

## Design thinking between rationalism and romanticism - a historical overview of competing visions

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### ABSTRACT

**This article presents a *longue durée* history of design thinking with particular focus on recurrent ideological tugs-of-war between two competing visions: Enlightenment ideals of logic, rationality and civic order against Romanticist ideals of artistic creativity and social change. Drawing on design history and cultural studies, the authors present a broad overview of more than 200 years of developments in European and North American design thinking, from the rise of design as a profession to the formation of a science of design. The article contributes to the history of design thinking by presenting the influence of specific, sociocultural configurations on design culture.**

### 1.1 DESIGN THINKING BETWEEN COMPETING VISIONS

Design is becoming increasingly important in all sectors of society, but not important in the same sense. "Everything is design", boasted the famous American architect Buckminster Fuller in 1960, and current academic debates seem to repeat his statement, often claiming an all-embracing role for design. In Fuller's sense, design is the rational master discipline of modern life, providing coherence to the planning of its material as well as immaterial aspects. This mode of thinking runs as an unbroken thread through design thinking since the Enlightenment. However, slogans such as "less is more" (associated with the architect Mies van der Rohe), "design is thinking made visual" (attributed to the designer Saul Bass, see e.g., Bass & Kirkham, 2011) or "design is art with a purpose" (used by many, e.g., O'Nolan, 2009) reflect other popular understandings of design as a process of form-giving with both functional and artistic purposes. In various ways, these articulations of design culture can be seen as rooted in Romanticist ideals.

The idea of design as rational planning activity often clashes with artistically oriented approaches. This shows for example when increased academization of design schools leads to the marginalization of artistic and manual crafts skills.

In this article we present an overview of the history of design thinking as it has moved between contrasting visions and conflicting ideological positions, mainly focusing on developments in Western cultural history that have contributed to the two formations identified above. In doing this we simplify and reduce complexity so as to present an overview and clarify an argument. We do this to create a framework for continued reflection on the nature, quality and potentials of design culture and to suggest that developments in design thinking might be better grasped in light of what we see as recurrent ideological clashes.

### 1.2 OPPOSING VIEWS IN DESIGN THINKING

Until the 1700s, no definite, conceptual separation existed between artistic production and the technical crafts. Design did not exist in the modern sense of the word. The concepts *Ars* (art, from Latin: skill, craft and Greek: just) and *Techné* (from Greek: craftsmanship; Harper 2015) had overlapping meanings, in the sense that both had to do with mastery of skills. Art was predominantly seen as a unity of truth, beauty, and goodness and as such endowed with both a functional purpose and the power to heal society and transcend ordinary life to experience the symbolic and spiritual world (Shiner 2001). This changed gradually, as a new design concept emerged in the mid-eighteenth century with the early industrialization of society. Here the word "design" gradually came to be associated with mechanical production for mass consumption based on the combined aim of continuing traditions of good craftsmanship and drawing on the transcending forces of art.

The separation of art from craft has been termed the Great Division by philosopher Larry Shiner (2011). According to Shiner, this Division was initiated in the early 1700s when art was detached from servicing the church and other patrons of art as a result of an emerging bourgeois economy, Enlightenment thinking and emerging rationalism. With the Great Division, art became dependent on market conditions and, inspired by emerging romantic ideals of art as a transformative force, this created the basis for the cult of the artist as genius (Williams, 1958). Art and poetry were idealized as special forms of cognition beyond theology, philosophy, and science.

This development was conveniently supported by a new aesthetic theory, formulated by the German philosopher Alexander Gottlieb Baumgarten (1735). He introduced a philosophical discipline of aesthetics (aisthesis) as a science of the sensed and imagined, which was defined in opposition to the logics and rational cognition hailed by rationalism and Enlightenment thinking: "Philosophy and poetry are scarcely ever thought able to perform the same office, since philosophy pursues conceptual distinctness above everything else, while poetry does not strive to attain this, as falling outside of its province" (Baumgarten, 1735; quoted in Wessell, 1972, p. 337).

