Product Lifetimes And The Environment
2017 - Conference Proceedings
C. Bakker and R. Mugge (Eds.)

DOI: 10.3233/978-1-61499-820-4-482

PLATE conference
Delft University of Technology
8-10 November 2017

PLATE
Product Lifetimes And The Environment

Consumer intervention mapping: a tool for the imagining of re-distributed manufacturing futures with consumers in the loop

Sinclair M.

Loughborough Design School, Loughborough, United Kingdom

Introduction

This short paper describes work carried out as part of the 'Business as Unusual – Designing Products with Consumers in the Loop' feasibility study, which forms part of the EPSRC-ESRC (UK) funded Network in Consumer Goods, Big Data and Re-Distributed Manufacturing (RECODE)[1]. A multidisciplinary team from Cranfield University, Open University, Imperial College London and Loughborough University, and practicing industry leaders in the fields of sustainability, manufacture, big data, circular economy and consumer goods, were involved in the delivery of this feasibility study.

Consumer Intervention Mapping

Within Customer Relationship Management (CRM), Consumer Touchpoints (Dahan, Soukhoroukova, & Spann, 2010) are a well-established tool for understanding the interactions between a brand and its customers (Baxendale, Macdonald, & Wilson, 2015; Hogan, Almquist, & Glynn, 2005; Martin, Rankin, & Bolinger, 2011). The purpose of a consumer touchpoint diagram is to show all potential opportunities customers to "experience" the brand – for example advertising, packaging, after-sales service, etc. Touchpoint diagrams have been used in both academia and industry, to understand customer-brand relationships in sectors as diverse as energy supply, charities and consumer electronics. However, CRM typically focuses on interactions which the brand can control, ignoring those which brands are unable to influence. Consumer interventions such as post-purchase modification, repair and re-sale have therefore received little attention.

Within service design (Voss & Zomerdijk, 2010), Customer Journey Maps (CJM's) (Government, 2007) are employed as a method for documenting ways in which customers experience product-service systems. CJM's utilise touchpoints to understand how consumers perceive and relate to brands over a relevant timescale or throughout a relevant process. However in order to manage the chaotic feedback resulting from every customer having their own journey, brands typically employ personas to 'summarise' a subset of consumers (Dhebar, 2013). This inevitably focuses attention on a brand's core customers while excluding its outliers; as a result opinions of customers engaging with a brand in new or unexpected ways can be overlooked. In addition, in conventional manufacturing paradigms, customers appear at the end of the value chain (Gereffi & Frederick, 2010), i.e. the value chain is taken to end when a product is sold. In a re-Distributed Manufacturing (RdM) paradigm (EPSRC, 2013), customers can be engaged earlier (Sinclair & Campbell, 2014), and the value chain extended further. CRM literature has not previously given attention to CJM's within NPD, and has therefore neglected instances where customers engage with the design and production of products and services, rather than just their consumption.

We have introduced the concept of Consumer Intervention Mapping to visualise opportunities for consumers to intervene in intended or expected product lifecycles. In line with CJM methodology it takes a user-centric perspective, but untypically gives attention to outliers as well as core customers. Crucially, it allows journeys to be mapped throughout the entire product lifecycle, from design and manufacture, through sale and use, to repair, re-sale and disposal. A Consumer Intervention Map (CIM) can therefore explore new models of production and consumption which fall into re-distributed and circular economy paradigms (Moreno & Charnley, 2016).

In common with existing CJM models, the CIM depicts the customer journey space at increasing levels of detail. The widest level comprises three phases (Davis & Dunn, 2002): Purchase, Pre-Purchase and Post-Purchase. At the intermediary level, six phases (Chan & Mauborgne, 2000; Stein & Ramaseshan, 2016; Yohn, 2013) model the NPD process through to Usage. Finally at the narrowest level of detail, 18 discrete phases are represented (Chan & Mauborgne, 2000; Moreno & Charnley, 2016; Stein & Ramaseshan, 2016; Yohn, 2013). Following a systematic review of the literature, the map has been populated with relevant touchpoints, i.e. those where consumers directly and intentionally intervene to alter the brand's intended, or expected, customer journey (https://doi.org/10.17028/rd.lboro.4772275.v1). Passive touchpoints (for example

[1] *The full report from this study will be available at http://www.recode-network.com/ in Q2 2017*

