Metadesign as an Emergent Design Culture

Elisa Giaccardi

Every time the word metadesign is used, it causes even more confusion than the word design. The term seems vague, elusive. Semantically, the principal meaning of the Greek word meta—when used as a prefix is “change of place, order, or nature” [1]. Historically, since the 1960s, the term metadesign has been used to focus on the possibilities of “designing the design”—possibilities that later, in the 1980s, were realized by using information technologies. In the last two decades, the idea of metadesign has appeared as both a theoretical issue and an operational methodology; however, it has always been an isolated concept, producing neither an established approach nor a coherent theory. The development of the notion of metadesign can be categorized as critical and reflexive thinking about the boundaries and scope of design, aimed at coping with the complexity of natural human interaction made tangible by technology. Metadesign seeks to transform this complexity into an opportunity for new forms of creativity and sociability. This text aims at tracing the development of the notion of metadesign and the multiplicity of its definitions by offering a map of correlated concepts and establishing the foundations of metadesign as a distinct and emergent design culture.

Metadesign in Artistic and Cultural Debate

Within the artistic and cultural debate, the idea of metadesign has primarily addressed the emergence of digital networks and biotechnologies. Both represent alternatives to “juridical” models of communication, interaction and life—as embodied by mass media and moral law.

In 1986, at the time of the emergence of advanced telecommunications and the first virtual communities, Gene Youngblood wrote “Metadesign: Toward a Postmodernism of Reconstruction” for Ars Electronica [2]. Inspired by the pioneering work of Kit Galloway and Sherrie Rabinowitz [3], Youngblood defined metadesign as a strategy for instigating a revolution in the communication world and overcoming the broadcasting style of mass culture. As such, metadesign deals with the creation of context rather than content; it is a mode of integrating systems and setting actions in order to create environments in which people may cultivate “creative conversations” and take control of the context of their cultural and aesthetic production (Fig. 1).

Some years later, in his 1995 essay “Networked Art and Virtual Communities” [4], Derrick De Kerckhove defined metadesign as a quality of the new art forms that were emerging over the Web in its early years. According to De Kerckhove, metadesign is the kind of design that puts the tools rather than the object of design in the users’ hands, and defines the conditions for the process of interaction rather than the process itself. However, in subsequent writings [5], De Kerckhove has addressed metadesign as a model of design actually mediated by digital networks rather than an emerging quality of design promoted by art experimentation. As such, metadesign can be described as the design of tools, parameters and operating conditions that allow an infinite flexibility in tailoring the industrial product and enable the end-user to take charge of the final design by choosing among many different options.

In the same period, Paul Virilio expressed shock at Stelarc’s techno-performances. In his book The Art of the Motor [6], published in 1995, Virilio wrote that he feared the advent of a neurological form of design directed at shaping our perceptual and cognitive systems via information processing and further directed at reorganizing the organic according to a machinic model. He called the aftermath of this “technomorphization” of society “metadesign.”

Biologist Humberto Maturana refuted the idea that such a process of adaptation to electronic media can ever take place in his emblematic 1997 paper “Metadesign” [7]. In this paper, Maturana argued that if a process of metadesign as design of living systems does exist, this enlarges the issue of design to include the nature of our very existence, and it implies an epistemological and ethical rethinking of the relations between human beings and technology. He strongly disputed any deterministic understanding of biological evolution, and therefore of “human design.” From Maturana’s perspective, metadesign is a dynamic work of art: It produces an aesthetic experience of the world that is intertwined with our social and technological present. Like art, metadesign has the potential to open up new relational dimensions and create a grounding reality in the course of human history.

The social construction of reality is for Maturana—from a
design perspective—an ethical imperative, as it is for Youngblood [8] and Gal-
loway and Rabinowitz [9]. On this point, Eugene Thacker, in a workshop paper,
“Bioethics and Bio-ethics,” for the 2002 conference “Towards Human Technolo-
gies” [10], explicitly tackled the question of biotechnological design and bioethics.
In this paper, Thacker tried to clarify that even though metadesign is a kind of de-
sign that is not instrumental, but ethical, it is nevertheless not based on a moral
law. Metadesign must allow a social mode of existence that is flexible and based on
mutual processes of affecting and being affected rather than on a juridical model.
According to Thacker, metadesign repre-
sents a critical and creative investigation
into the possibilities of transformation of
human beings and culture.

