

# ENDOGENOUS DESIGN AND ALTERNATIVE SITES FOR MANUFACTURING DIGITAL ARTIFACTS

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## ABSTRACT

As is becoming increasingly apparent, society faces the need to dramatically transition the ways in which we provision both our goods and our social needs. Headlines are filled with articles listing the debilitating societal effects of aspects of social media and the environmental costs of resourcing our consumerist lifestyles. Many proposals exist regarding the local commissioning, production, and consumption of objects in order to address these issues. However, there are limited examples of how this might be implemented regarding goods of a digital nature and the application of endogenous motivation on behalf of the consumer to encourage stronger forms of sustainability to emerge. To investigate this premise further, this paper proposes an opportunity that allows exploration of endogenous design in a protected niche environment, reviews alternate, emergent design approaches, and ideas of endogenous or intrinsic motivations and social practice. Finally, it outlines the potential of conducting this research.

## KEYWORDS

Transition Design, Sustainability, Endogenous, Digital, Social Innovation, Social Practice Theory.

## 1. BACKGROUND

Many scholars have written about problems associated with our current provisioning system for supplying us with consumer electronics (Dugger, 1996; Hickel, 2015; Jackson, 2005; Kallis, 2015; Max-Neef, 1992; Raworth, 2017; Schumacher, 1973). Others have also proposed methodologies and frameworks such as green manufacturing, sustainable manufacturing or circular economies to address these issues and to continue with “green growth”(Stopper et al., 2016). While changing our current manufacturing practices might very well mitigate some issues, these incremental improvements are not sufficient, and more significant measures are required.

Most current design practice is a process of detailing objects and services, making them relevant, desirable, and relatable to people. It is also intimately involved in the ways in which these products, services and systems are manufactured and produced. This point of intersection between both consumption and production, and demand side and supply side means there are opportunities in which design can have significant far-reaching effects. This indicates design can play a crucial role in helping society to transition to more sustainable patterns of production and consumption.

However, much of the design work undertaken today uses these skills in order to drive consumption in the pursuit of profit. Acknowledgment of sustainable, environmental, or societal issues tends to be leveraged in order to also further profit margins. As such, the outcomes from this process tend to result in further consumption and exacerbation of these issues. Boehnert (2014) suggests that design cannot fully engage with certain issues such as environmental degradation, climate change, resource depletion, or worker exploitation, as these values are in fundamental conflict with profit which is the central motivation of capitalism.

The design industry relies on profit as a feedback to establish value, but profits do not reflect ecological stability, resilience, equity, well-being, or happiness for the vast majority (Boehnert, 2014, p. 124)

In addition, Boehnert observes that design practiced under these skewed motivations creates substandard outcomes. These are then used in the justification of subsequent (substandard) outcomes from other design processes, leading to a reductive feedback loop that Boehnert calls the “reproduction of epistemological error by design”(Boehnert, 2014, p. 125). These precedents make subsequent attempts to address the issues mentioned above more difficult. Göransdotter (2020) also discusses similar aspects in which the notions of design practice

become limited by a sequence of designs reproducing past norms and values, each re-enforcing the next. The practice sets precedents at each step, regardless of them being good or bad examples.

In order to address the previously mentioned issues, designers need to be provided tools that allow them to significantly improve the likelihood that potentially far-reaching effects of their involvement are positive for the planet and all its inhabitants, rather than ‘de-futuring’ (Fry, 2009). Design and designers should be increasing their aspirations and ambitions and broadening their horizons, lifting their gaze from a preferred situation for the individual, to the level of community in which they live and the biosphere that enables their existence. This paper proposes an opportunity that allows exploration of endogenous design (Athavale, 2019) in a protected niche environment, reviews alternate, emergent design approaches and ideas of endogenous or intrinsic motivations and social practice and outlines the possible potential of conducting this research.

