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A framework for the integration of the conviviality concept in the design process

Iban Lizarralde [a, *], Benjamin Tyl [b]

[a] ESTIA Recherche, Technopole Izarbel, 64210 Bidart, France
[b] APESA, Technopole Izarbel, 64210 Bidart, France

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ABSTRACT

Although the impact of technology on society has been widely studied in the literature, few studies have proposed a practical approach directly engaging stakeholders, including designers and engineers, in the development of new products and services. Within the degrowth movement, some approaches criticizing the western model of development suggest original criteria that could be integrated in the design process.

The current study seeks to analyze the conviviality concept of Ivan Illich (1973) to develop a new framework for designers. To that end, current design literature and four industrial case studies were analyzed according to the five main threats to conviviality: the biological degradation of the ecosystem, radical monopoly, over-programming, polarization, and obsolescence. As a result, this paper proposes a framework that includes two guidelines: one for product scope and another for the socio-technical system scope. The guidelines are composed of a set of recommendations that emerge from the relationship between the threats to conviviality and life cycle stages of a product or service.

These recommendations allow designers and engineers to better approach the complexity of the design process and co-create a strong sustainable society with stakeholders.

1. Introduction

Sustainability aims to meet the needs of an organization's stakeholders without compromising its ability to meet the needs of future stakeholders, such as companies, citizens, and social organizations (Colvin et al., 2014). To achieve this goal, it is necessary to reduce the current consumption levels and overcome an economy of growth.

A future degrowth society will require the development of new products, services, or uses within the framework of an eco-innovation process, integrating environmental and societal approaches. One major determinant of eco-innovation is technology, providing stakeholders with new cleaner production processes and new green materials, in addition to making information available to manage sustainable uses and behavior. Therefore, the eco-innovation process often consists of integrating such new technologies in industrial systems in order to design new eco-innovative products and services with lower environmental and societal impacts.

Nowadays, systems are complex and composed of various interconnected elements from economic, social, and environmental fields. Technology cannot be considered sustainable by itself, but must be considered an element of "sustainable socio-technical systems" (Gaziulusoy et al., 2013). To contribute to a sustainable and degrowth society, one must consider the whole system. New technological developments must not be disconnected from the whole system but must consider the added value as well as the undesired side-effects that the final product or service will provide to the society.

Because of its multi-dimensional aspect (Flipo, 2007; Demaria et al., 2013), degrowth is a relevant approach to considering technology as one element in a complex system. Degrowth relates to downscaling production and consumption, with the aims of reducing ecological impacts and improving human well-being (Schneider et al., 2010). Between production and consumption are products and services and the way products and services are designed and used (Spangenberg et al., 2010). Therefore, in line with Latouche (2004), one major issue for designers is the process of designing and selecting "technical innovations". Designers

* Corresponding author.
E-mail address: i.lizarralde@estia.fr (I. Lizarralde).

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translate technological innovations into fashionable consumer goods (Fuad-Luke, 2005). They are core stakeholders, deeply implicated in mass production, generating negative social or environmental impacts. They participate in a "junk production" process, which is to say, a trivialization of innovation dealing with technological artifice, fashion, and denial of needs (Ariès, 2007).

This is why the contribution of design is required to achieve sustainability in terms of production and consumption (Spangenberg et al., 2010). According to Shove (2003), what is normal and ordinary, especially the routine behaviors of users, has greater importance in building a sustainable system than extraordinary objects and new technologies introduced in the market. Through appropriate choice and implementation of new technologies in products during the production process, design can widely influence consumers and users.

Although the impact of technology on society is a strong topic in literature related to degrowth (Schumacher, 1973; Ellul, 1977; Illich, 1973), the key role of engineers and designers is underappreciated and neglected within the degrowth debate. Consequently, research conducted to date does not provide practical insights into how technologies can be considered in the design process with a degrowth perspective. The conviviality approach is a promising way to rethink the way designers and engineers design products, services, and associated technologies. Illich used the term "conviviality" to "designate the opposite of industrial productivity" (Illich, 1973, p17). In particular, Illich's alternative to current design is design that focuses on social solidarity, based on friendship and mutual giving, but is also "creatively accepting" its limits (Mitcham, 2003, p29). Therefore, an innovative perspective for designers is not to imagine how to produce and consume less, but rather to innovate on new productive models to overcome capitalist models (Kostakis et al., 2015). In line with this perspective, Popplow and Dobler (2015) recently discussed the "Design for degrowth", which is concerned less with consumption and more with reproduction, reduction, and relationships. In other words, such design is focused on a reduction of material goods and on an increase of relationship between actors.

