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Products of the Open Design Context

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Abstract

Open design is commonly seen to derive from the power of the Internet and its associated technologies to distribute the means of producing and reproducing data and content of all kinds – including product designs. Open design connects the generation and transmission of digital content to actual material production and physical embodiment – the making of tangible things. Open design therefore represents an opening-up of the means of production of our material culture – how we make things. This chapter considers products in the open design context more broadly, in relation to considerations of sustainability and practices of social and sustainable design. It takes a broad view of the term 'product'. Object-based designing is not necessarily the optimal way of addressing the 'wicked' problems we face as manifestations of the inherent unsustainability of our existing systems of production and consumption, and our current lifestyles and value systems. The open design context can be seen to extend beyond the current model of the creation of products via an expanded circle of participation, to include the expanded field of design represented by service design and social innovation. This chapter, therefore, considers not simply products *in* the open design context (in the form of new modes of doing product design) but also products *of* the open design context. It uses an expanded idea of *product* which includes any form of designed outcome, physical or non-physical, and an expanded idea of *openness* which goes beyond the internet- and digitally-enabled production of physical objects.

Keywords: open design, sustainable design, social design, products

Open (product) design

> Open design is commonly described as the development of physical products through the free sharing of information. As in the free and open source software movements before it, the internet facilitates the sharing of data, allowing other individuals to copy or evolve the original object.
>
> *– Ozorio de Almeida Meroz and Griffin, 2012, p406*

The above definition identifies several key characteristics of open design. It is commonly seen to derive from the power of the Internet and its associated technologies to distribute the means of producing and reproducing data and content of all kinds – including product designs. Open design connects the generation and transmission of digital content to actual material production and physical embodiment – the making of tangible things. Open design represents an opening-up of the means of production of our material culture – how we make things. We have become used to a sense of empowerment as consumers, although this may be largely illusory considering the degree of marketing and media penetration into almost every corner of our public and private lives. Via open design we are now becoming empowered as producers, able to not simply select our preferred product from those made available to

us in stores or catalogues, but to go some way in the creation and manufacture of our ideal product. Open product design is closely associated with open manufacture, whereby the subsequent production or making of an object is also delegated to the end user. This is delivered by, for example, local 3D printing, which replaces centralized large-scale industrial product manufacturing. In this way, custom products may be made on-demand by the people who will actually use them. This, in total, is the common model of the open design context, in which product design is no longer the exclusive domain of trained professional designers.

This chapter considers products in the open design context more broadly, in relation to considerations of sustainability and practices of social and sustainable design. It takes a broader view of the term 'product' than is contained in the model of open design given above. An object-based notion of design, as evident in conventional product design, is often at odds with emergent modes of designing such as service design and social innovation. These modes of designing are interdisciplinary by default, and often generate a range of (we hope) integrated design outcomes which may be both material and immaterial, physical and virtual. In these often multi-modal contexts, product design can seem an archaic discipline if it is predicated on a traditional idea of a physical object as its sole or primary design outcome. Object-based designing is not necessarily the optimal way of addressing the 'wicked' problems we face as manifestations of the inherent unsustainability of our existing systems of production and consumption, and our current lifestyles and value systems (Buchanan, 1992). Product-as-solution is often an over-simplistic design strategy, and risks reducing the complexity of an embedded social problem (such as a disabling physical environment) to a solution which only deals with somewhat superficial surface symptoms (for example, medical aids to allow users to perform a currently difficult task). As von Busch (2012, p444) asserts, 'many new designs are bug fixes of old failures. New design *paradigms* seemingly take a leap in a different direction.'

The open design context can be seen to extend beyond the current model of the creation of products via an expanded circle of participation, to include the expanded field of design represented by service design and social innovation. This chapter, therefore, considers not simply products *in* the open design context (in the form of new modes of doing product design) but also products *of* the open design context. It uses an expanded idea of *product* which includes any form of designed outcome, physical or non-physical, and an expanded idea of *openness* which goes beyond the internet- and digitally-enabled production of physical objects.