The gradual separation of arts from crafts created the basis for a new profession of artists, who in their own romantic self-understanding were defined by being exalted and by having special knowledge or insight. To them, art must serve only its own purposes. The arts were in practice set apart from everyday life, leaving a space of utility for the crafts, which in turn increasingly came to be defined by their usefulness and function while retaining elements of artistic performance and associations with the transcending and healing power of art.

We claim that modern design thinking in its present state represents both Enlightenment ideals of rationalism, expressed as aims of utility and function, as well as ideals of intuitive creativity and change drawn from the romantic period.

In this article, we understand rationalism as building on ideals of objectivity, logical reasoning and scientific formalism, which in the 1800s led to the articulation of the positivist scientific doctrine by Auguste Comte. Rationalism was challenged by romanticism, which we understand as synonymous with the artistic, literary, and intellectual movement originating in late 18th-century Europe (cf. Williams, 1958). Romanticists protested against the idealization of

pure logical reason and against the mechanical empiricism associated with ideas of social and natural progress which dominated the ambitions of the time.

## 2.1 INDUSTRIALISM VS. COMMUNITARIANISM AND TRADITIONALISM

Our narrative starts with the emblematic Great Exhibition of 1851, which can be seen as a first, prototypical instance of tug-of-war between the two competing visions. At the time, the Great Exhibition was regarded as the triumph of mechanization and industrialization, but also as "a striking proof of the concentrated power with which modern large-scale industry is everywhere demolishing national barriers and increasingly blurring local peculiarities of production, society and national character among all peoples" (Marx & Engels, 1850). The fair took place in London's Crystal Palace, which was planned, designed and built for the exhibition according to rigorous scientific standards celebrating progress (Engholm & Michelsen, 1999, p. 16; Sparke, 2013, p. 90). Enthusiastic supporters of industrialism saw the exhibition as a significant move away from ideals of craftsmanship towards a systematized, scientifically standardized efficiency.

In line with Marx and Engels, romanticist crafts people and artists regarded the industrialized mechanization reflected in the Crystal Palace as a threat to society. They also feared for craftsmanship and sensitive artistic creativity (Engholm & Michelsen, 1999, p. 36). In the 1860s the British romanticists and early socialists, John Ruskin and William Morris organized an opposition to the mechanical-industrially minded movements of the period. Their Arts & Crafts movement viewed the advance of industrialism as destructive to society and alienating to humanity (Jackson Lears, 1994, pp. 62ff). As a reaction to what they saw as the degeneration and disenchantment of society, they strove to preserve and promote pre-industrial methods in architecture and design, drawing inspiration from previous generations of romanticist artists in their tribute to free artistic creativity. Where Enlightenment thinkers such as Rousseau, Descartes and Voltaire had regarded the medieval period as a "Dark Age" of irrational ignorance and intellectual gloom (Montoya, 2013, pp. 46-47), Morris explicitly idealized the medieval period as an age of harmony, communitarianism, authentic work ethics, and knightly romance (cf. Agrawal, 1990; Sayre & Löwy, 2005). With a unique socialist interpretation of romanticism, medievalism and organicity, Arts & Crafts activists promoted their understandings of good craftsmanship, manifested in their own artisanal manufacture of furniture, textiles and wallpaper. The Arts & Crafts

