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diid  
disegno industriale · industrial design

Design Subtraction and Addition

# 66/18



LISTLAB



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# Design Subtraction and Addition

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The single-subject issue no. 66 of Diid offers an articulated reflection on the processes of "*subtraction and addition*" of values, meanings, signs, information, languages, functions, materials, technologies, skills, and visions. The various contributions offer design scenarios touching on the proposed theme, associating it with aspects of the contemporary in which tangible and intangible are reflected in the development of digital technologies on the one hand and the centrality of the disciplines of user experience and service on the other. Subtraction is valued as substitution with intangible practices, in which the digital element prevails. Addition is proposed as taking responsibility and expanding design's fields of interest. Many of the contributions investigate fertile scenarios and are addressed to those who study, are interested in, and work in the world of design, and represent an opening to and stimulus for new design possibilities.

Luca Bradini

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# The Algebra of Design

This article intends to focus on the dichotomy between tradition and innovation by rereading it from some of the “places” of the theoretical discourse developed by the design disciplines which reflect on the dynamics and phenomenologies of the sphere of artificial, starting from the assumption that the innovation brought about by design produces and is at the same time the product of a sort of semiosphere (Lotman, 1985), a hypertrophic dimension of sense that transcends objectivity, functionality, aesthetics, and that constitutes the cultural fabric capable of connecting past and future, tradition and innovation.

In thinking objects design produces symbols, cultural and aesthetic codes. As a “cultural system”, which spreads innovation, embodied in new knowledge, products, values and lifestyles, it creates new meanings by taking in ideas, cultures, philosophies, visions, images and imageries of an epoch. It absorbs, and at the same time modifies, its rites and traditions; it renews the sense of things, it produces new mentalities. New visions of the world. Sometimes new utopias. In other words, even the simplest object can never be isolated from the wider complexity of cultural phenomena. The analysis of simple words already shows that innovation brought on by design is located at the centre of a network of complex relations where the dominant features are “speech” and “rhetoric”, which legitimize its products that add value by diminishing the sense of extraneousness the new brings with it. To better exemplify the connecting role of design in the processes by which innovation is originated and spread, reference will be made in this text to some cases taken from the history and culture of design.

[ ordinary and unedited, singular objects, metanarrations ]

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Design introduces an extensive network of meanings into the social world, not only in the form of objects, but also in the form of discourses, expressions, stories, words said and written, visual images, signs, metaphors and places. Through objects, design renews the sense of things, it produces new meanings, changes traditions and mentalities. It interprets and adopts the representations of a society and its imagery and, through processes of material innovation, produces new ones. In doing so, design elaborates and re-elaborates a series of *escamotages*, as if they were “algebraic operations” of transformation of sense that operate by “adding and subtracting” elements of novelty; by “showing and concealing” the new; by “generating” – understood as “going beyond” – and “connecting” – understood as the act of building links between the new and the familiar, i.e. what constitutes the reference for our common feeling. In thinking new objects, design also places them inside the production of symbols, cultural codes, vocabularies which allow both to go beyond the dimension of technical gestures and of pure formal research, and access the unprecedented from within the routes traced by the ordinary. By relying on the original meaning of the term algebra understood as “union”, “connection”, “completion”, “adjustment”, we can consider design as a cultural community capable of balancing the processes of morphogenesis, which helps to promote and produce, with processes of morphostasis that come into play to restore the lost order. It does so by compensating for the feeling of extraneousness, of discrepancy that each innovation brings with it, taming the monster, by nearing, reducing the distance of what, etymologically, is typical of the prodigy, of the extra-ordinary. It is the use of literal symbols that distinguishes algebra from arithmetic. Letters allow to generalize, to spread results which, precisely because they are rendered independent of the contingency of individual instances, become theory.