The open design context

Open product design can be seen as a reaction to the increasingly closed or 'overlocked' design of the product systems presented to us by leading consumer brands such as Apple (von Busch, 2012, pp446–447). These products are physically impenetrable to their users; their much-vaunted ease-of-use (see any Apple advertising campaign) is not based on any user awareness of, or access to, their highly complex and unknowable ways of working. Modern consumer electronic products embody a clear disconnection between how a technology works, and how we use it. We can be an expert user of a smartphone without having any understanding whatsoever of how it delivers the functions with which we are so adept. Digital literacy does not extend to understanding anything about the device with which we interact to perform feats of manual dexterity and mental agility. These products are unintelligible to a large extent because they are inaccessible – we only ever experience their surfaces, and the virtual interfaces which sit on top of the physical operations of the hardware sealed inside their monochrome encasements. As electronics are increasingly added to products which were hitherto passive, mechanical or manually-operated, so we are increasingly locked-out from knowing how our

products work. The looming 'Internet of Things' will be constituted by a growing network of physical objects embedded with electronics, software, sensors and network connectivity, enabling them to collect and exchange data on our behalf but without our involvement or knowledge. Far from feeling empowered, we are at risk of becoming increasingly enslaved to our autonomous smart devices and the technological networks which support them.

Fairphone – 'ethical, open and built to last' (www.fairphone.com) – is an example of contemporary industrial product design informed by openness. Fairphone has a number of ambitions:

- Extend the smartphone's longevity, from influencing the lifespan to increasing reparability.
- Consider our true impact while involving all stakeholders in the creation of our products, from users and suppliers to factory workers.
- Create products that make our value chain efforts tangible, from using fairer materials to making transparent our design processes.
- Use the Fairphone hardware as an open platform and give developers the tools to own and create software for the Fairphone 2.
- Empower alternative operating system organizations that match our open standards.

(*Fairphone, undated a*)

Transparency of production is one form of openness, contrasting with the obscurity of the manufacture of many consumer products (how were they made, by whom and where?). The Fairphone is also designed for openness, as a means of involving users in its continued development: 'We're using open source methods to help us achieve our goals. This includes striving to make our operating system (OS) source code and development environment available for anyone to use, review, modify and improve' (Fairphone, undated b), Fairphone exhibits three types of openness, identified by Ozorio de Almeida Meroz and Griffin (2012, p408): 'open access, open content and open hardware'. The design and production of the Fairphone is conventional in most respects – with the exception of the increased attention paid to social ethics and environmental sustainability (and the openness and transparency about both), and to some extent modular design (allowing users to modify and repair their handsets as required). Openness in terms of active involvement by users relates primarily to the continuing development of the operating system. This is not open design in the sense of the definition given at the beginning of this chapter, yet represents an interesting approach to increasing product longevity by involving users in the refinement of how a product such as a smartphone works at the level of operating software. The Fairphone is presented by its manufacturer as a more ethical and considered smartphone, which is delivered via, and evident in, an increased degree of openness when compared to any of its competitors. It is not a radical departure from the existing smartphone archetype, however. In comparison with the upgradeable phone concept of Stuart Walker,[1] in which the separated components of a phone must be reassembled each time we seek to make a call or use it in some other way, the Fairphone might be considered an example of ecomodernism in that it makes little significant challenge to the existing design language and typology of the phone itself. The Fairphone is also produced in the same factory as other phones, albeit with greater respect for the workers. It is designed with repair and upgradeability in mind, yet the potential for extension of product life is unclear in the case of a product of such fast-paced technological change. In this regard, Walker's phone-in-pieces concept is more open than the Fairphone, and due to the high level of required user engagement, perhaps more likely to attain increased longevity. The upgradeable phone concept embodies the principle that a product is simply a temporary configuration of components and materials. The easier it is to disconnect these and separate

them out from the product, the greater the prospect of their continued use beyond the useful life of the product that they constitute. This is an interpretation of open product design which directly serves environmental sustainability, in which a product is considered as a manifestation of an assembly of materials which could easily be used differently. Walker's concept suggests a design strategy which allows the product user to decide when and how to define a product, from elements which are, to some extent, open in their potential configuration.

