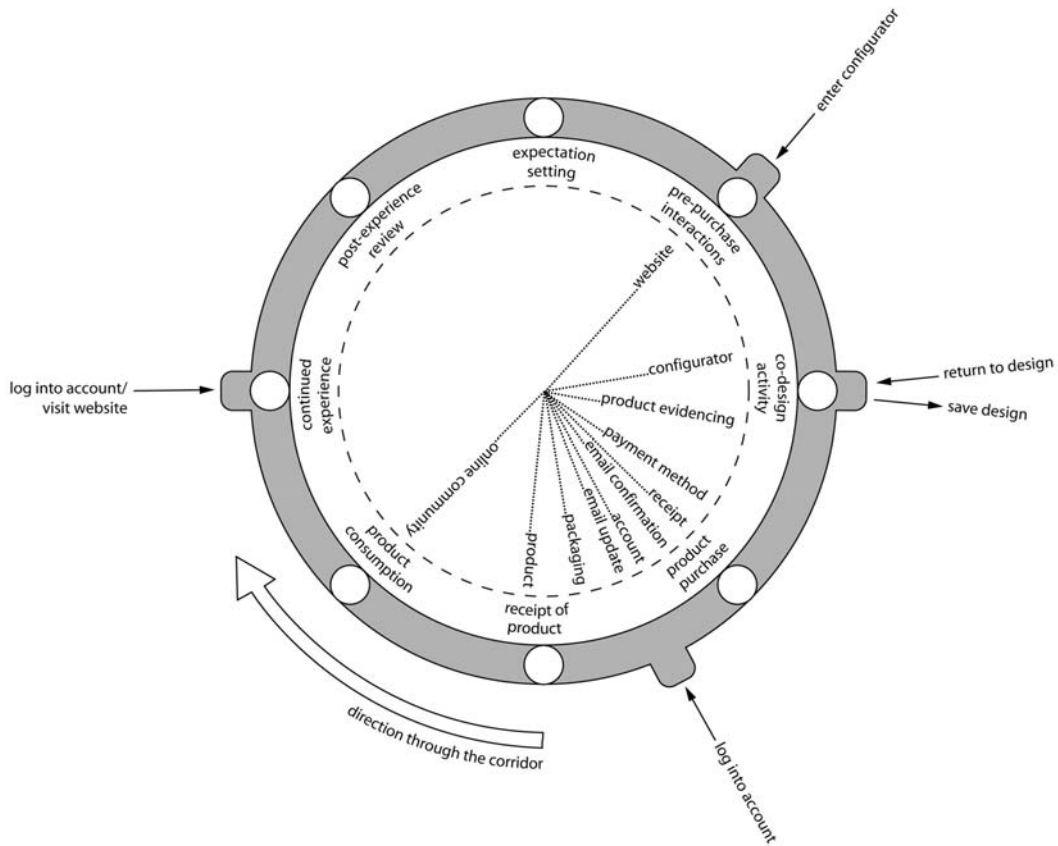


Figure 1. A generic customer corridor for an online purchase (Herd et al. 2009b)

We recognise that an experience is not always a linear route. A useful metaphor is that used by Service Design company LiveWork (Moggridge 2007 p422) who describe on-ramps and off-ramps in a customer experience “...so you’re not talking about the main road of content flowing through, but how people access it, how they leave, what they do with it when they’re finished with it”. This appears particularly relevant to many existing online product configurators where, for example, designs can be saved and returned to at a later date, forums are joined and communities of users become established. As these co-designers become part of social networks, customer corridors cluster together (see figure 2)