Through case studies on companies related to bicycles, the current study questions technology from a design process perspective. As a result, this paper proposes to investigate the benefits of integrating conviviality thinking into the design process of new products and services, in order to enrich current design practices. The resulting guidelines will favor the dissemination of convivial products and services in routine practices.

This paper is divided as follows: Section 2 describes the five areas that Illich (1973) characterized as the main threats to conviviality. A literature review was carried out for each of the five areas, merging Illich's vision with theoretical concepts and insights from the eco-design literature. Section 3 presents the epistemological position of the authors and the research method followed in the current paper. Section 4 analyzes four industrial cases and describes the conviviality requirements for the design process. Finally, based on the literature review and the findings from the case study analysis, Section 5 introduces a design guideline to integrate conviviality in design process.

2. Theoretical background: an analysis of current design tools and methods through a conviviality framework

Various design tools and methods have been developed to help designers meet sustainability targets (Birch et al., 2012). Although there are no real tools or methods that directly deal with the conviviality concept, the following literature review summarizes a list of approaches and methods that partially integrate elements of conviviality.

2.1. The five threats to conviviality

Conviviality is about living in accordance with a system that satisfies human needs through the contributions of autonomous individuals, rather than with the principles of industrial society (Illich, 1973). According to Illich, society is faced with multiple limits and a natural scale beyond which tools[1] do not serve individuals, but rather serve an unstable industrial system.

Between an under- and an over-industrialized civilization, Illich defines the characteristics of a society of technological maturity. While an under-industrialized society invites the enslavement of man by man, the over-industrialized society enslaves people by its tools (Illich, 1974a).

Therefore, Illich (1973) characterizes six main threats of the overgrowth of tools, which are beyond the boundaries of and incompatible with a sustainable society: (1) biological degradation, (2) radical monopoly, (3) over-programming, (4) polarization, (5) obsolescence, and (6) frustration caused by realization of several of the threats simultaneously.

In the next subsection, the first five threats are analyzed. The sixth threat, related to frustration, is not considered, as it is not an empirical criterion. The connections of the first five threats with existing design tools and approaches are discussed. Some of these approaches warn about these threats, others propose solutions to re-establish the balance disturbed by these threats and finally, some enhance certain of these threats.

2.1.1. Counteracting the biological degradation threat in the design process

The degradation of the ecosystem is a well-known threat in the literature, therefore many design tools have been developed to avoid this threat. These tools primarily come from the eco-design and eco-innovation community. Briefly, these tools are based on life cycle thinking, which considers the products or services throughout their entire life cycle (extraction of raw materials, manufacturing, distribution, usage, and end-of-life), and multi-criteria thinking, which considers the complexity of the environment through different environmental impacts (ISO 14062, 2002). These tools allow designers to significantly reduce the ecological footprint of products, limiting the risk of environmental impact transfer. Other tools, such as the Consequential Life Cycle Assessment (CLCA) go beyond integrating economic notions in the environmental assessment of products and services, and reveal "valuable information regarding rebound effects" (Earles and Halog, 2011, p448).

Specific tools focus on a more innovative approach to sustainable design (Fussler and James, 1996; Tyl et al., 2014), which explores new ways to design radical products and services with the potential of reducing their environmental impacts.

Some recent approaches highlight the integration of stakeholder views into the front end of the eco-innovation process (Tyl et al., 2015b). For example, Bocken et al. (2013) proposed a tool to help designers consider the value captured by different stakeholders in social, environmental, and economic spheres.

In a strong sustainability approach, Bocken and Short (2016) identified new sustainable business models which reduce consumption and which are based on the notion of sufficiency,

[1] Please note that in this study, we distinguish between two types of "tools":

- "Tools" from Illich's perspective, i.e., a means of production or offering services, including public services, health, education, transport, etc.
- "Design tools", i.e., hardware and software for supporting design, based on a design approach, method, or set of guidelines (Blessing and Chakrabarti, 2009).

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