Open product design represents a form of resistance to the enclosure of technology and the ways in which it is mediated to consumers by corporate bodies focussed primarily on financial profit. In an open design model, a passive consumer is upgraded to an active 'prosumer' who helps to define the functionality and benefits they want, and is perhaps also involved in the creation of an appropriately designed product. This participation is facilitated by the meta-platform that is the internet: 'Open design has emerged as a topic generated by a new logic of thinking: the internet with its rhizomatic creative networks and open software' (von Busch, 2012, p443). The top-down hierarchy of conventional systems of production, whereby products are delivered to consumers as packaged and sealed *fait accompli*, is subverted by a more horizontal structure in which a linear value chain is replaced by a network of actors who together constitute a system of interconnecting nodes, all of which can potentially have influence on each other. The common presumption is that this is all for the better and greater levels of design participation will yield more successfully designed outcomes.

This same ethos of transparency and open participation informs similar recent shifts in other cultural and political domains. As we seemingly enter the era of 'open everything', design can have a role not just in the creation of better products, but in forming the new design context itself. As Otto von Busch tells us in his sceptical consideration of the implications of this new model of dispersed, but perhaps unrewarded, creative labour: 'the open environment proposed by the ideology is still very much under construction, or perhaps in constant reconstruction, in a state of non-linear emergence … a larger societal project being built from the open ideology' (von Busch, 2012, p448). Open product design should therefore be considered within an open design context, or system, which goes beyond how we seek to produce objects. This is the new design paradigm presented by design for social innovation and sustainability (DESIS), and most notably by Manzini (2015). In this emergent cultural mode, design is used to respond to wicked problems and shared social challenges by *diffuse design* (performed by everybody) and *expert design* (performed by those who have been trained as designers), ideally acting in concert. This interaction between expert and non-expert designers is based on new forms of collaboration which open-up design practice to involve everyone affected by, and with an interest in, a problem and its solution. A key characteristic of this new cooperative paradigm is that our interest in a problem, as users or consumers or audiences of design, moves from being passive to being active – we are empowered to co-design the preferred alternative reality that we would like to move towards.

The DESIS agenda unifies two other emergent design agendas – social design and sustainable design. Open design is often presented as a new paradigm which challenges existing conventional 'closed' design. If open design leads us to think of conventional design as 'closed' in comparison, so social design and sustainable design lead us to think of mainstream design as both non-social and non-sustainable, respectively. These two emergent design paradigms are considered here now as they relate to ideas of openness and product design.

Open social design

Social innovation is an emerging mode of practice which seeks to respond creatively to the so-called wicked problems which can seem immune to traditional policy-based approaches and interventions:

> Our interest is in innovations that are social both in their ends and in their means. Specifically, we define social innovations as new ideas (products, services and models) that simultaneously meet social needs and create new social relationships or collaborations. In other words, they are innovations that are both good for society and enhance society's capacity to act.
>
> *(Murray et al., 2010, p3)*

It is hard to distinguish social innovation from social design, in that both are socially-directed and essentially participatory:

> Although all designing can be understood as social, the term 'social design' highlights the concepts and activities enacted within participatory approaches to researching, generating and realising new ways to make change happen towards collective and social ends, rather than predominantly commercial objectives.
>
> *(Armstrong et al., 2014, p15)*

Social innovation may be a design-based practice (when it is done or led by trained or self-styled designers), or a design-related practice (when it is done by others who do not recognize what they do as design). Social innovation is essentially participatory and open in its practice and methods, being in large part defined by its commitment to co-creation and co-design. Social innovation is always open design, in this sense, this openness extending to the common ideal of sharing how it is done and what it produces: 'The methods for social innovation should be a common property, and should evolve through shared learning. Chances of it being successful will increase if we can share our experiences and quickly reflect on what works and what doesn't' (Murray *et al.*, 2010, p9).