The paper is structured as follows. This background section now outlines various design approaches. Some such as Participatory Design are well established while others other such as Ontological Design are less known. However, all these approaches aim to broaden the possibilities of design and to use designers’ skill sets in more political or socially engaged roles. In section two these alternate approaches are discussed along with additional practices such as Social Practice Theory and Multi-Level Perspectives that could support the establishment of these alternate sites of production and their uptake. Concluding notes close the paper.

## **Alternate, emergent design approaches**

Numerous ways that design might be practiced have been proposed over the previous decades. Some have been proposed with sustainability directly in mind, others have been developed to tackle societal issues such as inequalities, under-representation, or exploitation. Some been proposed as a more generic or conceptual take on design. What follows is a very brief chronological list, noting the more significant approaches and a quick outline of their key points.

### **Design activism**

Design undertaken in order to achieve political or social change has had a considerable history which Faud-Luke links back to the beginning of the industrial age (Fuad-Luke, 2013).

### **Participatory design**

Participatory design regards the active involvement of users into the design process. This approach has a long tradition in Scandinavia (Bjerknes & Bratteteig, 1995) and seeks to accommodate varied ethical, social and political dimensions into the design process. It has been further expanded to include other stakeholders, such as those affected or in contact with the product or service. More recently it has been used as a facilitation method in which diverse or conflicting viewpoints might make headway in developing some alignment on ways to move forward.

### **Ontological design**

While Willis is not the first to discuss the ontology of design (Fry, 1994; Winograd & Flores, 1986), her paper in 2006 is a significant introduction of the concept to the design community (Willis, 2006). Ontological design observes that the effects of any design alter the way in which we respond, behave, and interact in the world. This is often stated as the maxim “what we design, designs us back”. The aspect of recursion plays an important role when we then discuss who designs what and for whom. Acknowledgement of this aspect can be found in Boehnert’s (2014) concern at the motivating factor of design performed in under a capitalist structure. Escobar states that because designed objects in turn design their users and societies in which they are implemented then it stands to reason that those societies should also have direct say on how those items are designed (Escobar, 2018a) He articulates this as Autonomous Design.

Thus, every tool or technology is ontological in the sense that, however humbly or minutely, it inaugurates a set of rituals, ways of doing, and modes of being (Escobar 1994). It contributes to shaping what it is to be human.(Escobar, 2018b, p. 110)

### **Redirected design**

Fry builds off the understanding of design as a recursive process and argues that we need to have a considered aim, and coordinated effort toward achieving that aim rather than simply our currently non-aligned, haphazard approach (Fry, 2007). Like Boehnert, Fry questions work done under the capitalist system but also asks questions about the suitability of design education in developing designers capable of redirection. He claims much of the output of current design practice is de-futuring in nature, involving actively working against conditions needed for (human and non-human) life to flourish.

## Social innovation

Social Innovation acts to prioritize the benefits and opportunities of a community, often by strengthening and amplifying the existing initiatives and active participation of various stakeholders. It emphasizes localness along with openness and connectivity (Manzini, 2008).

## Systems oriented design

Systems oriented design builds on Systems thinking and the fact that no one and nothing exists in isolation, everything is part of a wider system (Sevaldson, 2017). Therefore, the effects of designers and designed objects also affect the systems in which they exist. This makes it much more difficult to determine the outcomes of any design process. For this reason, the process needs to be undertaken with a rigorous examination and understanding of these systems.

## Transition design

Transition design, introduced by Irwin et al. (2015) aims to utilize design skills for dealing with unclear issues and put these to use in situations involving wicked problems, where the stakes are considerably higher than typical previous design projects, or issues where there are contestation and values at play (Irwin et al., 2015). Transition design proposes a framework of four aspects (visions for transitions, new ways of designing, theories of change and posture and mindset) that work together in order to assess situations and propose directions through the issues at hand. Transition designers work on the continuum of design from services and social innovation through to designing inside of alternate economies using social practice theory. The outputs of transition design are collaborative in nature with all the stakeholders involved or touched by the issue. These outputs are not fixed or final but can be seen as interventions that should be observed and tweaked as needed.