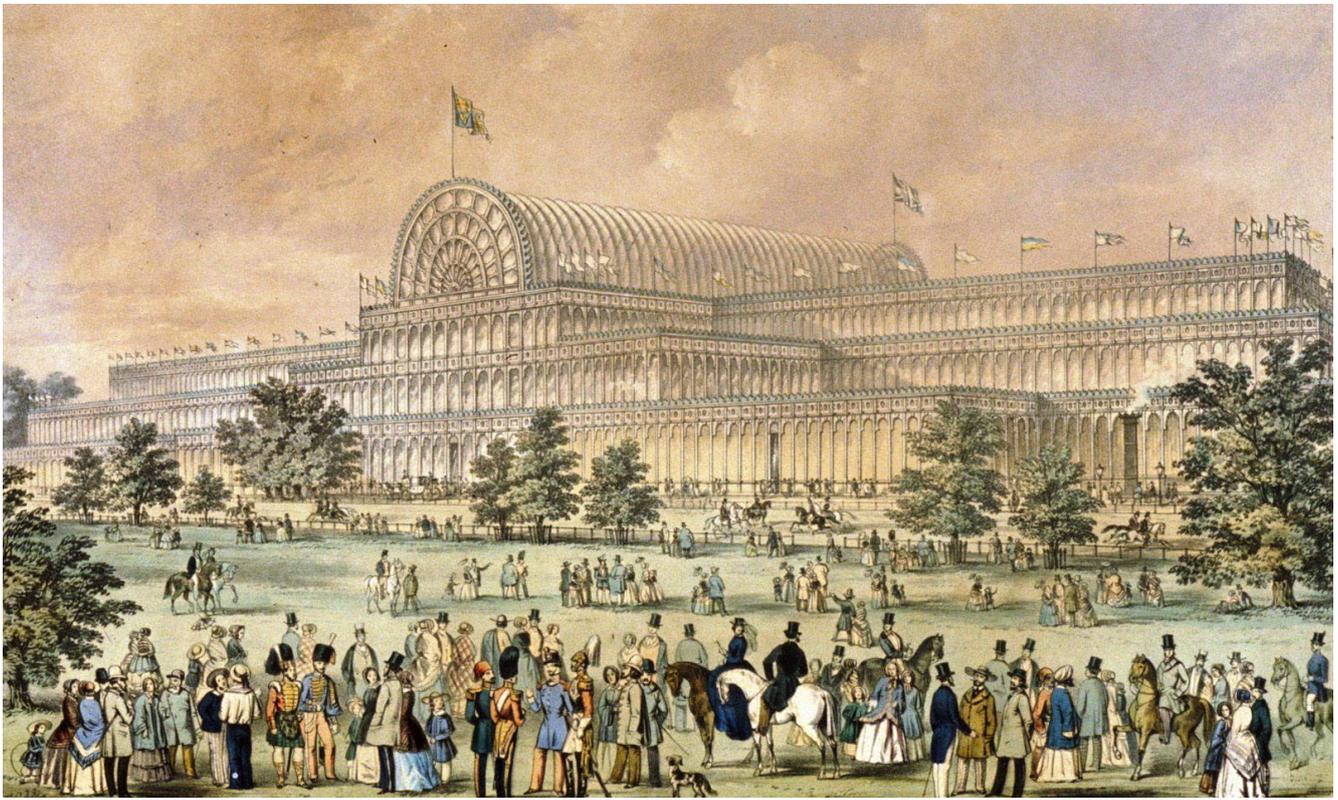


Illustration 1. The triumph of industrialization: planned, targeted art. Crystal Palace in London, the scene of the first industrial World Fair in 1851. The grand presentation of industrial products was set in an engineered, kit-like building made of steel and glass. Inside this “palace” the international audience could, for the first time, go “window-shopping” in the huge display of new industrial products. The architect Gottfried Semper, who a few years previously had been an activist in the nationally and constitutionally freedom-seeking German

revolutions of 1848–49, reviewed the World Fair positively, advocating a new, targeted art to reflect rapid mechanization and industrialization. This new art form was envisioned to combine new scientific and technological advances in a universal and organic relationship between art and society. Other critics of the exhibition—among them British craftspeople and artists—saw the event as part of a trend threatening craftsmanship and free artistic creativity.

promotion of artisans and craftsmen as socially liberating and creative figures was a crafts-focused parallel to romantic notions of artists as liberating and socially healing agents.

## 2.2. FIN DE SIÈCLE: ROMANTICIST REVIVAL AND NEUE SACHLICHKEIT

In design history, the Arts & Crafts promotion of artisanal handiwork and nature-inspired organicity is generally seen as continued in the art nouveau and Jugend movements that emerged in the years leading up to 1900 (e.g., Haufe, 1998, pp. 39ff; Raizman, 2003, p. 66). Pioneers of these movements in Europe produced new variants of sensuous, nature-inspired organicity in a nature-symbolist idiom, which was applied to a wide register of products. They produced lamps and glass, graphic design and furniture, some of which verged on regular objects

of art while preserving an artisanal character. The organicist Jugend movement was in many ways a continuation of the romanticist trend.

