Extending the mind: digital devices and the transformation of consumer practices

Introduction

Artificial intelligence that can change the way we live is less of a future possibility and more a present reality. Social Robots that help the elderly, play children's games and learn from their environment in order to adapt and interact with humans are some of the latest breakthroughs (The Guardian, 2015). Such technological developments may make some people feel uneasy - perhaps a car's cruise control function or robot vacuum cleaners are more familiar robotic technology advances that rest more comfortably with people. Even less extreme, but much more common, technological advances sees the use of digital devices and software applications being adopted by many and integrated into their everyday lives. For instance, wearable technology and fitness and weight loss apps that track performance, set goals and provide progress reports are amongst the most popular smartphone apps of 2015 (Techradar, 2015). GPS on smartphones is offered via Google Maps so there is little need to know where you are going or prepare a journey in advance or even be able to read a map accurately. Apps such as *Timehop* reminds users of specific memories once posted on social networks, providing personalized material to reflect on and be nostalgic about. In relation to consumption practices, a wide variety of applications are routinely used via smartphones, tablets and laptop computers, and are consequently changing the way that people engage in practices and the way that people consume more generally. For instance, 100 million monthly active users of *Pinterest* search, pin and share things they desire (Fortune, 2015) and can make purchases of these objects via the site. Nearly 50% of people reported using their smartphones while shopping for food and a third use their smartphones to find recipes as a matter of routine (Allrecipes.com, 2013). What these examples tell us is that there is a growing delegation of everyday practices to technology and it is clear that consumption has been altered and enhanced by such advances in digital technology.

In this chapter we explore the growing digitisation of consumer practices from a perspective of how human and non-human actors come together in configuring consumption practices. In particular, we focus on the ways in which consumers' cognitive abilities are apparently extended by and externalised to digital technologies. In particular, we focus on consumers' knowledge, imagination and memory related to a given practice or consumption object. To do this, we draw on data from a large, on-going study related to digital virtual consumption conducted over the last eight years, which enables us to consider how digital devices and the various platforms and software applications that are accessed through them are integrated in and consequently transform consumption practices. We identify the kinds of new work that is required from consumers in terms of using digital technology in consumption practices – i.e., developing skills, knowledge, competence and a commitment to digital technologies. We also consider the implications of this for practice and for the consumption experience.

Digital devices as consumer mind extensions

Our starting point is that know-how is central to carrying out any practice. Know-how or competence is best understood as distributed between the practitioner, other people, her tools and her materials (Watson and Shove, 2008). This translates into functioning human-non-human hybrids (Latour, 1993), companion species (Haraway, 1991) or co-agents (Michael, 2000) through which interconnected expertise and skills embodied in humans and embedded in nonhuman companions (Dant, 2005) coalesce in practice. Thus, and to borrow from Watson and Shove's (2008) example of fast drying paint, painting, like other practices is something achieved in the 'doing' that brings together disparate and fragmented forms of knowledge (in the human, in the paint, the brushes and their relation to the door). Knowledge scattered across these points are actively woven together.

A consumer using digital devices to construct desire for an object, or seeking knowledge to carry out consumption supported practices, like cooking or motoring, is a very different consumer, with a new repertoire of capabilities and skills. This does not mean that the consumer has become less skilled, but rather that a re-distribution of skills between people and technology takes place in practice. In this re-distribution, the non-human companion, whether it is the shopping cart (Cochoy, 2008), the freezer (Hand and Shove, 2007) or the digital device, comes to absorb some of the competence and knowledge, and therefore agency, previously embodied in the individual carrying out the practice. If we accept that possibility – that consumers and artefacts are best approached not as discrete entities but rather as hybrids – then the suggestion that digital devices and consumers form a hybrid cognitive system is palatable.   After all, what is scattered across material artefacts and instruction manuals that spell out how to properly use these in practice is written about at the level of knowledge. Watson and Shove (2008) write about 'hybridised and distributed knowledge systems', and Dant (2005) differentiates between embodied human knowledge and embedded non-human knowledge, and those captured in instruction manuals. How do we describe then, the knowledge captured by the digital device?