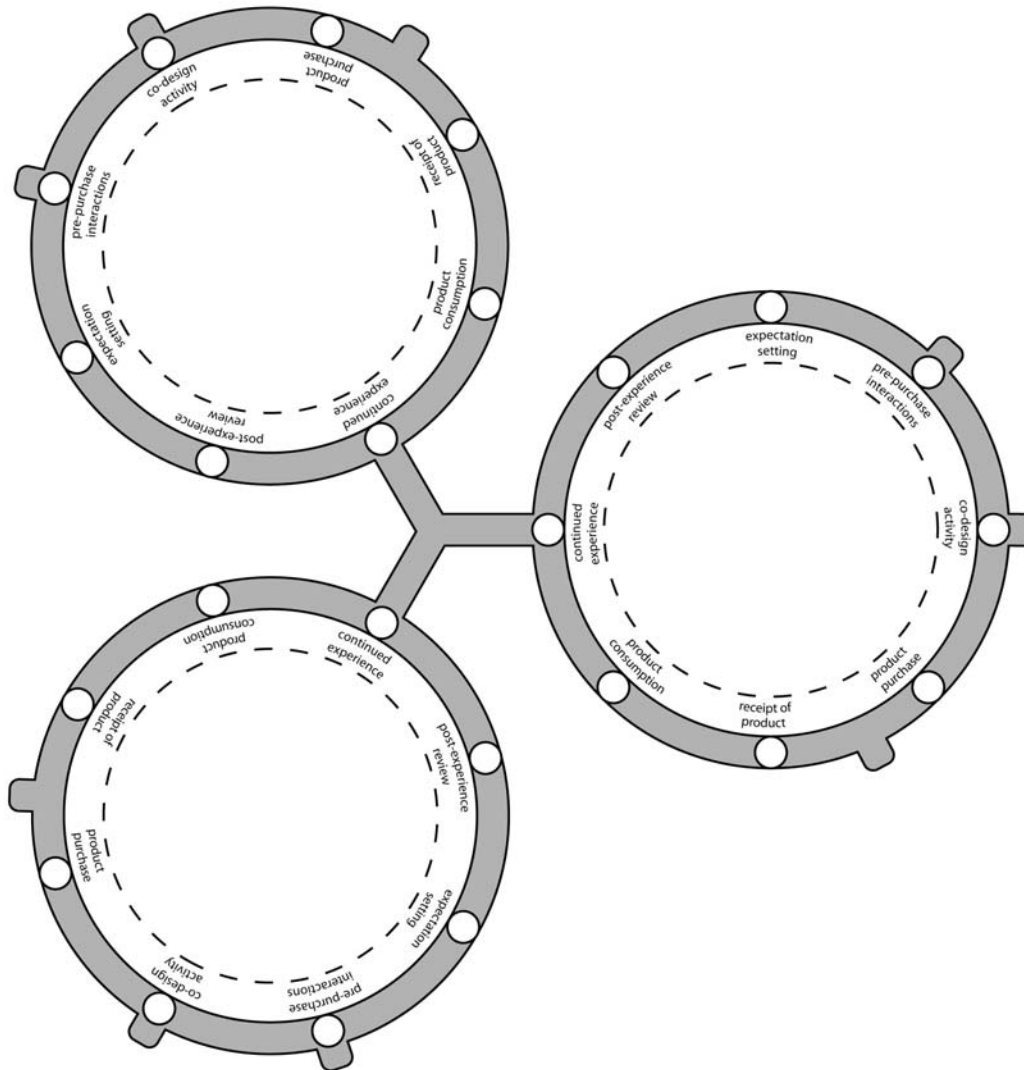


Figure 2. The creation of communities (Herd et al. 2009b)

The mapping of customer experience is valuable in understanding both context and contents of the experience. It can be used to fully evaluate and analyse business processes, or simply as a prompt and prop for discussing intended user experience. In addition, any problems or inconsistencies with current customer experience may be revealed through mapping actual experience against presumed or desired use and experience (CHIFOO 2009)

The customer corridor is therefore useful in mapping what occurs throughout an MC co-design experience. However, to understand the co-design experience we need to go further; we need to understand not only what happens, but why people feel the way that they do, what they feel, when, and how. These often

intangible elements reflect what Desmet and Hekkert 2007 describe as the “multifaceted phenomenon” (p59) of product experience, comprising aesthetic pleasure, attribution of meaning and emotional response. It is this area of investigation where many of the current research methods used in MC fail to capture this multifaceted insight into MC co-design experiences.

## Doing the right kind of research: probing for inspiration

As with all research, the selection of research method is paramount in ultimately giving credence to, or calling into question, the findings of the enquiry (Clough and Nutbrown 2008, px). When exploring customer experience, we need to move beyond traditional research methods, many of which have been shown to fail to capture opportunities for product innovation; “Traditional market research asks people questions about what they do and the design is based on what they say. But there is a difference between what they say they do and what they really do” (Myerson 2001). User-focussed innovation requires user-focussed research methods, user insight stems from empathic research, not market research. These empathic design research tools differ from market research in their divergent rather than convergent nature; market research may look at 100 average people and gain one insight, whilst empathic research may look at 10 extreme product users and gain 100 insights. Whilst both are useful, it is important to use the right tool at the right time. Market research techniques can help uncover explicit user needs, but latent user needs will only emerge through the use of empathic design research tools (South 2004).