Other academics, technicians and artists worked with a declared aim of furthering mechanical mass production. Among the early pioneers of this latter endeavor, design historians have pointed to the Prussian architect Peter Behrens as trendsetting (e.g., Haufe, 1998, pp. 62ff; Lucie-Smith, 1983, pp. 99ff). Behrens collaborated with AEG to develop factory facilities, industrial products, and graphic communication materials. All his products were imbued with a new sense of *Sachlichkeit*: a form of objectivity and austerity, which came to characterize several generations of Northern European designers. With this, he launched a less adorned and more functionalist version of the earlier Jugend organicity and matched what he saw as the “new character” of electric technologies (Haufe, 1998, p. 62). The *Sachlichkeit* take on Jugend organicity

reflected the more formal and objectivist approach of a world of scientifically planned, industrial engineering—albeit still with the declared objective of transferring crafts qualities to industry.

The first decade of the 1900s saw a bitter conflict between these artistic and industrial trends among art nouveau and Jugend crafts practitioners. In the debate, defendants of free artistic creativity clashed with those believing in compromise-seeking cooperation with commercial industry (Posener, 1981, p. 24). However, the outbreak of war halted the debate, as design architects and engineers now came to serve the interests of a militarized industry and a nation at war. This accelerated the technical innovations, not least those needed for the German war machine. High-tech factories such as AEG drew on the work of designers for the construction of airplanes and other war equipment.

### 2.3. ARTISTIC EXPRESSIVITY VS. INDUSTRIAL PRODUCTION

The enormous societal upheavals created by the First World War involved political revolutions and ideological radicalization. Ambitious visions for the arts, architecture and design came to be seen as integral to social reform projects and associated with improving living conditions for the growing workforce in the industrial sector.

Gradually, most of the political spectrum had come to believe in more efficient industrialization as the remedy against mass poverty and other social ailments after the destructive war. The actual social and material conditions meant that new design endeavors often had to build on artisanal workshops rather than industrial production. In this context, avant-garde laboratories for design and architectural experiments appeared in Germany and other



Illustration 2. Interior from William Morris' house in Kent, built in 1860. With the declared intention of reinstating the central importance of artists and craftspeople in society, influential Arts & Crafts ideologues—such as William Morris—challenged what they saw as the “soullessness” of industrially produced utensils: The alienation of workers in anonymous factories, growing pollution and low-quality products called for reform. The introduction of a new craft concept was to represent “honest” work and a return to medieval techniques and

designs, which were seen as yet untainted by industrialism. Combining romantic medievalism with organic vitalism and socialism, the Arts & Crafts movement promoted craftsmanship and developed a specific style in artisanal furniture, textiles and wallpaper. It also presented artisans and craftsmen as potentially liberating and creative social figures—corresponding to the romanticist idealisation of art as a healing power in society.



Illustration 3: Vladimir Tatlin's Monument to the Third International (1919-22), a 22-foot-high (6.7 m) iron frame on which rested a revolving cylinder, cube, and cone, all made of glass, which was originally designed for a massive scale, and one of the main monuments of Russian Constructivism. The members of this movement saw themselves as part of the young Soviet revolution, and their projects were intended to contribute to a "construction" of the new Soviet society. In the Constructivists' view, art would directly reflect the modern industrial world. By 1921, Russian artists who followed Tatlin's ideas were calling themselves Constructivists and in 1923 a manifesto was published in their magazine Lef: "The material formation of the object is to be substituted for its aesthetic combination. The object is to be treated as a whole and will be of no discernible 'style' but simply a product of an industrial order like a car, an aeroplane and such like. Constructivism is a purely technical mastery and organisation of materials." The Constructivist artists and architects were committed to complete abstraction with a devotion to modernity. Objective forms carrying universal meaning were considered far more suitable than subjective or individualistic forms.

parts of continental, post-war Europe and Russia. These grew into influential platforms for new versions of Arts & Crafts-inspired organicity, communitarianism and socialist ambitions. Also, new romantic notions of artistic expressivity, spirituality and genius appeared in these environments. The notion of a cultural avant-garde presented a new take on the romantic celebration of gifted artists; a "first mover" group separated from mainstream culture but leading it nonetheless.