We use the concept of extended mind as a framework with which to view the use of digital devices in a variety of consumption practices. The premise of Clark and Chalmers' (1998) work on extended mind recognises that humans make use of and rely on various external sources to enhance their cognitive abilities, which consequently informs and transforms the practices in which they engage. As a simple example, when I use a mobile phone to call someone, I do not need to remember the telephone number – the phone does that for me by saving the name and number in a list of contacts. In this way, much cognitive work is 'delegated to manipulations of external media' (Clark and Chalmers, 1998 p8). When the mind is linked with an external entity (by entity our focus here is on digital devices and

the software applications accessed through them), there is a two-way interaction which creates a what Clark and Chalmers (1998) regards as a coupled system and this, they argue, creates a cognitive system in its own right. So long as the external resources are available when needed, they are coupled with the individual in a reliable manner. According to their thesis, digital devices (i.e. an external entity) govern behaviour and are just as much part of cognition as the brain itself, to the point that if the device is not accessible the behaviour (or practice) cannot be performed with the same level of competence. To return to the earlier example, if my mobile phone battery has died, I cannot call a particular person because I do not know the telephone number as a result of having come to rely heavily on the phone. In the marketplace, apps are sold on this very basis. For instance, *Evernote* is marketed as an app to 'organise your life's work' (Evernote, 2015), it saves everything you need to do, buy and remember, across your devices. The app does everything for you, but there needs to be a successful, reliable pairing between app and user for the cognitive system to work effectively. That is, the app needs to be there and work when required, such that it becomes 'part of the basic package of cognitive resources' that one uses in everyday life (Clark and Chalmers, 1998 p11) – the phone and its apps that are used and relied upon is an extension of the mind. What may seem like action based tasks, such as using a pen and paper to help with long division or rearranging scrabble tiles on a tray or accessing an app via a smartphone are, from this perspective, regarded as part of cognition rather than action (Clark and Chalmers, 1998). In terms of consumption based contexts, we can see how desiring practices are delegated to digital devices, for instance when saving objects in an online wishlist, one no longer needs to remember or think about what they desire as it is safely stored for them (Denegri-Knott and Molesworth, 2013). Ideas for what to purchase are provided by website recommendations based on previous browsing and purchase behaviour. Likewise, inspiration for how to

decorate, or what to cook or sew is provided via desirable images that have been stored and shared on platforms such as *Pinterest.*

What becomes apparent, is that not only does an app or device need to be readily available, but the user needs to develop particular skills, knowledge and competence in using it (and in the case of *Evernote*, across a variety of devices) to allow for effective pairing to occur. Accessing the app or entity is not enough, when it comes to digital devices and software we note a shift in focus where the individual must also become a competent user of technology. Indeed, paired, or coupled systems are regarded as fragile, as such they can easily become uncoupled (Clark and Chalmers, 1998).

We want to consider how digital devices and their software applications become part of the package of cognitive resources in relation to consumption practices and the implications of this for consumers and consumer practices. In the following sections we focus on particular ways in which digital devices/software applications extend the mind, in terms of knowledge related to particular practices and their role in relation to imagination and memory. In particular we focus on the level of commitment in practice and consider the issues arising in terms of a shift from practice/consumption to becoming a competent and committed user of the technology itself.

METHODS

We draw on data from a large, on-going study of digital virtual consumption undertaken with avid digital technology users living in the South of England. The most recent study was of 29 enthusiastic home cooks who use digital devices in the practice of cooking, conducted in 2014/15. The second was a study of 20 wish-list users, undertaken by student research assistants in 2012, which considers the role of software-based shopping aids such as Amazon wish lists, Ebay auction watch lists and Google shopping lists in terms of how these website

functions interact with the imagination and subsequent consumer desire and actualisation. The third was a study of 40 avid eBay users, conducted between 2008 and 2010. All participants were self-selected and recruited through personal referrals.

All interviews adopted a phenomenological perspective. We gained a highly contextualised description of consumers' life worlds and lived experiences with digital devices by concentrating our data collection and interpretation on these experiences and meanings consumers attributed to them (Creswell 2007, Goulding 2005, Thompson et al.1989). The key aim of our approach was to narrate a contextualised account of consumers' experience and usage of digital devices (Burawoy, 1991; Strauss & Corbin, 1998). The ultimate aim was to appraise how digital devices were integrated into everyday practices that relied on consumption activity (meal preparation) or was focused on consumption itself (management of wishlists, use of eBay). Following interpretive research conventions, the sample for each study was relatively small since the aim was to attain variation in experiences (Creswell, 2007; Thompson *et al.,* 1989) not to attain a statistically representative sample or produce generalisable theory.