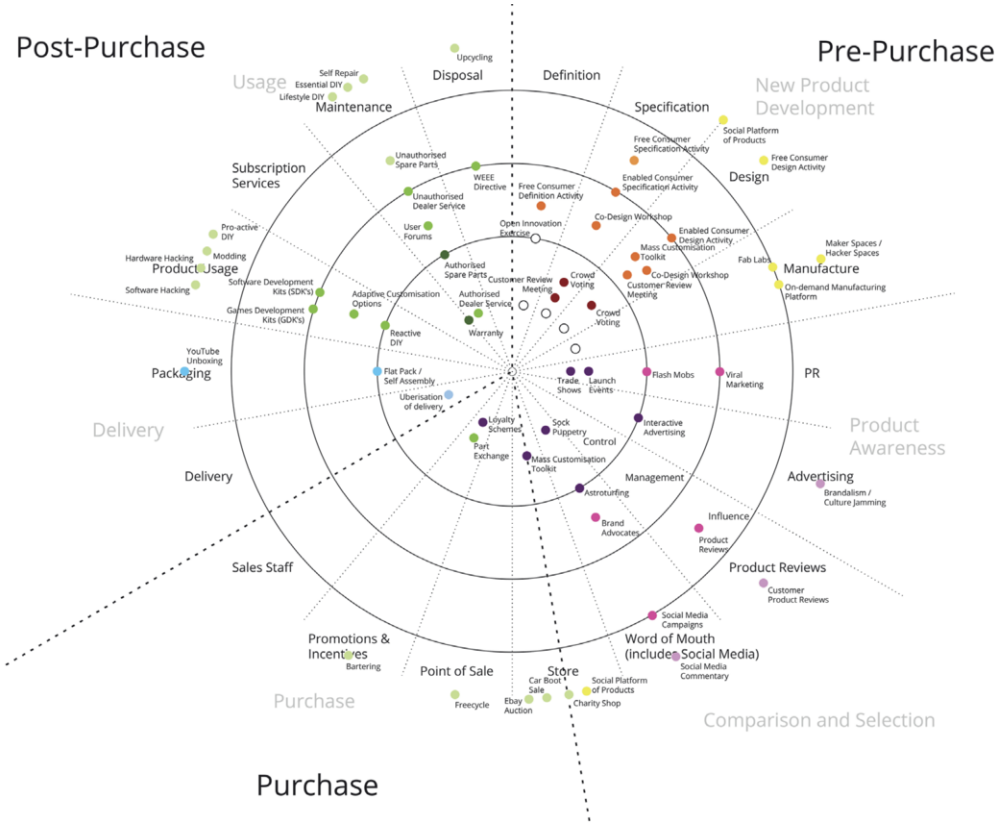

Figure 1. Consumer Intervention Map fully populated with intervention touchpoints.

magazine advertising or sales staff interactions) that do not involve consumer intervention are excluded. Finally, the identified touchpoints are mapped to their appropriate phases in the product lifecycle (Figure 1). Colour coding is used to identify touchpoints as occurring at different stages in the product lifecycle – manufacturing (orange), communication (pink), supply (blue) and usage (green); these are coloured darker or lighter according to the degree of intentionality a brand or manufacturer has in allowing consumers to intervene at this touchpoint.

Future Scenarios of Consumers in the Loop

Scenario planning is a methodology widely used by industry as a strategic planning tool which "aims to rediscover the original entrepreneurial power of foresight in contexts of change, complexity, and uncertainty. It is precisely in these contexts – not in stable times – that the real opportunities lie to gain competitive advantage through strategy" (Wack, 1985). Envisioning future scenarios enables companies to understand how the future might look based on the critical uncertainties facing them. The most common approach is the 'two axes method', allowing four contrasting scenarios to be generated (Government Office for Science, 2009). These visions can then be used for targeting shifts in business mind-set, strategy and activity.

In line with the aims of the RECODE network, this study's vision of RdM is based on three key assertions – that manufacturing is localised, people are involved in the design of their products, and overall resource use is low. Based on these three founding concepts, two critical uncertainties (or in this case, opportunities) are identified:

- *Product Longevity:* The length of the lifecycle of different types of products can vary greatly, from durables to disposables. Short life cycle products can include items such as food, personal care, and fashion; long life cycle products can include items such as electronic goods, furniture and homewares.

- *Consumer Design Drivers:* The type of consumer engagement in the process can vary greatly, depending on the types of user data and mechanisms of interaction available. Consumer inspired design occurs when large amounts of anonymised trend data is available to help direct design; consumer-led design occurs when individual users are able to be more hands on in driving design.