### 3.1. ARTS AND CRAFT IN INDUSTRIALIST DISGUISE

Social unrest and severe moral and economic crises in Europe after the First World War intensified the need for mass production of goods, and mass industrialization generally came to be accepted

as a necessary premise for social development. Design would have to fit into this strategy, but serial industrial production methods presented artistic challenges to practitioners (Haufe, 1998, pp. 64–85). The war had brought technical developments with potentials for furthering industrial profits as well as raising the material living conditions of the population. Some of the artistic avant-garde movements saw these potentials and endorsed design as a modern and important profession. The activists believed that design would improve living conditions in industrialized society, while also acting as guardian of craftsmanship and artistic expression.

The German Bauhaus School (1919–1933) was prominent among the avant-garde movements, which shaped this "First Machine Age" in European design (Banham, 1960). Until it was forced to close at the

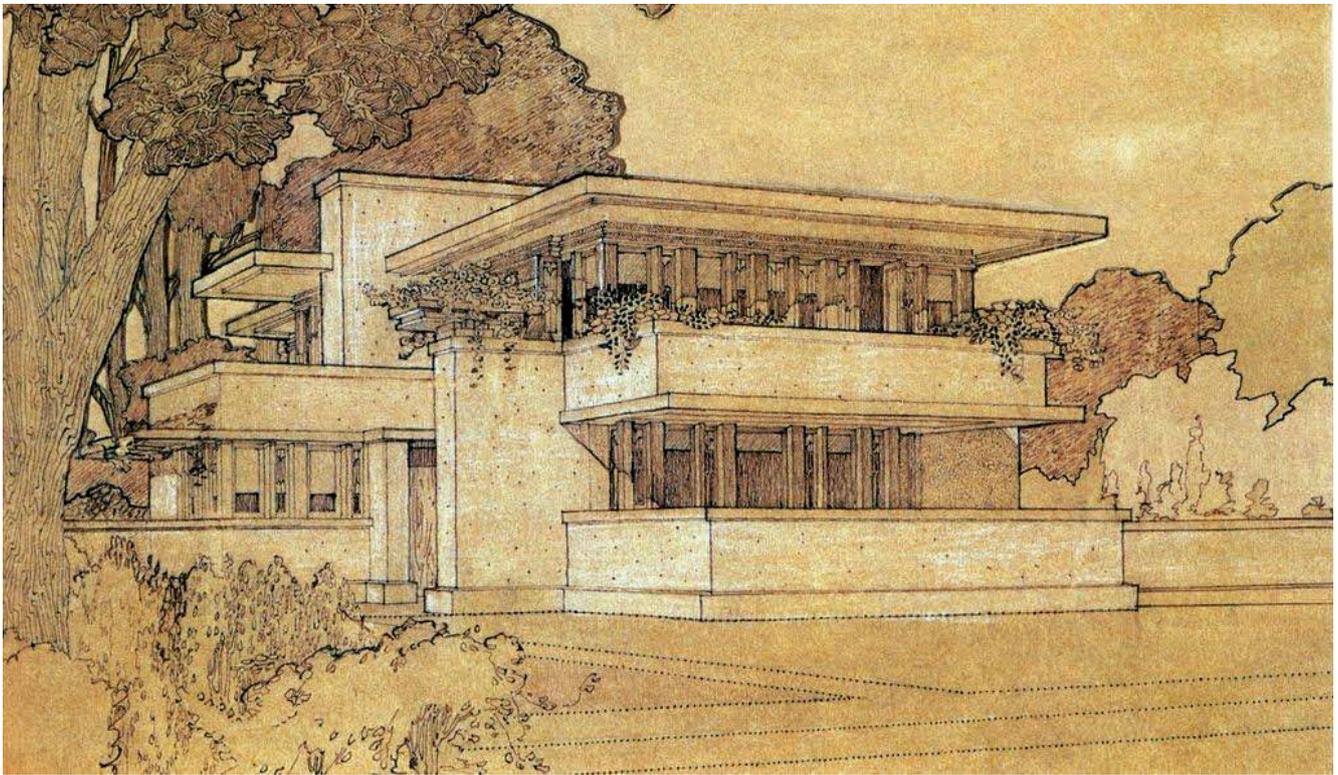


Illustration 4: In an American context, the work of architect Frank Lloyd Wright represented a step towards a more industrial, but still nature-inspired design ideal. It was a reaction against what he saw as the period's "senseless" historical architecture, in which historical forms were attached as backdrop.