Social innovation and social design are not always product-based, however, where product means object. Akin to service design, they often seek to reorganize existing social and material assets for the delivery of greater social value, rather than to add to or remake our material culture via the creation of new products. In this sense, service design can be viewed as the design of a series of touchpoints via which a service (banking, for example) is delivered to a user. Some of these touchpoints are of course likely to be tangible and afford physical interaction (an ATM, for example). The service itself is an intangible, abstract thing we experience via a series of potentially dissociated interactions and create mentally by constructing a mental model of how these interactions perform together to deliver a higher-level goal.

Social design/innovation often addresses behavioural challenges, such as schoolchildren spending their lunch money on fried chicken fast food takeaways at the end of the school day: cheap, quick and sociable, the chicken shop is now part of many schoolkids' lives. Jay Rayner wonders if anyone can wean our children off their favourite fast food' (Rayner, 2013). This phenomenon is part of a larger archetypal wicked problem – growing obesity and poor health in young people living in urban environments in the UK. Fried chicken is a very well-designed product, and the chicken shop is a very well-designed environment in which to make that product available to consumers – an example of extremely effective

design directed towards an specific end, albeit an undesirable one. Consumerist design is about giving people what they want, rather than what they perhaps need. What we want may not be very good for us, yet it is what we ask for, seek out and are willing to pay for. The challenge here is not simply to introduce good design where it is lacking – there is already a good deal of very effective, if misdirected, design in evidence in many problematic contexts. Rather, the challenge is to apply design in a way that modifies the current scenario towards a preferred alternative; in this case, 'to work within the current fast food culture to provide a healthy, cheap and tasty alternative to current fast food offerings in low income areas with the long-term aim of reducing the levels of youth obesity' (Stoll et al., 2015, p10). The designed response here was a pilot mobile food outlet serving healthy, affordable meals located near a popular chicken shop. Crucially, the meals offered were familiar and appetizing to the young people being lured away from their familiar fried chicken.

Design agency, Shift, describes what it does as 'product design for social change', and all of its outcomes as 'consumer products'. Stoll et al. (ibid., p1) introduce the healthy fast food project discussed here as embodying 'a new approach to improving the food environment'. This suggests a broader design approach than that of much conventional object-based design, which typically views the physical object as its primary outcome. The physical outcome in the healthy fast food project, the Box Chicken mobile outlet, is the means to the end of serving nutritious, tasty and convenient meals. The *project* outcome – heathier eating habits amongst a young local target audience – is delivered via a broad range of elements which come together in the Box Chicken service. The term 'product' is used by Shift to describe any consumer offering – products, tools, services and experiences. (Stanhope, 2011, p2) There is nothing inherently more open about Shift's product design process than we might expect from any well-executed design project. It is based on thorough and careful analysis of the relevant issues and user behaviours, but then proceeds in a manner recognisable to any product designer.

It is important to note that this is not co-design with the intended audience involved in designing their own outcome, with assistance from trained designers. Openness is more clearly identified as the core operating principle of the online collaborative innovation platform www.openideo.com.

> OpenIDEO brings together creative people from all corners of the globe to solve design problems (social design) for social good. The platform is unlike any other: it walks participants through the innovation process in three distinct phases; it encourages visual contributions; and, it features an automated feedback tool called the Design Quotient. The DQ rewards both the quality and quantity of an individual's contributions. All contributions are valued – even simply applauding the efforts of others.
>
> *(Hulme, 2011, p222)*

The OpenIDEO platform exploits internet-based technologies to foster remote and often non-real-time collaboration among people who would probably not otherwise have found one another:

> In recent years, emerging technologies – from digital video to social networks – have provided completely new means to collaborate. Establishing our own web-based community and hosting challenges online seemed a natural next step.
>
> *(Hulme, 2011, p222)*

As in the open product design model discussed above, this model of distributed collaboration to address social challenges could not exist without the Internet; at least not in this always-accessible, ultra-responsive form. (It is interesting to consider what a slower, old-tech version of this model would look like, and how workable it might be.) Openness is an ideological stance for OpenIDEO:

> OpenIDEO welcomes all creative thinkers. The seasoned designer and the aspiring designer, the dreamer and the analyst, the MBA and the social entrepreneur, the hacker and the strategist, the big ideas guy and the details-oriented girl, the active participant and the curious lurker. No matter what field you work in, what level of experience you have, what country you're from – if you're keen to collaborate on solutions to challenges facing the world today – you're welcome to join us. We've got creative thinkers from many disciplines outside of the design world in our community – from police officers to doctors to social entrepreneurs to high school students and beyond. We believe that diversity is a cornerstone of effective collaboration.
>
> *(OpenIDEO, 2014)*

The OpenIDEO design process has six phases, in response to published challenges: ideas; feedback; refinement; evaluation; top ideas; and, impact. The process takes several months to move collectively through these phases, representing selection, development and refinement of concepts in response to the published challenge. This process is open in its ethos and methods, with an OpenIDEO team visibly acting on the platform as facilitators of constructive collaboration. Critique of the contributions of others is carefully monitored to ensure that the inclusive spirit of the platform is maintained at all times (some users may find this lack of criticism over-polite, and to the detriment of the optimal development of ideas and concepts posted to the platform). OpenIDEO seemingly represents wide-open participation in its design process; there are limits, however. The most significant barrier to entry is that you must be online to access the platform. The language of OpenIDEO is English, which is widespread but not universal. Even if these two potential barriers are surmounted, participation on the platform probably requires a degree of conceptual familiarity with design as a structured, systematic process. Despite these challenges, OpenIDEO represents the most widely accessible (and therefore, open) example of design as *process*, rather than *outcome*: 'Openness should thus not only be sought in the final product, but rather in the space that is provided in the brainstorm/designing phase to make unexpected things occur' (van der Beek, 2012, p438). This is distinct from design systems, which appear open to user participation, but are actually highly constrained.

> Shopping at IKEA is a fun experience, where the consumer is pushed into creation, through a semi-open model. The website, for example, has the means for every consumer to design their own kitchen through the modular system. Although IKEA is only open within its own system and thus not modular at all, it does, however, give its consumers the feeling that they are the creators of their own home.
>
> *(Bouchez, 2012, p475)*

In this way, it can be seen that the 'feeling' of creation felt by a consumer whose actions are tightly scripted is not open design in a meaningful sense.

OpenIDEO represents an opening-up of designing which extends users' participation beyond consultation to actual generation of outcomes or solutions:

> Open ideology, especially in design, can also be seen as a continuation of the

> participative track in design, engaging users in the design process to such a degree that they will actually produce the objects themselves. 'Open' then becomes an essential part of co-creation and co-design, where the designer steps back from the drawing table and instead facilitates creative processes among users, rather than coming up with a finished solution.
>
> *(Von Busch, 2012, p451)*

The role of the 'expert' designer is then to develop the means (via a platform such as OpenIDEO, for example) for user participation in this expanded innovation process and, as in the case of OpenIDEO, facilitate the performance of 'diffuse' design (Manzini, 2015). This diffuse designing is not entirely open, however – it is constrained by the conditions set by the designers of the platforms being used. In order to ensure that the outcomes are viable and deliverable, the constraints and conditions for participatory design must be set for the users (van der Beek, 2012, p438). These restrictions may perhaps be adjusted to allow for differing degrees of openness and user determination of the outcomes, but the parameters need to be set by 'expert' designers.

This account of social design (social innovation) illustrates how conventional design might be considered non-social in comparison. Whilst all design has an intended user (this might be considered one defining requirement of design), the inherent openness of social design in being based on the direct participation of users distinguishes it from other modes of designing.