Most of the interviews were held at respondents' homes, with a handful-taking place in coffee shops and on our university campus. The in-home context was useful as it gave insight into the broader ecology of digital devices, material objects and people implicated in practices narrated by our respondents. Throughout the interview process, all informants had access to a digital device. This was important, as it allowed participants to refer to recent and more distant experiences as well as to show interviewers processes followed. We asked grand tour questions (McCracken, 1988) to generate biographical data and a broader understanding of the context in which experiences with digital devices took place.

On average, interviews lasted approximately 70 minutes, with individual interviews ranging from one hour to three hours in length. In total approximately 100 hours of data was

recorded. Each interview was transcribed verbatim and read carefully and repeatedly by an interpretative group of researchers to develop theory. Data interpretation took place by way of a hermeneutical circle involving a part-to-whole reading, made up of individual interpretation of interviews at an ideographic level and cross-case analysis (Thompson et al. 1989). Descriptive accounts of these experiences were derived from this exercise. This was followed by syntheses via which global themes were articulated and built upon for theoretical elaboration (Goulding, 2005; Spiggle, 1994).

A series of steps were taken not to compromise the authenticity and trustworthiness of interpretations (Thompson et al., 1989; Thompson and Haytko, 1997; Hogg and MacLaran, 2008). Researchers contributing to this project formed an interpretative group responsible for the data interpretation, which facilitated the bracketing process, thus limiting overt biases in the data interpretation (Hogg and MacLaran, 2008). During the interview process participants were asked if experiences captured were accurate and they were given the opportunity to read the finished work and provide commentary. Email exchanges followed interview sessions with some respondents with whom we continued to discuss emergent themes, and this helped us in re-thinking and fine-tuning interpretations.

FINDINGS

In the following section we consider three specific ways in which digital devices, and the software applications accessed through them, extend the mind when it comes to consumption and consumer practices – knowledge, imagination, and memory. A productive way to better understand such a relationship is to approach both consumers and devices as part of a cognitive system where consumers' cognitive abilities are extended. Furthering practice-orientated studies in consumer research (Warde, 2005), we draw attention to how the cognitive or knowledge-based elements in practices – general understandings, explicit rules

and principles and level of commitment (Schatzki, 1996) – are redistributed in consumer-digital-device cognitive systems. Where other studies have shown teleo-affective structures and level of commitment as having a driving force in how practices are carried out (Shatzki 1996, Watson and Shove, 2008) here we show how non-human agents in practice (like a digital device), have a role in moderating the level of commitment. In effect we show how digital devices are experienced as absorbing consumers' commitment to carrying out practices - in particular with respect to the acquisition and storage of know-how in practice. We conclude that in addition to the redistribution of skill and competence in human-tool hybrids in practice already identified in the literature (Watson and Shove, 2008; Hand and Shove, 2007), commitment too is redistributed.

In concluding, we discuss the consequences of the integration of digital devices in practice and consumption and consider how new practices are required and developed in terms of the individual becoming a competent user of digital devices and associated software applications, such that the use of digital devices becomes a practice in and of itself requiring its own set of skills, competence, knowledge and commitment. Finally we consider this as a refocusing of desire, from desire for goods or desire to be a competent practitioner to a desire for being a competent user of digital devices and applications.

Extended Knowledge

Digital devices are both epistemic objects of consumption and mind extensions. As knowledge projects for consumers they make accessible knowledge that is ontologically liquid, meaning that it is in state of flux and ill defined, and thus inciting consumers to initiate acts of discovery (Knorr Cetina, 2001; Zwick and Dholakia, 2006). As mind extending devices, they appear to both absorb and extend some of the cognitive work implicated in