Instead he introduced modern handicraft ideals based on artistic expression combined with scientifically inspired theories about space, form, function and appropriateness. Wright used

the popular American building tradition to develop his famous "prairie house" from the 1890s and onwards. Here functional approaches grew into a new kind of architecture that experimented with industrial materials such as concrete and glass. The result was flexible building structures that allowed for experimental spatial experiences of an "organic entirety", where the interior space of architecture would correspond to its external form.

Nazi takeover in 1933, Bauhaus was both an educational institution, a productive crafts commune and an avant-garde cultural movement driven by strong social, artistic, spiritual and even industrial ambitions. It represents an important moment in the development of both avant-garde crafts culture and modern design thinking, forging links between arts and serial mass production and contributing to breaking down the formerly established hierarchy between "fine" and "applied" arts: In the Bauhaus Manifesto, the first rector of the School, Walter Gropius (1883–1969), described the aim of his institution as bringing about a new fusion of Arts & Crafts suited for the industrial age (Gropius, 1919). While formally aiming for an industrial age, the school in practice focused more on crafts and arts than on actual industry, especially during its initial years (Heskett, 1985, p. 36; Raizman, 2003, p. 186). The name "Bauhaus" literally played on romantic visions of a medieval, artisanal work ethos characterizing the imagined craftsmen who had built Europe's grand, civilizing cathedrals while living frugally in

simple huts. Bauhaus drew on these Arts & Crafts ideals to expand their concept of building ("Bau") so as to include not only architecture, but also the construction of furniture, utilitarian objects, textiles, and art. Their aesthetic language idealized a simplistic functionality that in principle would allow for easy mass production, but in practice most designs were not suited for mechanized, serial production (Raizman, 2003, p. 186).

Bauhaus teachers and designers also fostered a specific holistic, romanticist concept of Gesamtkunstwerk ("a unified work of art"). The concept had originally been introduced by the controversial German composer Richard Wagner (1813–1883) to hail what he had seen as perfect wholeness by integrating all the individual components of artistic production into a single art experience of total aesthetic immersion (Harrington, 1996, p. 24; Munch, 2012, pp. 14ff). In Bauhaus terms, the uniting factor would establish a new guild of craftspeople and artists to "conceive and create the new

building of the future that will unite every discipline, architecture and sculpture and painting, and which will one day rise heavenwards from the million hands of craftsmen as a clear symbol of a new belief to come" (Gropius, 1919). In this radical vision, architecture, crafts, and art would mutually enrich each other, planning for and giving form to an improved, modern society.

### 3.2 HUMANISTIC FUNCTIONALISM AND MASS-INDUSTRIAL PROGRESS

Bauhaus originally envisioned an avant-garde role for their crafts-arts-designers. By the late 1920s this romantic vision gradually was superseded by ambitions for collaborating with industry. The educational program was altered, and scientific methods were introduced into the practical and creative work with form and color experiments. Scientifically informed user studies were applied to architectural work, reflecting both international trends and a stronger social awareness (Haufe, 1995, p. 78). Mies van der

Rohe, who succeeded Hannes Meyer as rector in 1930, de-emphasized crafts and organicity in favor of industrial functionalism involving aesthetic formalism and geometric rationality. Mass-produced materials and pure geometric space and shapes represented new ideals of beauty (Haufe, 1995, p. 79; Engholm & Michelsen, 1999, p. 55). An abstract "heroic modernism" was the new ideal. It coupled geometric grandeur with serenity and simplicity of form. Bauhaus products increasingly looked industrially mass-produced, even in cases where they were in fact made by hand (Jencks, 1985).