And so in design, it is the literary component, the fabric of narratives that holds individual events together. In design words becomes reassuring, they introduce frames of meaning. The distance brought about by what is new is reversed, because textuality can construct a minimum common denominator between facts that are apparently unique. If we refer to the concept of tradition as a set of practices, normally governed by overtly or tacitly accepted rules and of a ritual or symbolic nature, which seek to inculcate certain values and norms of behaviour by repetition, which automatically implies continuity with the past (Hobsbawm & Ranger 1987, p. 3), a first point of view from which it is possible to observe the role played by cultural reassurance, and by references to tradition, is inscribed in the body of the object itself. The connection with the past is in fact constituted by the “matrix” of formal invariants crystallized in the “typology”, understood as the permanence of memory and of perceptive experience of the form, which constitutes a sort of stable backdrop – stable or varying only very slowly –, which plays an essential role in the process of recognition of the object and of its legitimation, on which infinite material, morphological, technological and aesthetic contingencies are grafted. In the process of formal construction of new objects permanence and continuity prevail in that the new feeds on the many references to the existing, to which it is anchored in order to go beyond it. A sort of “*formal sequence*” that Kubler

(1976, pp. 48-50) describes as a “historical network of gradually modified repetitions of one same trait” inaugurated by a *first object* that presents itself with the characters of originality. In the world of design, this sort of *armour* that defines the set of features common to objects that belong to the same formal class, is called *typology*. Typology plays an essential role in the process of object recognition. Its identity immediately refers to experience and context of use, gesture, forms of behaviour and habits.

However, there are historical moments in which technological revolutions introduce discontinuities that go well beyond the process of formal re-constitution, thus becoming real cultural revolutions. Examples of this are objects created by electronics and telecommunications (Burdek, 2008). But formal innovations can also originate from cultural hybridization processes that take place when the practice of planning is able to combine the richness of traditional techniques with new languages, redefining their characters and meaning. In this sense, the deposits of material culture and craft practices typical of a specific community and its territory become a real “cultural capital” (Throsby, 1999). They are, in other words, an aggregate of tangible and intangible factors that are recognized as having a cultural value which is continuously reinvested in the elaboration of new artefacts that are therefore perceived as *singular* (Kopytoff, 1986; Vacca, 2013) with reference to their appearance, performance or meaning. In these cases, planning operates on the one hand by translating the intrinsic values of material culture and on the other by re-mediating the territorial uniqueness that generated, incubated and preserved it. A new paradigm thus emerges – that of an *archetypal design* – expressed by the dialectical relationship between craftsmanship and contemporaneity: tradition becomes a narrative of identity, an expression of culture that is stratified in a territory which systematically incorporates it through a process of aggregation, subtraction, repetition, reiteration of the past itself until typologies of objects are re-generated, born anchored to their own cultural context and thus becoming themselves *singular* objects. If we look at objects within the cultural framework they are inscribed in, we will encounter the ways of doing and saying which, in their material, immaterial and symbolic dimension, embodied in textual, behavioural and cognitive artefacts, allow the new to find its place in tradition. Many concepts developed within the design community have the strength to produce effects of meaning that transcend the boundaries of the discipline and spread to the wider socio-cultural system, bringing expert knowledge closer to the system of the collective imagination. These are terms to be found throughout the history of design, which temporarily take on the role of synthesizers of complex interconnections that from the productive sphere, through objects, connect to cultural models, values and aesthetics. Or new sets of words that describe priority attentions and “filters”, capable of reorienting the reflection around the phenomenologies of the “object”, as is the case with the shift of interest that can be seen in the employment of words such as *structural skin*, *skin*, *surface*, linked to the related interest in *soft qualities*, *sensorialities*, *affordance* which are replaced by the centrality of terms such as *interface* with corresponding new terms such as *interaction*, *memory*, *access*. These