## Broader horizons

Each of these design approaches attempts to understand the larger context in which the results of the design process will be situated. They also try to perceive how the results of the design affect this context and what aspects might be modified in order to obtain holistic, beneficial outcomes. In contrast, design as practiced within the market economy tends to be less expansive in its outlook, often dealing with aspects of a product or service without considering the context of, relation to, or agency over other interlinked aspects. The results can be seen in the practice of user-centred design, where a focus on the personal needs or wants of the user are often prioritized over other issues such as community health and well-being, societal cohesion, environmental degradation, or worker exploitation. Designers that practice these emergent approaches are better able to understand the interlinked nature of many of these issues and how they might be tackled. These broader views also allow design more scope to directly tackle many of the issues we face today.

Emergent properties are designers' own new relational capacities that enable greater contextual understanding and new abilities to respond to complex levels of causality within networks and dynamic systems (Boehnert, 2014, p. 120).

This broader horizon also gives designers the opportunity to make significant contributions to societal transitions, rather than the incremental steps for individual consumers that tend to result from the majority of design as currently practiced.

Emergent cognitive capacities and perceptual practices (such as critical, reflective systems thinking) **potentially** have radical implications for the design of innovative, prosperous, and sustainable ways of living. (Boehnert, 2014, p. 123)

As Boehnert states, one reason design cannot fully address the issues we face is that it is typically conducted within our current capitalist framework. Emergent design approaches that could make significant advances on these issues do not yet create opportunities in which profit can be extracted in the same high-volume way as the application of user-centred design with its output of mass produced, high turnover goods and services. Therefore, these approaches are not employed.

There are a few options we might employ to address to increase the range of design approaches being employed. Short of the replacement of a capitalist ideology, the development of a design/consumer strategy aligning the values of profit and environment, such as Product-Service Systems (PSS) (Ceschin, 2014) might provide a start point. Additionally, emergent design approaches may be practiced outside of the current traditional economic framework. The advantage that this option is that it can be implemented now (rather than waiting for the replacement of significant systems) and that it can allow exploration to find other approaches and configurations that might be better suited to deal with our economic structure.

As Tonkinwise (2018) and others have pointed out, while the majority of the population live under some form of capitalist democracy, there are many activities that we often perform in our everyday lives that are not

included in the market economy. So, while our economic structuring is capitalist in nature, there is still a large proportion of everyday life that falls outside of that categorization. These activities bring us enjoyment: spending time with friends, colleagues, with relatives, working within our communities, volunteering, or practicing our own hobbies. They may also include activities more transactional in nature such as barter, under the table dealings, mate's-rates (or even unpaid) labour, housework, repair, or family care. A number of these are illustrated in the Diverse Economies Iceberg. (Gibson-Graham & Dombroski, 2020)

## **2. ENDOGENOUS DESIGN AND THE PRODUCTION OF DIGITAL ARTIFACTS**

These previously mentioned spaces and activities can provide opportunities in which to insert design interventions which are not profit driven but instead prioritise alternate social or ecological values. In addition, alternate economies exist that are Marxist, feminist, community driven or ecological in nature, some of which could be applied to these interventions. It is exactly these activities, and by extension, economies, that we should be seeking to amplify (Boehnert, 2018a).

Many of these activities are examples of endogenous satisfiers rather than pseudo satisfiers (Max-Neef, 1992). Endogenous satisfactions are derived from things such as a sense of achievement, sense of belonging, sense of understanding or learning and other intrinsic motivations. These satisfiers are more durable, more fulfilling, can build on previous activities, and are often amplified when shared with others. Endogenous design aligns with these intrinsic motivations to resolve issues rather than sell products or services. By contrast, pseudo satisfiers such as the purchase of items and goods in order to extrinsically fulfil our need for a sense of belonging or enjoyment are rather fleeting and shallow and are not often transferable. Focusing on these activities that provide endogenous satisfaction rather than typical patterns of consumption might allow for transitions to more sustainable lifestyles. As endogenous aspects, from which we already derive pleasure, tend to be more sustainable than consumerist practices and already occur outside of the market economy, it then follows that this is an opportune location in which to situate explorations to enhance, amplify and further link these practices with the aim of making them more resilient and sustainable.