practice. For example, many of our home cooks reported that they had substantially expanded the repertoire of meals they now cooked on an everyday basis as well as how they had increased the complexity of the meal projects they took on as a result of integrating digital devices in the practice of cooking. Katherine, who lives with her boyfriend and does most of the cooking in the household described herself as an adventurous cook. She told us that a weekly vegetable box delivery often provided new exciting ingredients that required her to research ways of using them, locating new recipes online and experimenting. Home cooks would also use their devices to find out about certain ingredients, to find out what to substitute for an ingredient and to help with more technical aspects of food projects. Self-professed 'cowboy cook' Rosanna, explained how she had dabbled with infused oils in the past, but locating online resources meant she could do it 'properly', this resulted in great success – making flavoured oils that were balanced and would last – including how to sterilise the bottle, quantities of ingredients and preserving the final product. Knowledge is extended because digital devices and their extensive applications provide more resources to make use of, thereby enhancing cognitive ability and the practice itself, such that they become just as much part of the cognitive process as the brain itself (Clark and Chalmers, 1998).

Digital devices also offer help with specific knowledges and skills that our home cooks were lacking. For instance, one participant told us about how *YouTube* provided her with the means to de-shell scallops:

> '*He brings me fresh scallops and I didn't know how to open them or what to do with them so watched some videos on Youtube showing me how they are going and how they open them. You know, just getting some thinking from it*' (Gina, 35).

Here the digital platform enables Gina to gain knowledge but also learn a new skill and enhance her kitchen repertoire.

Our participants often retold the time spent trying to find a useful instructional video, or accurate information on how to spot fake merchandise, as enjoyable. Andy, an engineer we interviewed alongside his wife, lived in a large bungalow in the countryside. He had a keen interest in tractors, and refurbishing motorhomes and had spent many hours 'figuring out the value of these things' and 'how best to renovate them'. Alongside specialist magazines and visit to dealerships, Andy and his wife had learned much about motorhomes by monitoring eBay listings. Even in situations when they were unsuccessful with their biding, Andy told us that he thought he had made progress because he:

> *'Was still building up my own knowledge about what was good and what was bad. So it was like, well, it looks good and I think I'd be happy with it but I'm not sure so the bid was still low. But then as I started to build up my experience of what was good and what was bad and what we needed as well… We realised very quickly that there are very few motor homes that look the same, there is no standard unit, every one of them is completely different. So just going and thinking, yes, I want the bed here or I want the kitchen there and we'd have to fold that out and put it back, and all of that stuff, we just realised there is so much out there.'*

Andy and his wife soon realised that that there was no standard unit and that aspects like kitchen placement and multifunctional furniture were important. In building a better understanding of what was needed in order to complete a project (refurbishing a motorhome, cooking or completing a collection), we noted how commitment to carrying out a practice, also meant commitment to becoming more skilled at 'extending their mind'. In effect the alignment of consumer and device in consumer-digital device cognitive systems is maintained by the object-orientated practices linking consumers to their devices. To borrow from Knorr Certina (2001) it is because as epistemic objects, digital devices offer partial glimpses that imply what is missing and 'suggest which ways to look further through the

insufficiencies they display'. Doing this is, as previous studies on epistemic objects indicate, an affectively charged affair, because it produces an intense desire to explore (Knorr Certina, 2001; Zwick and Dholalia, 2006).

Andy and other participants like Malcolm, who collected luxury watches, become more knowledgeable about the product categories they were interested in. Effort and time expended in doing so often meant that the search for knowledge eclipsed or at least competed with our participants' commitment to completing practice related goals (cooking a meal, completing a collection). Take Ashley for example, who was collecting figurines on behalf of his future mother-in-law and in the process became very skilled at finding rare items at bargain prices. We interviewed him in a dining room that housed an impressive collection of up to 500 Camberwick Green figures that were neatly displayed in two cabinets. He told us how much he enjoyed researching ways to find figurines at bargain prices:

> *"I found this American website, this sounds so sad and anorak-y. I found this American website, you'd put what you were searching for so like Camberwick Green. So you'd put Camberwick Green into this American search engine. It would then search the English eBay but it would search it for spelling mistakes because obviously with eBay whatever you type that's what it looks for. When you did this thing with this other website it was searching for maybe 500 variations of the words Camberwick Green.'*

He told us how he felt when '*finding them, especially if they were spelt wrong'*, and how he missed it '*because it was exciting and he was very good at it'*.