terms have an evocative value, they allow to refocus visions or consolidated practices and sometimes they act starting from the figurative use of language. For example, terms such as “molecular”, “interstitial”, “widespread”, which foster recent perspectives in planning – at different scales – starting with the “mother of all metaphors” embodied in the adjective “*liquid*” that Zygmunt Bauman (2002) has linked to the term modernity which, from a descriptive model, has become a style of thought. The same can be said of the recurrence of terms such as *mass creativity*, *widespread avant-garde* (Branzi, 2008) which absorb the sociological model of ubiquitous knowledge and are then codified in terms of planning thought in texts such as “*Design when Everybody designs*” (Manzini, 2015). Obviously these are not only new linguistic dictionaries but new phenomenological dictionaries in which each term carries with it deep logics of experience and thought. We are witnessing “linguistic inventions” that lead the practice of planning both towards the trajectory of “+ design” and towards that of “– design”. It is sometimes the association of words, themselves familiar, that is able to place planning in a new frame of meaning. Two pairs of extremely popular terms are a good example of this: “iconic product” (Bertola, Colombi & Vacca, 2016) on the one hand, and “*design thinking*” on the other. They provide definitions that represent an effective synthesis of two seemingly opposing visions of the nature of planning: design centered on the “product” and design centered on the “process”. Both originate “*in the wild*” (Linden & Christensen, 2018) through the spontaneous codification of particular successful strategies implemented in studies, organizations, companies. The “iconic product” celebrates the tangible expression of design, its ability to materialize products and turn them into real icons that denote systems of precise values. In this context, design operates by adding and subtracting and in line with tradition which, as Hobsbawm (1997) rightly argued, is authentic only inasmuch as it changes constantly. If this planning strategy is rooted in mature sectors such as fashion, furniture, the automotive industry, it then becomes pervasive, signalling the fact that the expected disappearance of “products” in their tangible dimension is not taking place. If ever, new technologies and the web enable forms of “amplified materiality” which, thanks to the “Internet of things”, project the systems of symbolic values underlying the product into a virtual dimension. The “iconic product” thus becomes an antidote to displacement because it is the guardian of memory and an identity prosthesis (Bertola, 2016). *Design thinking* (Brown, 2009) is a definition located at the opposite extreme and did not originate in established sectors but in American design firms with an orientation to radical innovation. These view “design”, which is a “cognitive process”, as having the ability to provide tools to guide the project, to build consensus, to materialize solutions and scenarios. *Design thinking* is therefore an effective linguistic invention that simply crystallizes a course of epistemological reflection which starts with Schön’s contribution (1983) and, with the contribution of many other theorists, recognizes that “design as process” has as a specific “cognitive” value. Both these definitions are an expression of the growing recognition that design is today one of the most powerful levers of semantization in the contemporary world. In addition to

new vocabularies, design, as a cultural system, produces many types of text within it. Design entrusts the task of creating a common background to exhibition and catalogues, to museum installations, to events, a true narrative expedient called upon to unify the objectual micronarrations in a single great story. But this same function is also and above all entrusted to the production of critical essays that in some cases present themselves as real *metanarratives* (Penati, 2013) called to connect projects, processes, objects. On some occasions they act as forerunners, messengers carrying the new that will come, such as the exhibition and catalogue *La Neomerce* curated by Santachiara in 1984; other times they are phenomenal descriptors and attest ongoing processes such as the exhibition and catalogue *The New Italian Design* curated by Branzi in 2007. However, it is also from the shop window, from the sales areas, from the large exhibitions, salons, commercial spaces, that design emits signals of change or interprets those it detects, re-elaborates and relaunches.

A place of urban and cultural recontextualization, the new trade system integrates images and signs that are essential for the triggering of new discursive practices. Its venues display a low level of *functional identity* (Branzi, 2005), oriented to privileging the dynamics of relationships. The new sales venues, becoming increasingly places of continuity between inside and outside, between private and public and between real and virtual, reconfigure the sense of the city: café-book stores, shop-art galleries, showroom-museums of companies. Design guides the new processes of meaning (Csikszentmihalyi, 1981; Krippendorff, 2006) and introduces new languages for the arrangement and display capable of innovating not only the form-function, but above all, the form-meaning.