### **Spaces for exploration and alternate sites of production**

Many approaches arguing for more sustainable lifestyles acknowledge the utility of a space where new approaches, concepts and networks can be trialled. These spaces include living labs, incubators, sandboxes, niches (Ceschin, 2014) and agnostic spaces (Hillgren et al., 2011). Working outside the mainstream economic system offers such a space. The benefits of developing and experimenting within these spaces includes the protection from markets forces, exposure to various actors and stakeholders and the identification of various impediments. Ceschin (2014) outlines three key characteristics that niches can provide. Firstly, acting as a lab, the space provides the possibilities to test the concept and to undergo "broadening" which links the concept to existing local initiatives in order to strengthen and amplify the network of projects and initiatives. Secondly, acting as a window, the space allows the concept to be promoted to help disseminate the idea. Thirdly, the space can act as a change agent, in which the presence of the experiment acts to change conditions to ease the adoption of the concept more broadly. A space, which contributes to a communities "everyday life" but exists outside of the economic structure, fulfils these aspects.

Additionally, as this space contains aspects that are not directly under the economic system, it contains a significant portion of our everyday lives. This also allows for the expansion of the space when alternate practices allow more portions of the day to be performed outside of the economic structure. This allows the clawing back of larger parts of everyday life from the profit extractions of capitalism. In addition, Multi-Level Perspective (MLP) (Geels & Rene' Kemp, 2007) shows ways in which innovations that are nurtured in the niche can break through into the dominant social technical structure. Typically, we see the reverse of this happening as more and more aspects of our lives are exploited for profit.

### **Design in support of endogenous results**

When we accept that the practice of design can be separated from profit driven enterprise and instead utilized to address the issues at hand, approaches such as Social Practice theory can be used. In contrast to the majority of design for sustainability projects that tackle individual users, an alternative approach is the adoption of Social Practice Theory (Kuijter & Bakker, 2015). Kuijter and Bakker call this practice-oriented (Kuijter & Bakker, 2015) rather than focused on individual users and their specific interactions with single objects. The adoption of Social Practice Theory allows a more holistic approach that acknowledges that objects are used in

the undertaking of certain practices that are not conducted in isolation. Acknowledging this larger social practice allows us to look at making some practices more prominent within society by targeting the three constituent parts which make up these practices: competence, meaning and materials (Shove et al., 2012, p. 14).

Social practice theory focuses on endogenous dynamics (Shove, 2010). Linked to this focus and its aims to change people's practices, it tends to implement "strong" forms of sustainability where the consumers adopt different behaviours, rather than simply choosing to purchase an incrementally more sustainable product (Lorek & Fuchs, 2005). Typically, a user-centred design approach attempts to implement weak forms of sustainability to influence individual users and their specific interactions with the object/artifact in question, in order to alter behaviour and thereby increase sustainability. However, attempting to alter individuals' behaviours in this manner can lead to claims of overbearing moralising from the role of the designer and assumptions of good and bad behaviour (Brynjarsdóttir et al., 2012). In addition, these marginal, incremental improvements in efficiency tend not to be significant and are often lost by larger trends (Kuijjer & Bakker, 2015). As many have observed and Manzini states, "it is not a question of doing what we already do better, but of doing different things in a completely different ways" (Manzini, 2009, p. 8).

Kuijjer and Bakker (Kuijjer & Bakker, 2015) also describe the need for an awareness of pluralistic worldviews and an understanding of the ontology of design work. This awareness of the possible connections between various social practices and their constituent parts allows for higher level shifts in social practice to be attempted, rather than by concentrating on individual interactions. Designers with knowledge of the interconnections might also be able to modify relevant aspects as the process unfolds, to improve the desired outcomes while reducing the negative. However, working on a level higher than individual objects requires co-ordination and collaboration between diverse actors and stakeholders and a deep understanding of the relations involved in the makeup of daily life. While Kuijjer and Bakker (2015) state this is not compatible with design as currently practiced, new roles for design become apparent in the adoption of this expanded practice.