Open sustainable design

A second emergent design paradigm – and the most significant in its implications – is design for sustainability. There is growing evidence that we cannot be very hopeful of the long-term prospects for human flourishing, or even survival, on the Earth. The planetary impacts of the ongoing global Industrial Revolution (what we might reasonably now call the Anthropocene) are being detected and felt with increasing frequency and severity (IPPC, 2014). The design profession that has emerged to serve the unsupportable goals of this era of unsustainability, notably limitless growth, needs reinventing. Open design can be seen as the best response to the seemingly intractable challenge of embedded unsustainability – the ultimate higher-order wicked problem (Laitio, 2011, p192). If the unsustainability of our increasingly globalized system of industrial production and consumption is a manifestation of a closed, top-down worldview, concentrated in increasingly dominant corporate interests, then the bottom-up openness of the New Economy is seen as our best chance of responding (Thackara, 2015). Not all 'sustainable design' is open, in this sense. The eco-design practiced by manufacturers seeking to redirect themselves towards the goal of sustainability is rarely more than eco-modernism, designing for the market in the usual closed way, but with a green façade.

The socially responsive and ecologically aware drives in contemporary design (using Papanek's terms; Papanek, [1971]1984) are unified in the formulation of Design for Social Innovation and Sustainability (Manzini, 2014). DESIS pursues sustainability goals via the application of the ethos and methods of user-participation and co-design. In this regard, the DESIS principles are echoed in those of open design.

> Thus, where once methods of production were highly centralized in large, hierarchical corporations, this data-sharing coupled with new technologies proposes a new decentralized, grassroots, bottom-up production model.
>
> *(Ozorio de Almeida Meroz and Griffin, 2012, p407)*

The open design context, which is characterized by non-traditional interrelations between multiple actors, requires a particular way of doing design.

> The design process needs to be absolutely open to adapt to these a-signifying ruptures. There needs to be a context of continuous feedback and dialogue. A non-hierarchical, interdependent structure means that the designer really needs to stand next to the consumers and be available during the course of the process to jump in for new implications. This requires a new understanding of the role of the designer. The new strategic position of the designer is that of a nonstrategic continual awareness. Designing has become something which is never finished nor can it be done from a distance and has therefore to become ultimately dynamic and reflexive.
>
> *(Van der Beek, 2012, p434)*

This description of an open design process is very similar to the most familiar design process in social design, the Double Diamond, in which an open initial phase of problem exploration is followed by a point of problem definition, and then a phase of development of a proposed problem response (and perhaps, solution). The Double Diamond is characterized throughout by direct engagement with, and focus on, users and audiences; those on whose behalf we are addressing wicked social challenges. It often incorporates co-design as an ethos and method, as a direct attempt to include users in the designing of an appropriate outcome.

The synergy between open design and social/sustainable design is further evident in terms of what we should be designing for. Not only how, but also where, to direct our designing is one of the deepest questions faced by design and designers today. A shift to greater openness in design can serve the greater goal of challenging our current dominant cultural paradigm of unsustainability.

> Openness, in short, is more than a commercial and cultural issue. It's a matter of survival. Systemic challenges such as climate change, or resource depletion – these 'problems of moral bankruptcy' – cannot be solved using the same techniques that caused them in the first place. Open research, open governance and open design are preconditions for the continuous, collaborative, social mode of enquiry and action that are needed.
>
> *(Thackara, 2011, p44)*

Object-based design has been the driver of the consumerist model which we now recognize as being problematic, both in its immediate personal effects and wider long- term collective impacts. As we pursue prosperity without growth we need to decouple our notions of wellbeing and wealth from the production and consumption of goods. Non- object design, such as the design of services or new patterns of behaviour, represents the most likely route to achieving this. This is expressed in the idea of 'circuitry' as a design strategy for sustainability:

> The hybrid design fields that are emerging through the combination and fusion of environments, objects and services are becoming increasingly relevant. The focus is shifting from designing products intended for consumption to programming – or 'designing' – processes for networks of people, enterprises and organizations – processes which represent a pool of possible sustainable futures.
>
> *(Sikiaridi and Vogelaar, 2012, p483)*

These processes for networks to generate their own potential scenarios of sustainable living should probably be as inclusive and open as possible, to maximize their chances of being successful. The wisdom of crowds has long been understood, and can be exploited in 'wiki' design: 'The greatest potential in open design lies in building from incentives … open and peer-to-peer processes have a built-in drive to seek the most sustainable solution' (Laitio, 2011, p193).