To understand the phenomenal complexity of the innovation processes driven by design, in the transformative passage that goes from the values emerging from a consolidated tradition to those that tell of new planning realities, it can be useful reading the design system through the prospective offered by the concept of “*community*” and extending it beyond the widespread concept of “*communities of practices*” (Wenger, 1998) to that of “*textual community*” (Stocks, 1995) and of “*aesthetic community*” (Bauman, 2000), in short, of “*community of meaning*” capable of elaborating meaning through the creation of *know-how* and sophisticated skills that are shared through cultural practices; through the formation of new languages; through theoretical reflection that anticipates and guides innovation or decodes it; through the growth of peculiar sensitivities as well as interests and passions capable of elaborating implicit and explicit conventions and codes. We are looking at operations of “*addition of meaning*” that connect *a posteriori* or anticipate, carry, support, strengthen new content. The innovative balance is therefore the result of a transformative algebra that amplifies and slows, accelerates and brakes, that adds explanations, interpretations, images so as to mitigate the “*cognitive dissonance*” (Festinger, 1957) and the sense of estrangement and distrust that often accompanies the processes of innovation. In social psychology cognitive dissonance refers to the complexity of an individual’s elaboration of beliefs and notions in functional contrast with respect to a certain

theme. For example, we speak of dissonance for cultural customs in reference to dissonance relative to the context in which the individual finds himself. Likewise, a cognitive orientation to innovation leads us to consider not only the formal aspect of the product but above all the content underlying it. In this perspective, the creation of value takes place through the management of the meanings conveyed by the product itself within the context of reference, considering as relevant the implications not only for the end user but for the entire system of actors involved. Nicoletta Buratti and Michele Simoni (2003) have identified different forms of cognitive dissonance. The one generated by the difficulty of the end user to evaluate the innovation content of the product, which does not concern the ability to make the best use of its technical and formal performance, but the degree to which one assumes the innovative value of a product as representative of a given reality. For example, compared to the proposal of a new product, the consumer has to contextualize and recognize as adequate the new language with respect to the perceptual needs of his or her own social system. Generally, only a small group of users, called *early adopters*, is able to process and adopt the proposed cognitive value, favoured by the level of authority recognized to them and by a more or less significant media support. The transitional costs to be borne by the consumer in adopting the new product are not (only) of an economic nature but rather of a cognitive nature. By this we refer to the intellectual commitment required to maintain an adequate critical capacity in the interpretation of the proposed contents and to the psychological effort sustained in the process of symbolic alignment of one’s own identity code, with respect to the values transmitted by the new product, and the socio-cultural evolution. In the different *design oriented* sectors we find many examples of products/projects that arrived too early on the market or lacked the necessary narrative support capable of producing a context of meaning for their affirmation. First of all, the electronic and high-tech sector, from the high-definition DVD standard launched by Toshiba and defeated by Sony’s Blu-Ray standard, then in turn replaced by streaming, to the Google glasses, whose too high price, lack of privacy regulation and low design content required the Mountain View giant to completely rethink the project. And if, on the other hand, in the case of objects/projects that have been fully inserted or have opened up new design paths, breaking and then building meaning and therefore consensus, the fashion sector offers countless cases, it is with the rise of the *Maker movement* that one of the most interesting products/projects that have revolutionised the contemporary design approach took shape: the 3D printer that enables “*widespread design*” and changes traditional design processes, enabling new solutions and new meanings. What is necessary is a process of naturalisation, accustomization, adaptation and structuration of concrete, symbolic and behavioural contents – which are objectified through practices, narrations and images – in order to allow the *anchoring* (Moscovici, 1984) of the new in socio-cultural systems, progressively attenuating dissonance to the point of reaching *cognitive integration* (Grande, 2005, p. 73) which is produced when the new has acquired full value and social utility.

The functional dimension of the objects has, for some time, given way to that of meaning. The production of objects has been subjected to addition by the production of signs. Technologies, now domesticated, have become our friends. Innovation that enters our daily lives through design undergoes a process of naturalization. Paradigms and cultural approaches, visions and Schools, debates, experiments and research, actors, relationship systems, journals, competitions of ideas, places, exhibitions and shop windows, companies, brands, posters translate thought into words and images, into tangible and intangible assets that act as multipliers of value. In adding texts and discourses they build complex architectures of conceptual relationships. Deserti calls these discourses *Design phenomena*. Anticipators of trends, facilitators of emerging processes or interpreters of phenomena and processes already mature, together they play an essential role in the process of completion, of cognitive addition. They are unravelers, supplements of meaning. Dissonance reducers. From prototype to archetype to stereotype, they participate in the process of cultural construction of the material production system.