Kuijjer and Baker (2015) observe that this approach is both more and less ambitious in regard to design. More ambitious in terms of a wider realm in which design can be utilized and the co-ordination and collaboration needed between the various interconnected aspects. But also more modest, as each individual interaction works together with others. These are some of the new ways in which design might be practiced as suggested by the Transition Design framework (Irwin et al., 2015). This approach removes the ethical issues of the designer deciding the moral attributes of certain behaviours. There is still shifting of societal norms but without the explicit judgements on individual behaviours. If these changes are successful they might help fulfil the "radical innovations" in consumption systems that Ceschin (2014, p. 1) calls for.

A number of authors have stated that the method of working outside of the current market economy is a very privileged form of design work (Boehnert, 2018b; White, 2020). Many in the design industry are currently already exploited as interns or working on substandard pay or with no or precarious contracts. These concerns are acknowledged and understood through personal experience, however, this limitation should not be used to further restrict the opportunities to attempt the advancement of design in transition society to more sustainable lifestyles. Maldonado speaks of the need that a designer has to experience autonomy in order to practice freely, and the difficulty in obtaining that freedom. However he also argued that designers need to act regardless of the current conditions. (Maldonado, 1972)

White (2020) and others claim that the method of local-community-driven initiatives such as those presented here are too small in scale to tackle the enormous problems we face. This claim fails to acknowledge that this process will also require top-down regulation, as would other design approaches. In both scenarios, a *hybrid process* (Manzini, 2014) with a top-down approach including some form of regulation is needed in order to enact the transitions, while bottom-up initiatives fill gaps that may occur by these actions. However, the identification of a public or community who are in alignment with these regulations would show an appetite for such implementations and could make these regulations more likely.

Finally, Escobar's discussions on the ontological nature of design and Suchman's writings on "located accountability" (2002, p. 96) point toward the importance of the undertaking and the implementation of design from within a community itself. This form of implementation is often in contrast to ideas proposed in the concepts of "Smart Cities", generic externally designed and remotely implemented top-down functionalised concepts, supplied to city administrators by multinationals with no accountability to local citizens and no accounting for local idiosyncrasies. Greenfield proposes an alternate approach aligned with Escobar's and Suchman's views, with multiple connected variants enacted from grassroots activism, that evolve organically in collaborations and consultation with citizens: variants that are open and amplify each other in order to strengthen the collective, which is itself "not merely subversive for the sake of being so, but offers a genuinely fruitful alternative to the intellectually bankrupt vision of the smart city" (Greenfield, 2017, p. 18). Concepts developed in one of Ceschin's niche spaces would be capable of fulfilling this vision.

Within these broader visions of how design might be practiced to confront critical issues directly, exist a range of potential interventions. The exponential effect of these interventions taking place at societal levels that

allow more consistency and coherency between consumption, fulfillment and lived experience seem to be extremely rich grounds to research new ways of transitioning to more sustainable ways of living.

### 3. CONCLUSION

There is a need for a space outside of the current market economy in which ideas for local communities can be explored, in which local actors and stakeholders can develop initiatives with different values and priorities at the heart, ones that more understand the networked world which we inhabit. Working inside of the everyday activities of citizens may provide this space, along with the connections and context to make the outcomes authentic, relatable, desirable, and empowering. There are multiple approaches from design, manufacturing, alternate economics, and social sciences that can (or need) to work in such spaces with alternate sets of values to that of the current markets. Additionally, these need to be contemporary in consideration and inclusion of digital natures of connection (both between people and place). These ideas of alternate priorities, embedded, accountable localness and connectivity seem to offer a rich potential of dynamic, empowering new practices worth exploring.

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