The ideas expressed around the last
decades of the 20th century by these few
but crucial theoretical writings on meta-
design—reflecting on the scope, bound-
aries and qualities of the expanded
design space that is engendered by in-
formation technologies—have found
some conceptual frameworks and opera-
tive methodologies in several application
domains. These ideas combine here with
design theory and methodology with
promising results.

CONCEPTUAL FRAMEWORKS
AND PRACTICES OF
METADESIGN

The notion of metadesign has been ap-
plied in many fields, including graphic
design, industrial design, information ar-
chitecture and system design. These ap-
plications have focused differently on the
concepts associated with metadesign,
ranging from processes of high-order de-
sign to participation and co-evolution.
However, these concepts are often tied
together.

The idea of reflexive thinking about
design has been commonly translated in
the application field as the “design of a
design process.” In graphic design and
industrial design, in particular, metade-
sign has primarily been connected to the
idea of working with computational
structures on a higher level of design
[11]. Because a computational object has
a discrete structure, parts of the object
can be easily accessed, modified and sub-
stituted by other parts; it is not fixed and
it can be generated and manipulated
without actually drawing it. In this con-
text, metadesign can be associated with
the passage from traditional typography
to interface design [12]. John Maeda
[13], in a series of short essays published
in Japan for MdN Magazine in 1995, men-

Fig. 1. Mobile Image, Electronic Cafe International, 1984. (© Kit Galloway and Sherrie Rabinowitz) An early example of a metadesign
environment, ECI was a telecommunications system characterized as an accessible, flexible and end-user-modifiable system that allowed
users the greatest possible freedom to design and control their own information environments.
tioned the concept of metadesign in relation to his idea of graphic design not as printed image but as “reactive” computer programs (Fig. 2). In architecture, similarly, Lars Spuybroek promotes metadesign techniques [14] as tools for constructing dynamic spaces where people can unpredictably and creatively interact with their environment (Article Frontispiece, Fig. 3 and Color Plate F No. 2).

Considering the capability of code to define “transformation rules,” Celestino Soddu has addressed metadesign as the design of an “artificial DNA” since 1989 [15]. In his work, the objective is the design of “species of design”: the designer is the producer of an “executable idea” (the generative code), and the consumer is the one who chooses one of its possible realizations. The creative process defines a “seed” able to generate endless variations recognizable as belonging to the same idea but open to change by the client. Thus, the final consumer will choose from this endless sequence of variations the result that better fits his or her needs and subjectivity (Fig. 4). Like De Kerckhove [16], Soddu empowers the user as consumer, making him or her proactive, but does not question the user’s passive role as designer. Evolution here is the result of the execution of a notation and its exploration, rather than the aftermath of the user’s full participation in the creative process. In this generative process model, the “seed” can be defined and modified only by the designer.

In the last few years, two organizations have been working on frameworks and applications of metadesign: the Laboratory for Architecture and Urbanism (Lab[au]), a collective of artists, architects and computer scientists based in Brussels; and the Center for LifeLong Learning and Design (L3D) of the University of Colorado at Boulder. These two organizations have developed research agendas that incorporate most of the aforementioned theoretical statements and operational methodologies. Lab[au] has adopted the term metadesign with the objective of enacting a new discipline of information architecture [17]. For Lab[au], metadesign is a matter of the setting of codes that allow data to be organized in spatial and temporal forms—that is, a design process of a higher order. Participation and evolution, however, are important. The integration of user interaction over time is a key element in the collective’s work, and it represents an active component in the structuring of information itself. Sim-
ilar to Galloway and Rabinowitz [18], Lab[au] focuses on the construction of electronic spaces, viewing information not as content but as an environment in which users’ perceptual and cognitive capabilities can be expanded (Fig. 5).