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**Focus**  
**gallery**



## To articulate and simplify

The spread of evolved enabling technologies marked the beginning of the digital era that has its roots in the combination between computation and advanced manufacturing. The two-way connection between the design process and the productive process does not imply a formal evolution without logical relationships, but technology is characterized as a process through which to materialize optimized products through an articulated and complex path that includes morphogenetic computation, the search for innovative fabrication methods and material. The complexity of the technological evolution becomes the means capable of transforming the articulated processes into material systems through direct connection, between digital model and productive process, converting articulated matter into an element generating synthesis. Control over the procedure becomes a digital model capable of metabolizing parameters relating to the materials, geometric constraints, and instruments used, establishing a new relationship between designer and product. In this design potential, the layering of design-to-production concepts (Scheurer *et al.*, *From Design to Production: Three Complex Structures Materialised in Wood*, 2005) and file-to-factory concepts (Burry Mark, *Models, Prototypes and Archetypes*, 2012) plays the essential role that leads to seeking design solutions, to the possibility of concentrating in a single workflow an operating methodology that involves defining a design through which to integrate geometric parameters, materials, and fabrication processes. To better comprehend this aspect, the following image gallery compares how articulated design approaches may lead to a rational simplification of the product. Complex fabrication processes are a driver of development for materializing the complexity of digital space.

Davide Paciotti

[ advanced manufacturing, optimization, making matter complex ]



01

### Designing complexity

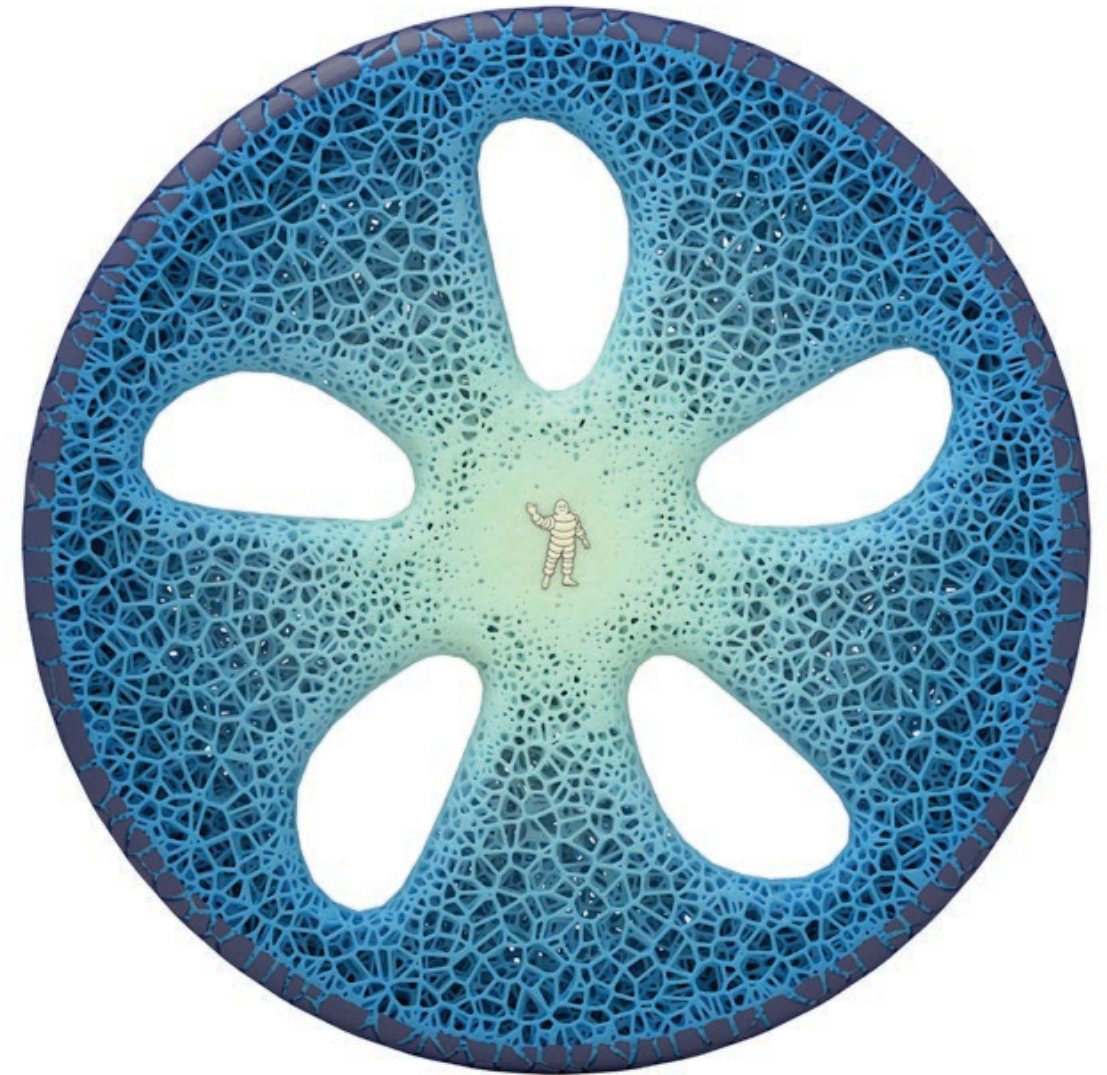
Programmed or designed performance, or a product's increased performance, is an additional step forward that enlarges the already broad possibilities offered by additive fabrication, with the objective of simplifying and streamlining an individual product's components that are commonly employed using programmable or self-assembling elements. Programmed morphology effectively transforms the final product into a specialized object.