The selection of appropriate research methods is therefore paramount in deriving insightful data relating to the co-design experience; alternative approaches are needed to elicit subtle, tacit customer needs, moving beyond the view of a product as a set of performance features and functions, and considering the implications of the physical and emotional context of product use (Rosenthal and Capper 2006, p216). We need to find ways to empathise with customers; “we need not only a window into the user’s life, but also an explanation of how he sees things in that window” (Mattelmäki 2003, p121). As Fulton Suri (2003, p42) describes, our “subjective ability to make empathic inferences from objective data is a key component of understanding what matters to people at this more emotional level”. These approaches to customer co-design research in MC may reveal elements of customer experience which have not yet been identified, thereby offering new opportunities for design and potential market advantage.

One of the problems with current research methods in the field of MC are that many approaches provide only a snapshot of time (for example at the configurator), this reveals very little of the wider customer co-design experience. This becomes particularly relevant when we aim to understand the emotional reaction to specific events within a timeframe which, for some purchases, may last up to eight weeks. It is unlikely during a follow up interview that an accurate memory of emotions and actions will be recounted, (for example the emotional response at the moment of payment) when this view is likely to be later distorted by the satisfaction or dissatisfaction with the final product and overall experience. Likewise the 'recreation' of a website to evaluate peoples clicks through a custom site are lacking any engagement with brand and will to purchase, which are an intrinsic part of any customer experience. Research methods are needed which can explore a prolonged period of time, and situations which the research team would otherwise not have access to.

Our research focuses on the development of conceptual models and tools to assist in designing for co-design, and uses a mixed-method approach. This paper describes and reflects upon the use of a design probe for gaining insight into MC customer co-design experiences. Defined by Mattelmäki (2003, p120) as "self documentation packages for gathering data on people's actions and the contexts in which they take place...[probes] provide people with tools for reflecting and projecting their opinions and feelings". Their advantage lies in their "rich, textured understanding of user need" (Gilmore 2002, p31), recognising that "the truth is that there is no average person out there" (p32). Since their inception in 1999, probes have been adapted and used as research methods in a variety of contexts, and for a range of purposes. Despite the differences, their essence remains what Gaver et al. (2004) describe as "probology"; an approach that uses probes to encourage "subjective engagement, empathetic interpretation, and a pervasive sense of uncertainty as positive values for design".

Probes are "collections of evocative tasks meant to elicit inspirational responses from people – not comprehensive information about them, but fragmentary clues about their lives and thoughts" (Gaver et al. 2004). They are a designers tool for creating a dialogue between participants and themselves, not intended to provide design solutions, but rather to create an empathic understanding of individuals and their experiences; "Rather than producing lists of facts about our volunteers, the Probes encourage us to tell stories about them" (Gaver et al. 2004, p55). In contrast to most research methods that strive for objectivity and impersonal results though controlled procedures, probes seek to actively embrace the subjectivity of its method. They enable designers to construct a story of an experience, based on real life rather than on constructed personas, helping to avoid preconceptions and assumptions about users, products



and their experiences. This is valuable since summarising returns risks producing an “average” picture that fails to capture insight into the individual (something particularly relevant to MC), filtering out the unusual moments that can be the most interesting (Gaver et al. 2004, p56). They enable us to see beyond what appears to be happening, to take a view from the inside outwards. Carrying out this research with small numbers of participants using these methods also falls inline with the nature of MC where everyone is an individual; as Moggridge (2007) describes “Empathic research methods...if skilfully used, can yield much inspiration from small numbers of subjects” (p434). The advantage of probes within MC research therefore, is their ability to be sent out into the co-design environment with minimal impact from the research team, and to gather insights into individual experiences.

We have a three stage approach to data gathering within this study:

- \* Literature review, both in MC and adjoining disciplines such as design, Customer Experience Management (CEM) and Customer Relationship Management (CRM), which forms the foundation of our understanding
- \* The purchase of a number of MC products to create frameworks of experience (customer corridors); exploring the experience of being a co-designer
- \* Constructing and giving design probes to co-designers to track their MC purchase, followed up by a semi-structured interview to further unpack their experience

The use of design probes requires a balance between both unguided, intuitive and inspirational information gathering, which is implicit to the nature of the research method, whilst at the same time enabling information to be obtained which falls within the boundaries of the research aims. This underlying tension exemplifies the nature of the research method in its inspirational rather than empirical nature, and supports the use of a mixed-methods approach.