Extended Imagination

Inspiration for objects of desire is acknowledged as something that can be generated externally, for instance from the media, via observation of other people, through the internet and various platforms associated with it. Studies acknowledge the role of magazines (Belk, 2001; Stevens and MacLaran, 2005), catalogues (Clarke, 1998), window shopping, television and film (Belk, Ger and Askergaard, 2003) as resources inducing desire, stimulating the imagination and in turn, actual consumption. Our studies of digital virtual consumption, technology users and imagination indicate that digital devices and platforms take this further. They do not simply provide inspiration to intensify desire but extend the imagination by way of taking on some of the cognitive work that is required by the consumer in order to locate objects of desire, to fuel desire, and to find inspiration for a particular consumer practice. Beyond offering fodder for the imagination digital devices become consumer mind-extensions – becoming the default go-to device to find inspiration and fulfil desires, even doing some of the desiring work that was the domain of consumers, as they become human-digital-device hybrids.

For many of our participants their digital devices are seen as extensions of their imagination - extending their cognitive ability. For example, in our study of home cooks, digital devices provide ways to get ideas for what to cook, whether it is finding inspiration or fulfilling a pre-existing desire for a particular dish by deferring to digital devices. Many of the cooks told us that they look to digital devices for inspiration, specifically they used food based smartphone apps, *YouTube* channels and internet searches for recipes and meal ideas, often based on particular ingredients they had available or needed to use up, and then let the device determine what to cook. For instance, one keen cook described her own ideas for using up a butternut squash in a soup as *'quite boring'* and so delegated to *Google* to locate more interesting and inspiring dishes for the ingredient where she found a recipe for a curry instead.

The notion that the internet offers more exciting options was particularly salient when cooking for other people and wanting to showcase cooking skills. For example, new food blogger Sophie who recently moved in with her boyfriend described her cookbooks as *'for us in the week'* because they have a number of chefs and recipes that they like and rely on, but when trying something new she defers to the internet, which offers more variety so she can weigh up her options:

> *I use the internet when I want to try something new that I thought of. So if I was looking for inspiration for something I wouldn't go to our cookbooks, I would go to the internet and just do a search and look at lots of different things. A lot of the time it will come down to how easy it is and what ingredients are in it and if I have got it already or if I have to make as special trip somewhere to go and get it. So I like to look at the options. I wouldn't say I go onto one website and that's it, unless it's a really amazing recipe. I do like to look at lots of different things.*

Beyond delegating to the internet to find greater inspiration, it is also apparent that certain platforms offer the user suggestions based on previous behaviour and searches. For instance, one participant told us about his use of *YouTube* videos, describing them as '*quite smart'* because of the suggestions they provided for him; '*every time I use Youtube I usually watch the videos Youtube have suggested to me* (Jim, 24). Jim doesn't have a particular ingredient or occasion in mind but gets inspiration from *YouTube* based on his use of the site's channels, thereby potentially providing even greater inspiration that is not constrained by any initial thought, food or other criteria.

In relation to looking for inspiration and igniting the imagination, it is evident that the universe of potential things to desire is experienced as significantly expanded and continuously unfolding. As noted previously, here digital devices as both epistemic objects of consumption and mind extending become knowledge projects for consumers, making knowledge accessible and inciting acts of discovery (Knorr Cetina, 2001; Zwick and

Dholakia, 2006). In being open ended and complex, digital devices and their associated software platforms mean there are always more or different things to be found and desired. Because the digital devices never stop signalling the possibility that new information, tutorials, or item images, are about to be found, this ignites cycles of revelation for consumers, and these cycles produce a sense that the mind is being extended. In consumer-digital device cognitive systems, the ability to imagine is redistributed in ways that, as we show in our examples below, are experienced by our participants as enhancing the amount of resources to feed into consumers' imagination but also consumers' skills to imagine.