At the Center for LifeLong Learning and Design, however, metadesign seems to have undergone a conceptual and operational development that places it in the context of current debate in design theory and methodology. Gerhard Fischer and his colleagues, particularly in the last few years [19], have consistently focused on metadesign. Conceptually, metadesign represents to them the question of how to create new media and environments that allow users, when needed and desired, to act as designers and be creative. By providing users with social and technical support, the environments designed at L3D are intended to sustain users as the actual “owners of problems” [20]. Operationally, metadesign is viewed at L3D as a design methodology characterized by activities, processes and techniques focused on creating socio-technical environments that empower users actively and collaboratively to engage with the original designer(s) in the continuous development of a system and to design solutions that range from the creation of content to the modification of code (Fig. 6). The conceptual framework developed at L3D reflects some important objectives shared with user-centered and participatory design, but it transcends these objectives by changing the processes by which systems and content are designed. To Fischer and his colleagues, it is clear that existing design frameworks and methodologies are insufficient to cope with the emergent aspects of reality and to support creative practices [21].

**UNFOLDING METADESIGN AS AN EMERGENT DESIGN CULTURE**

By tracing a conceptual map of metadesign theories and applications, we can see that some elements emerge as crucial: a focus on the design of general structures and processes, rather than on fixed objects and contents; the need for methods and techniques that are fluid, rather than prescriptive (such as diagramming or seeding [22]); the call for environments that can evolve; and the necessity of relational settings that allow systems to be based on a mutual and open process of affecting and being affected.

Considering the current debate in design theory and methodology, we see that the contours of this map reveal a thoughtful reflection on controversial design issues, such as the problems of anticipation, participation and emergence [25]. Users’ needs and tasks, as well as situations and behaviors, cannot be fully anticipated at design time because they are ill-defined and change over time. Therefore, users need to be engaged in the problem-framing/problem-solving process, both when the system is designed and when the system is used. Keeping the system open to participation and evolu-
tion at use time is meant to join social and technical systems, not only to make them optimized and efficient, but also to let new conditions, interactions and relationships emerge. In this way—by sustaining emergence and evolution—new forms of sociability and creativity can develop and innovation can be fostered. The focus of metadesign on the successful integration of methodologies of design by anticipation, participation and emergence translates into the identification of a multidimensional design space [24]. Whereas operational similarities show metadesign to be a consistent development in design theory and methodology, the cultural path that metadesign theories and applications reveal is not unidirectional. On one side, metadesign has been considered as a networked model of design aimed at product refinement, personalization and mass customization. According to this approach, metadesign is conceived as a new praxis of design that does not question the role of the user in the process of production as consumer but rather empowers the user in this role. This development relies on operational assumptions about metadesign, but it does not fully achieve its potential as a new design culture. On the other side, and more interestingly, metadesign has been conceived as co-creation: a shared design endeavor aimed at sustaining emergence, evolution and adaptation. According to this development, the operational terms and potential of designing at a higher-order level must be joined to a more reflexive and collaborative practice of design.

Art practice and cultural debate have been extremely active in promoting metadesign as a reflexive method of thinking about and beyond design, rather than as a new praxis of design [25]. The idea of metadesign developed by Yevgeny N. Lazarev and colleagues as a result of a reflection on the emerging relationships among art, technology and science is another case. Concerned with an expansion of human creativity, Lazarev writes:

The specific perspectives of metadesign are hard to define since it is quite a new phenomenon. But one can already see an exceptional vitality in this trend, whether it remains within the domain of design or transforms into a phenomenon of human creativity that has never existed or been possible before [26].

The connections between metadesign, telematic culture and interactive art are significant and based on a similar call for the expansion of human creativity. Some overlaps, in particular, are interesting and can be pointed out as further indications of how metadesign actually expresses the emergence of a new culture, somehow at the convergence of art and design. The idea of the interactive artist as a “systems designer,” for instance, elaborated by Margot Lovejoy in her book Postmodern Currents: Art and Artists in the Age of Electronic Media [27], recalls Galloway and Rabinowicz’s [28] idea of the metadesigner as a “systems integrator.” Even more interestingly, some ideas expressed by Roy Ascott in his article “The A-Z of Interactive Arts” [29] recall the operational methodology typical of metadesign: the idea of “seeding,” defined as a way of designing that should replace top-down designing, the idea of a “non-trivial interactivity,” conceived as an
open-ended and infinite interactivity capable of accommodating always-new variables; and the idea of “open-ended systems” (OES), in which interaction takes place within networked and evolving systems that put the user or the environment in control of the interaction itself.