In spite of its relatively short existence, many experiments and very different artistic personalities (including the painters Lyonel Feininger and Vasily Kandinsky), Bauhaus created a specific and coherent vision for design as a significant ideological force in modern society. Encompassing romantic Arts & Crafts artisanal ideals, modern consumptive functions, and scientifically organized mass industrialism, the Bauhaus design approach came to



Illustration 5: Ford industrial workers on tour and at the assembly line of the Ford factories. In 1920 a smug Henry Ford could claim that "the hours of labor are regulated by the organization of work and by nothing else. It is the rise of the great corporation with its ability to use power, to use accurately designed machinery, & generally to lessen the wastes in time, material & human energy that made it possible to bring in the eight

hour day. Further progress along the same lines has made it possible to bring in the five day week." Ford was a pioneer of "welfare capitalism" designed to improve the lot of his workers and especially to reduce the high employee turnover, with many departments hiring 300 men a year to fill 100 slots. According to Ford, efficiency also meant hiring and keeping the best workers.

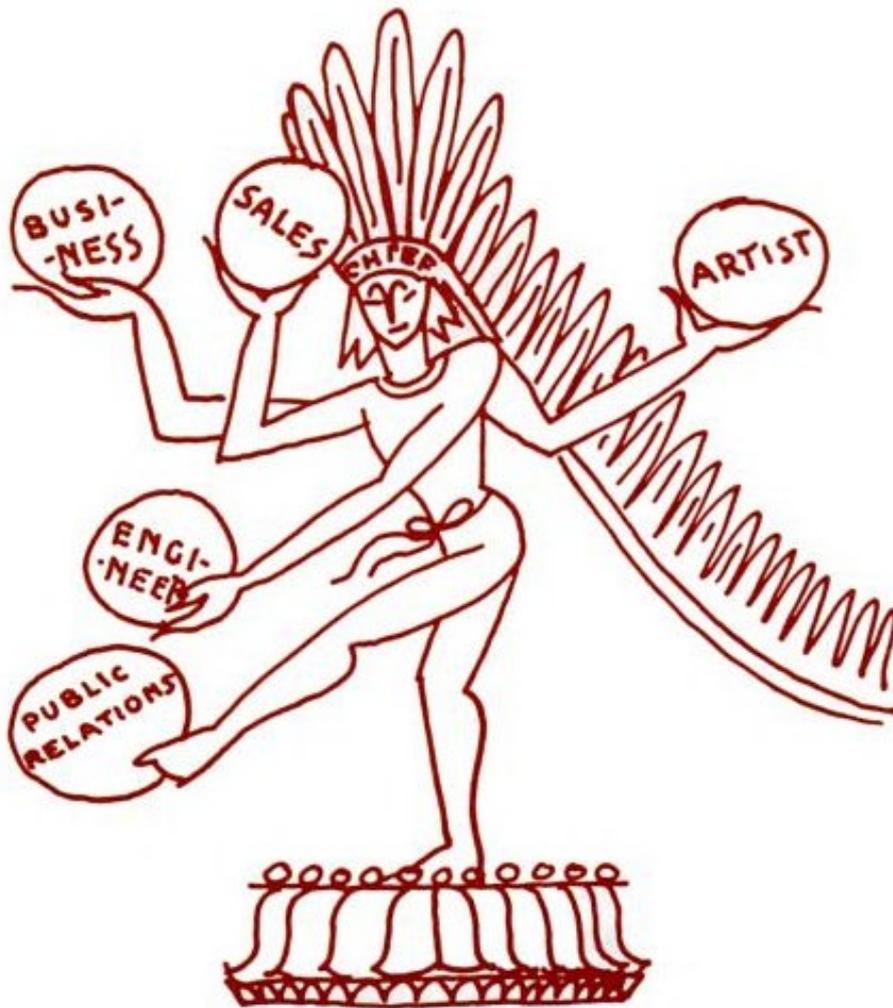


Illustration 6. In a visual representation of the new, interdisciplinary designer figure by which he also identified himself, Henry Dreyfuss portrayed a native American chief combining a full range of qualifications in one single individual, covering engineering, PR, marketing, sales, and artistic creation. This designer was involved in shaping products, but also held expertise in several other design-related disciplines, and was able to act as a qualified industrial project partner for production, sales, and marketing professionals.