Often the digital device is awarded agency in shaping what consumers want. Clarissa, one of our participants, reported feelings of intoxicated excitement upon discovering a multitude of sewing patterns she could find on eBay. When we interviewed Clarissa, she was living in a semi detached home with her children. She had purchased a bundle of sewing patterns and was in the midst of sorting them out on a kitchen table when we first arrived. She told us how she got carried away finding an incredible array of variety from international sellers that ensured there was always something new and different to look at. As Clarissa later told us, when she struggled to visualise what an Indian outfit looked like, eBay had 'shown her' what it looked like. The platform device did this by producing results to a search for Indian outfits, *"I found out by looking at Indian clothing, I could actually identify which outfit I was looking for"*. She later explains:

> *"I wasn't looking for saris, I was looking for this type of (peshawari) or whatever outfit. So then I can go back up and search on (peshawari) and then it brings up all these different outfits. There was just nothing that I thought 'that's really nice'. It was beautiful embroidery on polyester and I thought that just doesn't feel right"*.

Note in these narratives how Clarissa, Sophie and Jim experience their digital devices as enhancing their ability to see what a peshawari looks like and what meal to prepare by

creating clearly discernible and comparable choices that can be returned to. Choices are returned to, studied, evaluated and compared, such that the ability to imagine is enhanced, as a result of the time they have invested in searching online.

The redistribution of imagination in consumer-digital-device practices produced different states of commitment and affect. Some participants remarked on how, in awarding the device agency in looking and finding things to buy, their commitment to acquiring them had been reduced. One of our participants, reflecting on the contents of his *Amazon* wishlist, remarked on how over time, jeans, t-shirts and other items stored, had become 'boring to him'. Others like Ashley a young manager who had spent a year collecting figurines, had stopped his obsessive use of eBay searching through the listings. Instead, the search itself had been delegated to the device. He told us *"I set up these alerts on eBay for each of the codes of each piece. So eBay would then email me or send me a message when something was listed'.* This, Ashley told us, made it too easy, and too mechanical an operation to hold his interest over time. This distribution of agency within the consumer-digital-device cognitive system meant that only the device is entrusted a key role in finding new figurines to add to the collection, but also the fun associated, often highlighted in the literature on consumer desire and imagination (Belk et al. 2003; Campbell, 1987), with the search is cut short. This overtime seemed to reduce commitment to the object of consumption but also the practice of searching.

This example illustrates how digital devices begin to take on some of the work that was previously considered to be done by the consumer in relation to desiring practices (see Denegri-Knott and Molesworth, 2013). Less agency is required from the consumer because websites and software locate better objects or projects and make consumers desire more because they provide options the individual hadn't thought of. If we consider *Pinterest,* this platform constantly provides new things for users to desire – whether it is an object to

purchase, a style to recreate, a recipe to cook, or a craft to make. It becomes a repository for things one desires, but also provides continuous inspiration for more ideas, for more projects, for more things to desire. The individual no longer needs to keep a scrapbook of cuttings from various sources but can simply 'pin' things that are presented, such that it too does desiring and indeed remembering for us, efficiently storing ideas and objects that can be returned to (or not), which leads us now to consider the notion of extended memory.

Extended memory

When we refer to extended memory we acknowledge the role of digital devices in terms of the storage, safe-keeping and retrieval of things we desire – objects we want to own, or projects we want to complete. In consumer-digital-device cognitive system, consumers' ability to store and retrieve information, instructions, images, and tutorials was experienced as being extended. For active externalists (see Menary 2010; Clark and Chalmers, 1998) the external memory embedded in digital devices and consumers' internal memory, complement one another in carrying out cognitive tasks in practice. In this way digital devices are experienced as taking on some of the work previously carried out by other consumer-cognitive systems, like a consumer manually writing up a wishlist or referring to a cookbook. The operation of successful consumer-digital-device cognitive systems is reliant on information retrieved from the digital device being endorsed more or less automatically. This being the case, consumers must ensure that know-hows embedded in the digital device are easily accessible (Menary 2010; Clark and Chalmers, 1998) and this is reliant on easy retrieval of stored know-hows.

Participants talked about objects and recipes being safe once stored on a digital device. In relation to the practice of cooking, participants tended to bookmark recipes, create

folders to store recipes in, collect recipes on *Pinterest* and sometimes print them out to keep a hard copy in a folder. In relation to consumption objects, individuals added items to their online wishlist or shopping basket, where it would be kept for later consideration or purchase. By storing objects of desire or practice related content electronically or online, consumers use such devices as an extension of their memory – they are relieved of the need to remember for themselves. In terms of cooking, with the sheer volume of recipes available and used by our cooks, this was felt to be a necessary part of the practice, to the point that there was no desire to memorise recipes or even to memorise which website a preferred or successful recipe came from, instead we note a conscious delegation of memory to device. Adventurous cook Katherine, explained how she bookmarked recipes she particularly enjoys, and now has a '*huge long list under Food Folder'* that she has kept to go back to because *'I'm terrible really, I just won't remember kind of what I need to put in it or what I need to do, so as long as I have got it there I'm kind of safe and then I can add a few bits to it''* (Katherine, 35).