These uncertainties are used to create two axes and identify four quadrants for scenario planning. Each scenario describes a future of RdM based on four core factors: Design (is it carried out by consumers, or by

experts?); Technology: (are important developments needed to support the supply chains, production, or consumer engagement?); Data: (is the most available and appropriate data used for consumer engagement big or small?); and Companies: (are they large multinationals or smaller local companies?).

Four scenarios based on these core factors have been developed (Figure 2) as follows:

1. CIRCULAR CONSUMABLES: Circular products with short life cycles are designed by gathering crowd sourced data to understand the needs of many, then produced, consumed, and recycled in a localised system.

2. DEMOCRATIC DESIRABLES: Connected products with extended life cycles are designed by monitoring life cycle data collected from embedded sensors, then produced, maintained and exchanged in a localised system.

3. TAILORED TEMPORARIES: Circular products with short life cycles are designed by individual consumers who tailor their products through dedicated online portals, then personalised, used, and recycled in a localised system.

4. ENGAGING ENDURABLES: Durable products with very long life cycles are designed by individual customers who work with makers to customise their purchases, then crafted and exchanged in localised systems.

Imagining re-Distributed Manufacturing with Consumers in the Loop

Based on the theoretical foundation described, two workshop activities have previously been devised and validated (materials for both workshop activities are available at: https://doi.org/10.6084/m9.figshare.4749727.v2).

The first of these involves the use of a toolkit to build future RdM scenarios. Working in the context of the four core factors previously described, participants are required to

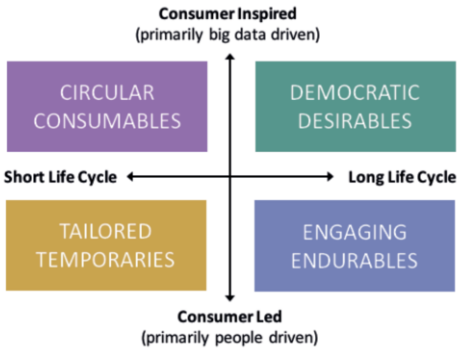

Figure 2. RdM scenarios.

Figure 3. Example RdM lifecycle scenario.

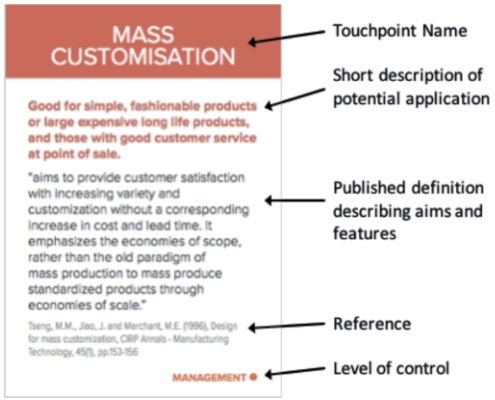

Figure 4. Layout of example customer interaction card.

consider the product lifecycle of a chosen product with regard to its design, purchase, usage and disposal. From previous exercises, a number of compelling stories have been created (Figure 3), identifying novel business models that may emerge as a result of local manufacturing with a low throughput of resources.

The second workshop activity involves participants creating a customer journey map through the new touchpoints, interactions and services needed to support new business models such as those generated in workshop activity 1. To help participants generate visions of their customer journeys, a set of Customer Interaction Cards has been developed (Figure 4). Method cards such as these are used widely in design practice as tools for enabling collaborative ideas exchange, and allowing participants to visualise and converge on concepts together (Wölfel & Merritt, 2013).

These cards, when used in conjunction with the CIM, enable participants to plot detailed and specific customer journeys (Figure 5). More generally, outputs from workshops conducted to date have typically revealed opportunities for re-Distributed business models in three main areas:

- *Collaboration:* By giving more control customers during the development of products, better communication can be facilitated. This could lead to stronger relationships between companies and people that last the full duration of the product lifecycle.

- *Responsiveness:* Closer relationships can also build trust and feedback loops between companies and customers. This enables more flexibility, and an ability to respond and adapt to user needs and other uncertainties.

- *Business Models:* More responsive modes of operation could unlock new business opportunities in RdM, enabled by new manufacturing technologies and customer engagement.