## Constructing the research tools: design probe kits

The following areas were explored using design probes:

- \* Insight into what events, and corresponding touch points, occur during a specific co-design experience
- \* Insight into the emotional reaction/thoughts associated with those events/touch points
- \* Insight into the social networks of the customer co-designer with regards to their co-design experience

- \* Assistance in the construction of a persona, and storytelling of an individuals experience

The experiences captured within the design probes were to be viewed against the previously established customer corridors from our MC purchases, which helps to view the findings in context (for example mapping touch points against a timeframe), enabling a prior understanding of a specific co-design experience for each company selected. This has the benefit of removing the necessity for the probe to inform the researcher of accurate representative information about the purchasing experience, but rather it enables a focus on the interpretation of events and the associated emotional reactions. The design probes were retained for one week after the custom product arrives and then returned to the researcher. This was followed up by an interview in which the co-design experience was further explored. As Robertson (2006) discusses, probe results can provide both prompts for the interview, and can help in bridging the distance between the researcher and volunteer. The completed materials offer clear ideas and insights into the participants experience prior to interview and allows the interview schedule and manner to be adjusted to better suit the needs and specific context of each participant.

The design probe kits for exploring customer co-design were first piloted to uncover potential problems/issues with use (the development of the probes is discussed in more detail in Herd et al 2009a). The resulting kits were distributed to four participants in the study. The profile of the participant was unimportant, more important was a genuine desire to purchase a custom product from one of the companies on offer. A £50 thank you payment was offered to participants for their time upon completion of the probe and follow up interview; this payment was deemed high enough to generate interest whilst deliberately less than the price of any of the custom products on offer on the websites at that time.

Five companies were offered from which a custom purchase could be made (bag, trainer or watch) either online or in-store:

- \* Nike ID
- \* Freitag
- \* Timbuk2
- \* Pumas Mongolian BBQ
- \* K-Swiss

Probe kits are not commercially available as standardised items, and the literature offers no specific rules for how they should be designed and applied. Despite this lack of clear guidance, a review of relevant research highlights a range of commonalities; these can be used as indicative of how probes can work

successfully. Mattelmäki (2003, p123) defines four key elements that make up a probe kit:

- \* Elements for visual documentation (typically a camera) for documenting the participants life, material and social environment, and their interpretation of these
- \* A diary, offering an understanding of how the participants actions, routines, moods and thoughts are situated within their everyday lives
- \* Specific issues that can be probed with illustrated question cards, maps and task books. These activities can also consist of open questions about opinions and attitudes
- \* 'Props' designed to facilitate data gathering, for example, instructions, 'reminders' etc.

In attempting to gain insight into the co-design experience, we developed a range of components within our design probe kit (see figure 3). Each item had basic instructions for use. The activities were guided in part by their names/labelling, which fell into three categories; 'CAPTURE IT' tasks required a photograph from the digital camera and photo printer supplied, 'DRAW IT' tasks required a diagram, and 'DESCRIBE IT' and 'LIST IT' tasks entailed a written response. 'TELL ME STUFF' involved the use of the dictophone, supplied with the kit.



Figure 3. 'So...what's inside your design probe...?' instruction card

The design of the probe components is important since research suggests that good design and attention to detail increases the motivation to participate (Lucero and Mattelmäki 2007, p173). The design probe must encourage participation whilst not overly burdening the participant with work. Functionality and usability are key components of probe design and attention must be paid to both the needs of the participant and the researcher, considering how the information will be documented, collected, communicated and stored (Mattelmäki 2006, p75-6). Our probe components used a range of media and response types in an attempt to engage participants preference and style of thinking and working (see figure 4).



Figure 4. The design probe kit (from top: four assembled design probe kits, participant diary, touch point map and sticker books, task cards, and dictaphone with instructional wrap around)

The components were seeking information across a range of areas; these included the participants perceptions of themselves, the company they were buying from and their thoughts about customisation, the touch points they experienced, and how these made them feel, their social network with regards to their co-design experience (who did they tell about their co-design experience/product), and their emotions from moment of purchase through to one week after the product arrived. As expected with a research method of this type, results were varied in the level of completion, primarily due to the participants response to different components and ways of working within the probe kit.