For some, more involved practices were engaged in. One participant, Paula, a self-taught cake decorator likes to take photos of her cake decorating projects, which she started when her daughter was small, to remember the projects she has achieved. Originally she started a hardcopy album for cakes that pre-date digital photography. She showed us how she now saves them to her *iPad* and has a *Dropbox* account created especially to back up and organise different folders related to her cooking, baking and cake decorating projects. Paula also describes how this was a solution to the problem of not remembering where she found certain recipes:

> *"when I created it, it links to my iphone, I keep recipes as well as photos on Dropbox. Where I've been finding recipes online I then couldn't find them so I started taking photographs of them and saving the photos and it's backed up to the Dropbox".*

Aspects of remembering are performed in conjunction with digital devices – the *iPhone, iPad*, laptop and apps like *Dropbox* – such that these have become a requisite part of the consumer-digital-device hybrid. They have become part of what Clark and Chalmers (1998) refer to as the cognitive resources that individuals bring to bear on their everyday life. This conscious delegation of memory to device changes the practice of cooking and consequently the specific things that individuals need to remember. No longer do we have to remember recipes, but where they are stored, how they are stored and be able to source them when required. For many, this was locating bookmarked webpages or recalling particular websites that certain recipes were on – this was one of the ways in which our home cooks extended their memory capability. Remembering or memory changes with the integration of digital devices and becomes about accessing stored information and using specific digital tools, rather than remembering content, details and specifics.

For consumption-orientated practices, like producing wishlists, our participants often spoke about their digital device as 'remembering' for them. Andy, the motorhome enthusiast felt that his engineering background conferred on him a disciplined approach to his eBaying. He described his use of eBay as fastidiously efficient. He kept all his past searches and items he had been monitoring – this for him was important, even if items had been sold because it gave him '*a bit of history*'.

> '*A lot of those have actually sold but it still gives me a bit of history. So if I see something else I could think, well, I'll definitely watch this and see what the thing's sold for. That helps me judge what I can sensibly bid for something else that comes up*'

Curiously he also felt comforted by the fact that he didn't have to think about items individually as they were stored in his 'My eBay' area. Over time, Andy felt that he had been

a little bit relaxed in carrying out his research and this ultimately ended in him purchasing a Smart car quiet impulsively.

In these examples we can see digital devices extending memory. We also observe less commitment to actively remembering know-hows in carrying out practices. The functions offered by the devices and platforms become extensions of one's mind, enhancing cognitive abilities, prompting memory, but we also observe a delegation of cognitive function to device here (Clark and Chalmers, 1998). The result of this is that the human agent is then freed up to engage in other activities – the burden of consumer desire or of commitment to practice is delegated to the device, only to be 'picked up' again by the brain when the consumer is free to do so. This seems to transform the teleo-afffective structure (Schatzki 1996) of desiring practices, making the affective component less salient, and altering the focus from end purposes to being more task or project orientated.

Consequences and implications for extended mind

Integration of digital devices/software applications change the nature of cognition required to engage in consumption practices. In extending knowledge, consumers need to know how to use devices, sites and apps. They do not need to retain this information necessarily, but know where to look for it and how to find it and this in itself requires specific skills and a commitment to extending the mind. At times, extending knowledge becomes more important that the practice or end goal and it is digital devices and their associated apps and platforms that enable this to be the case.

The extended imagination also relies on knowing where to look, what key words to use, how to navigate sites and platforms like *Pinterest, Google Images, YouTube*, and food

blogs. In helping consumers locate objects of desire, fuel desire and find inspiration, digital devices become the go-to device, relied upon because they produce more exciting options than one can imagine alone. In prompting and inspiring, digital devices extend imaginative skills providing ever more options and opportunities for desire and imagining. They can also ease the burden of desire as they take on some of the cognitive work previously carried out by consumers when they are awarded agency, which results in a reduction in commitment on behalf of the individual as imagining and desiring is redistributed to the digital device (Denegri-Knott and Molesworth, 2013).