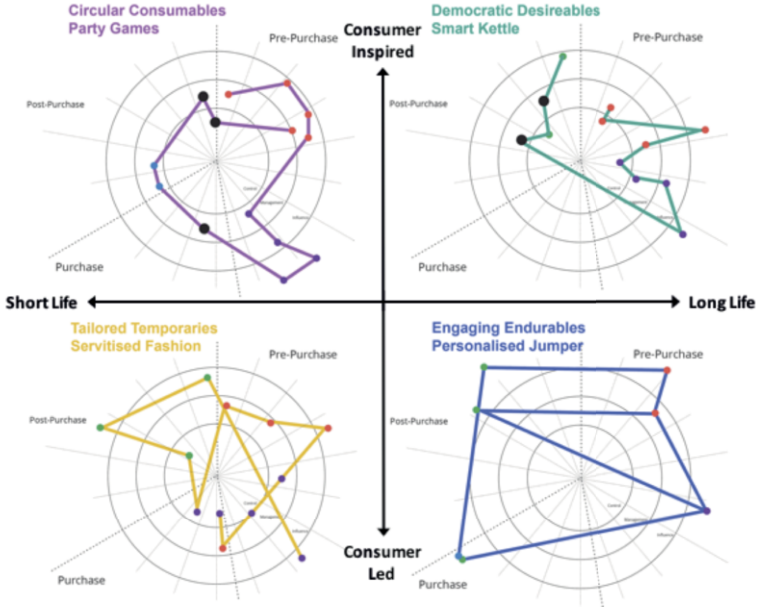

Figure 5. Workshop generated customer journey.

References

Baxendale, S.; Macdonald, E.K. and Wilson, H.N. (2015), The Impact of Different Touchpoints on Brand Consideration, *Journal of Retailing*, 91(2), pp. 235-253.

Chan, K.W. and Mauborgne, R. (2000), Knowing a winning business idea when you see one, *Harvard Business Review*, 78(5), pp.129-138

Dahan, E., Soukhoroukova, A., & Spann, M. (2010). New product Development 2.0: Preference Markets. *Journal of Product Innovation Management , 27*(7), 937-954.

Davis, S. M. and Dunn, M. (2002), *Building the brand-driven business: Operationalize your brand to drive profitable growth*, San Francisco: Jossey-Bass

Dhebar, A. (2013), Toward a compelling customer touchpoint architecture, *Business Horizons*, 56(2), pp. 199-205

EPSRC (2013), *Re-Distributed Manufacturing Workshop Report*, [online], available from: https://www.epsrc.ac.uk/newsevents/pubs/re-distributed-manufacturing-workshop-report/

Gereffi, G. and Frederick, S. (2010), *The global apparel value chain, trade and the crisis: challenges and opportunities for developing countries*, Policy Research Working Paper 5281, Washington DC: The World Bank

Government Office for Science. (2009). *Scenario Planning: Guidance Note.* Foresight Horizon Scanning Centre, London.

H.M. Government (2007), *Customer Journey Mapping: Guide for Practitioners* [online], available from: http://webarchive.nationalarchives.gov.uk/+/http:/www.cabinetoffice.gov.uk/media/123970/journey_mapping1.pdf

Hogan, S. Almquist, E. and Glynn, S.E. (2005), Brand-building: finding the touchpoints that count, *Journal of Business Strategy*, 26(2), pp. 11-18

Martin, A.M.; Rankin, Y.A.; and Bolinger, J. (2011), Client TouchPoint Modeling: Understanding Client Interactions in the Context of Service Delivery, *Proceedings of CHI 2011,* May 7-12, Vancouver

Moreno, M. and Charnley, F. (2016). Can Re-distributed Manufacturing and Digital Intelligence Enable a Regenerative Economy? An Integrative Literature Review, *Sustainable Design and Manufacturing 2016* (pp. 563-575), Springer International Publishing

Sinclair, M. and Campbell, R.I. (2014), A Classification of Consumer Involvement in New Product Development, *Proceedings of the Design Research Society Conference 2014*, 15-19 June, Umeå, Sweden

Stein, A. and Ramaseshan, B. (2016), Towards the identification of customer experience touch point elements, *Journal of Retailing and Consumer Services*, 30, pp.8-19

Voss, C.A. and Zomerdijk, L.G. (2010), Service Design for Experience-Centric Services, *Journal of Service Research*, 13(1), pp. 67-82

Wack, P. (1985, September-October). Scenarios: Uncharted Waters Ahead. *Harvard Business Review*

Wölfel, C., & Merritt, T. (2013). Method Card Design Dimensions: A Survey of Card-Based Design Tools. In P. Kotzé, G. Marsden, G. Lindgaard, J. Wesson, & M. Winckler (Ed.), *Human-Computer Interaction – INTERACT 2013*. 8117. Berlin: Springer.

Yohn, D.L. (2013), *Brand Touchpoint Wheel Worksheet*, [online], available from http://deniseleeyohn.com/wp-content/uploads/2013/12/WGBD-Download-Brand-Touchpoint-Wheel-Worksheet.pdf