One of the challenges of using design probes is their intrinsic nature of being sent 'out there' beyond the researchers control; this is particularly challenging with the lengthy MC product lead times, there is no way of knowing whether the data is being gathered. This was experienced during the pilot (one of the two probes was eventually returned unused), and during the study (one probe was returned unused but then passed to another participant. Two other participants had to be contacted to enquire whether or not a purchase had been made when no contact was made after two months). One method of retaining contact with participants was the use of postcard stickers. These were supplied as an A4 sheet containing 4 stickers (see figure 5). Each stamped, self-addressed sticker had a 'CAPTURE IT' photography task (the photo for which then became the postcard) and a written task. They retained contact between the participant and the researcher. This was particularly important when the anticipated period between purchase and arrival of MC products from these five companies (based on our customer corridors), varied from 6-50 days. The first postcard in the set informs the researcher of the purchase date and company purchased from, (from which an arrival date can be estimated for the product); this enables a basic means of tracking the probe use.

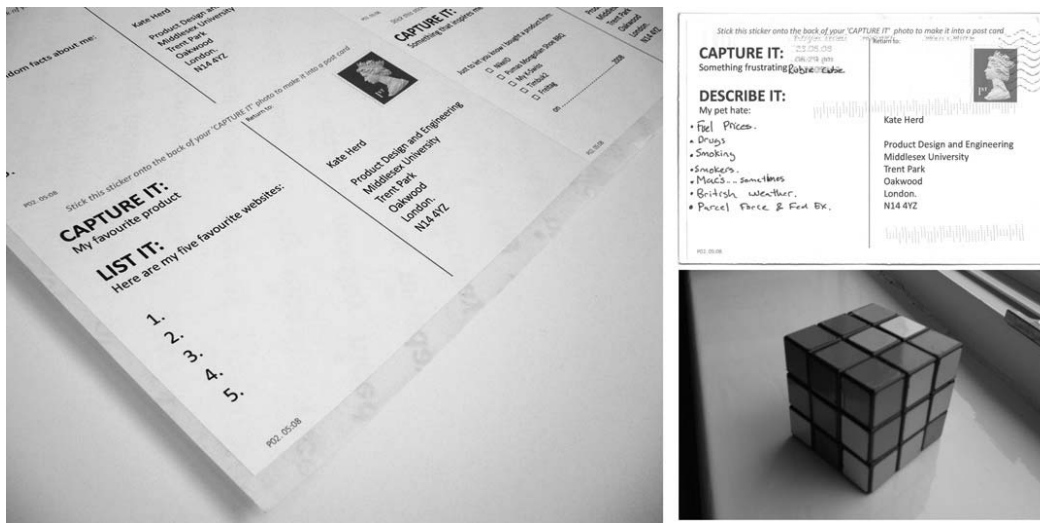


Figure 5. Postcard sticker sheet, plus one completed and returned postcard (CAPTURE IT task: something frustrating)

## What we've found so far...

At the time of writing, not all probe kits have been returned to the authors, nor have all the interviews been completed. This paper does not seek to and discuss a full analysis of the findings at this time. Instead it seeks to discuss the research needs for gaining insight into the co-design experience, and to introduce the research methods used in this study. Further work will report on the findings.

However an initial review of the probe kits has already revealed some valuable insights and stories to tell about individuals experience as co-designers. We can tell stories about their experience; "...they sent you a little link, that showed you your bag...and I sorta just, that's, that's what I just kept going, I went back to back to that link, and...just to, just to look at it...and then I sent that link to a couple of my friends" (Participant 02 personal interview – FREITAG purchase). These tell us of their individual customer journey, and emphasise the importance of touch points in establishing a coherent experience and a connection with the company; "Company emailed my invoice; nothing special really. Said my order has been shipped; they already mentioned in a previous email" (Participant 03 diary entry – Nike iD purchase). We can also learn what it means to an individual to own an MC product; "I love the bag...I haven't stopped, it has like, a special place...it sits on top of the fridge" (Participant 02 personal interview – FREITAG purchase).

These stories, and those yet to be heard, offer the foundation for understanding what it means to be a co-designer. Every experience is different, and as designers for co-design we need to put on our x-ray specs to really see what's going on for our customer co-designers, beyond the mere actions at the product configurator. What we then need to discover, is how to design for this co-design experience. This needs to happen by looking not only at what is happening now, but by looking at what should or could be happening through the identification of latent customer needs. Our work is leading towards a framework for guiding designing for co-design, through the use of conceptual models and tools.

The analysis already appears challenging by the very nature of the research method. It is important to remember the purpose of the method; as Mattelmäki (2006) describes, the results are not about producing “general or comprehensive knowledge”, but rather constituting an introduction to the next stages of work, and as “an instrument for determining further questions” (p60). The findings from the probes will inform insights into both MC co-design experiences, but also into the development and applicability of design probes as a research method for this field. There is much work to be done in establishing appropriate methods of work, and in learning from other disciplines.

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