The extended memory relies on specific ways of storing and retrieving. The nature of memory, or remembering, changes in that consumers do not need to remember content or information but how to access it. There is a clear redistribution of memory here as the external digital device takes on some of the work that the internal (human) memory used to do – as such, there is less commitment to actually remembering. Of course, the sheer volume of objects and projects available via digital devices potentially require this development in memory as the endless possibilities could not otherwise be effectively managed.

In extending knowledge, imagination and memory, it is evident that the use of digital devices becomes a practice in itself, requiring skill, competence and knowledge. Skills are required to manage and maintain wishlists, to set up and use auction sniping software effectively and to store countless recipes so that individuals do not need to think about objects of desire or future meal projects. This results in new practices being required and developed in order to become a competent user of digital devices and their associated platforms, as well as a commitment to these new practices. Moreover, we can notice a refocusing of desire here – a desire to master the use of apps, the desire to become a more competent wishlist user, ebayer or practitioner – the consumer-digital-device cognitive system needs to be worked at and maintained. It also broadens desire, for example, cooking

becomes not only about producing nice meals but learning new techniques, learning about new ingredients and impressing other people. The need to acquire and develop skills and competence to access content (to access the extended imagination, the extended memory or extended knowledge) when needed means technology introduces a broadening of what consumption practices may mean. There is also a redistribution of commitment when 'work' (imagining, remembering, knowing) is delegated to or distributed between human and non-human agents. Whereas a scrapbook may be a curation of the things one desires to remind, to obtain pleasure from, to fuel desire and to compensate (act as surrogate experience), digital devices and platforms invite us to curate and store more things than we might ever want or be able to actualise. Such platforms and devices act as a holding place for our desires, and a consequence of this is that the focus of desire shifts from the object to the platform, that is rather than simply desiring to be a better cook and searching for recipes and foods to make, we may locate other related artefacts, such as health and nutrition information such that *Pinterest,* for example, broadens what it means to cook. The practice is transformed as new cycles of discovery emerge (Knorr Certina, 2001).

Conclusions

We have explored particular ways in which the mind is extended via the integration of digital devices and their associated software applications in everyday consumer practices. Such integration changes the nature of cognition and consequently changes consumer behaviour (Clarke and Chalmers, 1998). There are, however, other aspects of extended mind that might usefully be considered in consumption studies regarding the role of external entities, which we have not been able to do here but see value in future research exploring.

First, given the fragile nature of consumer-digital-device cognitive systems (Clark and Chalmers, 1998), there is potential work to be done on the consequences of failed systems.

That is, what happens when internal (cognition) and external features (digital devices) are not effectively aligned, such as when the external features are not available or are removed? When a recipe is no longer available, when an object of desire is no longer for sale, or when a website or app cannot be accessed? This is particularly prevalent when we consider extended memory. Some of our cooking participants talked about bookmarking and making hard copies of digital recipes (saving, printing, writing down), indicating a potential fear of being without them, not being able to locate them, and not wanting to forget them. If the digital sources are not available, what happens to practices (skill, knowledge, competences)? What are the behavioural and indeed emotional implications for consumers? How do practices change or adapt as a result? What coping mechanisms do consumers have when such experiences occur? If, as Clarke and Chalmers (1998) state, we have come to rely on external entities so heavily – to the point where the brain may even have evolved as a result – how do we cope when they are not available and the consumer-digital-device hybrid fails?

Second, Clarke and Chalmers (1998) also highlight the socially extended mind in terms of other people and our networks being part of an extended cognitive system. Social networking sites and apps that we have considered here as digitally based mind extensions might be usefully explored in terms of this. For instance, *YouTube, Pinterest*, blogs and reviews are all based on information or experiences that other people have provided and shared, which the individual makes sense of. These form part of 'socially extended cognition' – when other people (their beliefs, knowledge, experience) act as an external feature. Digital devices potentially open up a much larger socially extended cognition and understanding how consumers navigate, understand and make use of this could shed a new light on our understanding of social networks for consumption and consumer practices.

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