02



03



04

- 01 *Adidas 3D Runner*, Adidas, 2016.
- 02 *4D printing*, Self-Assembly Lab, 2013.
- 03 *Shapes of Sweden project*, Lilian van Daal, 2015.
- 04 *Vision Tyre*, Michelin, 2017.



01

**Technological experimentation**

> In so prosperous a technological advance, the product is increasingly often faced with complex systems, or brings to light now-forgotten typological expressions in which its role no longer entails merely a rereading, but the outlining of a new language based on experience. The product of experimental research as a synthesis of structure, matter, and technology, in search of new interaction experiences.



02

- 01 *Edible growth*, Chloé Rutzerveld, 2014.
- 02 *Stone hand-axe number 5*, Ami Drach + Dov Ganchrow, 2014.
- 03 *Pneumatic Products*, Patrick Parrish, 2018.



03



01



02

### Articulating the intangible

> The implementation of technology also leads to exploring areas in which morphology, production technology, and typologies of materials lead to defining an absolute product quality. In certain musical instruments, this is possible in the transition from analog to digital; the product incrementally loses material quality and ends up a complex morphology or absence of material. At the same time, there are other objects that hold up practically unchanged over time, but their nature is strictly analogical, without that valance of communication and form that is the prelude for an integral vision of design.



03



04



05

- 01 Piezoelectric violin, Monad Studio, 2016.
- 02 Travel bass guitar, Monad Studio, 2016.
- 03 Detail of a shooting trombone, Anonymous.
- 04 Scaccia Pensieri, Anonymous.
- 05 SLG200 series, Yamaha, 2015.



01



02

03

**Material experimentations**

> The use of technology or the overlapping of a basic module or of a single material seen as support for the making of designs useful for people, characterizing the object in the contrast between light and heavy, which it satisfies in its complexity and in its reflective vision of reality.



04

- 01 *Research Pavilion* 2013-14 at the University of Stuttgart, ICD/ITKE
- 02 *Pom Pom*, Fernando and Humberto Campana, 2002.
- 03 *Favela*, Fernando and Humberto Campana, Edra, 2002.
- 04 *Magnetic Motion*, Iris van Herpen, 2014.
- 05 *Litracon*, Áron Losonczi, 2011.



05

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