We might replace the word 'incentives' here with 'needs'. Thackara (2015) provides a compendium of examples of how communities around the world are creating a new economy from the ground-up, rather than the top-down; we might see openness as an essential ingredient of such enterprises.

The challenges that have appeared on the online innovation platform OpenIDEO in its first five years represent examples of openness in design being directed towards goals of sustainability. The platform exists 'to pursue impact for social good around a variety of global issues' (openideo.com). We might therefore argue that it is inherently concerned with issues of sustainability. The questions posed by OpenIDEO present differing degrees of challenge and complexity: 'How might we establish better recycling habits at home?'; 'How can we manage e-waste and discarded electronics to safeguard human health and protect our environment?'; 'How might urban slum communities become more resilient to the effects of climate change?' The exploration of these questions via this online platform represents an example of 'open and peer-to-peer processes' identified above as being the most promising routes to viable and sustainable outcomes. If the barriers to truly open participation on such platforms can be removed their potential to move from designing for, to designing with, to designing by their intended audiences (those directly affected by and experiencing the challenges posed) will be increased (Suri, 2007).

Conclusion (open-ended)

This chapter initially considered the conventional understanding of open product design. It has argued that this is a limiting conception of the potential for increased openness in design. Just as sustainable product design could be seen as a limiting conception of the potential for increased sustainability in design. A consumer product may be unfairly victimized when it is literally the product of an unsustainable system of production, in which case, how could it be otherwise? Unsustainable consumption behaviour may, equally, be designed-into the object by that same system. What else can we do with a disposable razor or cheap biro pen, other than discard them via our flawed waste collection and recycling infrastructure, or make a clumsy and short-term attempt at reuse?

The best response to an apparently unsustainable product may not be a new alternative eco-product, which delivers the same function and benefit (we hope), whilst doing slightly less harm. Tweaky eco-design does not offer the giant strides towards sustainability that are needed. Rather than victimizing the product in isolation from the system that it is a product *of*, we should address the structural factors which effectively lock-in unsustainability to virtually all examples of product design – certainly those which are manufactured at any significant scale.

Open design is interesting, from a sustainability perspective, not simply because of its potential for innovation in product design, via bespoke or made-to-measure customization. It positions this pursuit of the perfect product in a new open system of design and production,

which opposes the mass-production model which leads to over-production and marketing-driven over-consumption of products. If we only make what we need, where and when we need it, we design-out much of the unsustainability embedded in conventional products derived from their over-supply and distribution. We do not, however, address the unsustainability which derives from the constant pursuit of novelty, the newest and the latest. Distributed manufacture and the capability to adapt a product design according to our every whim may actually feed that process, rather than hinder it. We may end up with even more stuff that we soon do not know what to do with.

The exploration of open design in this chapter has hinged on what we mean by the term 'product' and how far we are willing to go beyond object-based or product-as-solution designing and its inherent generation of more physical stuff. The current popular model of open product design addresses the means by which we produce objects, but is still premised on producing evermore objects. The volume of objects in the world could well proliferate if we all individually produce our own perfectly bespoke items, which may be too tailored to us to be of very much use to others. If we use the term *product* to describe any outcome of a design process – objects, tools, services, experiences – then the potential value of the emergent open design context to our pursuit of the goals of sustainability increases massively. The real value of open design to a collective pursuit of goals of sustainability therefore rests on how open we are in applying its principles. 'The long-term value of open design will depend on the questions it is asked to address.' (Thackara, 2011, p45) In this context, as in all others, we must continue to ask the most fundamental question of design: 'What, in other words, should open designers design?' (ibid.) A turn to openness is challenging to current dominant corporate interests, which are premised on principles of ownership, control and protection. Designers may be equally cautious of ceding ground to other participants in the performance of design. Who pays whom for what, in an open design context, is a question not easily resolved in a commercially driven paradigm. Yet it is a question that we must see beyond if we are to truly and effectively engage with open and sustainable design.

Note

1 See http://stuartwalker.org.uk/designs-1/14-evolving-objects-upgradable-phone-concept

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