IS METADESIGN A WORK OF ART OR A WORK OF SCIENCE?

This paper introduces and promotes metadesign not simply as a new design methodology, but as a cultural development exploring the new design space engendered by information technologies and ultimately concerned with expanding the creative process of emergence and invention of the world.

Metadesign represents a cultural shift from design as “planning” to design as “self-creating.” By promoting collaborative and transformational practices of design that can support new modes of human interaction and sustain an expansion of the creative process, metadesign is developing toward new ways of understanding and planning with the goal of producing more open and evolving systems of interaction. Metadesign can be seen not only as a design approach informing a specific design methodology for the development of interactive media and environments but also as a form of cultural strategy informing and integrating different domains. Rather than a new model of design, metadesign represents a constructive mode of design: an enhancement of the creative process at the convergence of “art” and “science.”

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References and Notes

1. See terms such as metalinguistics and metadada, but also metaphorsm.
8. Youngblood [2].
9. See [3].
11. In industrial design, for instance, metadesign is primarily used to mean the construction of a template that makes a product “that thing” without actually designing it.
12. I owe this consideration to Lev Manovich, with whom I had a short e-mail correspondence on the relationships between metadesign and interface design.
18. See [3].
22. From a metadesign perspective, seeding is a participatory and evolutionary technique that allows the modification of a system and its adaptation to users’ emergent needs. The SER Process Model (Fig. 6) articulates this technique in three different stages. (Seeding, Evolutionary Growth, Re seeding).
24. For a more detailed description of the design space entailed by metadesign, see Giaccardi [23].
25. Here, “reflective” is used to indicate not only the critical attitude of reflecting upon oneself, but also the process of transformation that such a behavior involves.
28. See [3].
31. Here I mean “making” in general—that is, any human activity where some kind of production is implied.

Glossary

co-creation—the emergent process of constructing and sharing intelligent and meaningful activities, expressed by a socio-technical environment conceptualized as a complex system.

evolution—the evolution of a socio-technical environment conceived as a living entity, by which changes of each participant in the interaction process (either the software or the human subjects, variously organized) influence the evolution of the other participants. In metadesign, co-evolution can occur by either gradual or disruptive adaptation.

design—generally conceived as the conception and planning of the artificial (or the invented) as a normative form of science (“how things ought to be”) in contrast to natural sciences (“how things are”) [30]. Design is better defined today as an inquiry and experimentation in the activity of “making” [31]. That is, design is a humanistic enterprise in which the subject matter is not fixed [32] and is meant to allow us to envision possibilities and elaborate them (“how things might be”) in order to enable people to experience the world in more and richer ways [33].

emergence—the stage of metadesign in which planning is superseded by participation and the open processes of co-evolution and co-creation. The promotion of tacit knowledge and situated actions—and consequently new forms of creativity and sociability—is crucial at this stage.
evolutionary design—evolutionary design can be either generative or interactive—that is, it can rely on either the absolute autonomy of the software or the human guidance of the process; the further development of an initial “seed” (or a structure created by the seed) to adapt it to needs that were not accounted for in the original design. It aims at the best possible solutions through cycles of either parameterization or exploration.

generative design—the design of a piece of software (“seed”) capable of autonomously generating design proposals by notation and execution. It allows the
generation of endless variations recognizable as belonging to the same designer.

metadesign—conceptualized as the design of a “metaproject,” metadesign shares with generative and evolutionary design the focus on the design of initial conditions or “seeds.” In this sense, it methodologically comprises both generative and evolutionary design. However, metadesign transcends them by incorporating the principles of participation and emergence and by changing the way in which systems and content are designed (see co-evolution and co-creation).

Elisa Giaccardi has a background that brings together humanities, media and design. An abstract of her doctoral dissertation is available on LABS at: <http://leonardolabs.pomona.edu/>. She is currently a Research Associate at the Center for LifeLong Learning and Design (L3D), University of Colorado at Boulder. In her work, Giaccardi combines interaction design, media arts and cultural management. She has lectured and published on several occasions and she is a member of editorial boards and committees for MIT Press, ACM and The European Journal of Higher Education. Her interdisciplinary research in the convergence of communication technologies and the humanities was awarded the European grant “Ideas for the Future” by Fondazione Eni Enrico Mattei in 2001.

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