From Henry Dreyfuss: *Designing for People*, 1955.

influence design thinking ever after. Today Bauhaus must be seen not only as one of the most internationally influential avant-garde institutions of the 20th century, but also as an example of the modern ambivalence in relation to the role of Arts & Crafts that continues to characterize design debates today.

### 3.3 INTERNATIONAL STYLE AND MODERN DESIGN THINKING

On the other side of the Atlantic, mass-produced industrial design was seen as equally relevant for providing access to inexpensive, basic consumer goods. This was an urgent matter during the Great Depression following the financial crash of 1929. The subsequent political reforms aimed to stimulate the recovery of production. Here design could play a role in the necessary product development. The rapidly developing and capitalized industrial mass production system engaged a new, interdisciplinarily oriented and trend-conscious type of designer, focusing on the needs of the market and the consumers. French-born engineer Raymond Loewy and

American set designer Henry Dreyfuss were among the pioneers introducing a new kind of sensuous design in cooperation with industry. In the 1930s, they spearheaded the introduction of so-called Streamlining (streamforming) as a new design ideal for the development of broadly desirable consumer products for general consumption (e.g., Sparke, 1987, p. 164; Haufe, 1998, p. 97). Especially in the design of everyday objects, this design approach created shapes representing flow and movement, which alluded to industrial speed and scientific efficacy (Sparke, 1987, p. 167; 1998, pp. 120, 130). Design's capacity for visual differentiation could create an advantage in a competitive situation where efficient marketing and added symbolic value grew ever more important for industry. With Streamline, design increasingly became a matter of external product dimensions and appearance (Engholm & Michelsen, 1999).

#### 4.1 ULM, RATIONALIZATION AND THE QUALIFICATION OF CRAFTS

During this period, fascist, Nazi, and communist totalitarian regimes in Europe all used design to maximize the effect of their propaganda campaigns, and soon also in their war efforts during the Second World War. Design played a role in planning as well as in providing the ideological projects with grandiose aesthetic effects. Both fascists and Nazis worked with professional graphic design programs (Heller, 2008). For example, in Germany, an SS Oberführer (i.e., senior colonel) and design school graduate designed the black SS uniform together with a graphic designer in 1932, and the notorious uniforms were produced by the Hugo Boss clothing company (Kopper, 2014). As had been the case

during the First World War, the Second World War radically accelerated inventions, design, and industrial production for military purposes.

After the enormous devastation of the Second World War, the national governments of the victors and a number of newly created international organizations worked to establish social stability, economic growth and welfare in Western Europe. One of the most ambitious post-war design programs was developed at Hochschule für Gestaltung in Ulm, Western Germany (1953–1968). This design school identified itself as building on the legacy of Bauhaus before the Nazi takeover (Lindinger, 1991, p. 10). Ulm’s ideal was Gute Form (i.e., good form), which became an epitome of European welfare design.



Illustration 7. In Europe, there was no “New Deal” to boost consumerism and design during the decades after the First World War, but the fascist, Nazi, and communist movements and regimes all used design for political propaganda purposes and in their new war efforts. Both fascists and Nazis applied professional graphic design programs. For example, in Germany in 1932, the black SS uniform was designed by a graphic designer together with an SS-Oberführer (senior colonel) and Nazi Party member, who was also a design school graduate. The notorious uniform was then produced by the Hugo Boss clothing company. Here, 1933 Boss advertising for National Socialist uniforms and illustration from Organisationsbuch der NSDAP (published by Der Reichsorganisationsleiter der NSDAP, Zentralverlag der NSDAP, Munich 1936, first edition).

Photo: Vialibri.net/ Librairie Dejolibelle.

With its emphasis on ideally sober and rational solutions, it appeared as an almost explicit rejection of not only the grandiose and often medievalist-romantic Nazi aesthetics, but also of the American Streamline tendency to link design with superficial “styling.”

Drawing inspiration from psychology and Gestalt theory, the designers of the Ulm school called themselves *Produktgestalter* (product shapers). Their form-giving ideal had rational planning and optimization of function as its goals. In the Ulm designers’ own self-perception, *Produktgestaltung* was a coordinated team effort rather than an intuitive artistic practice: “Produktgestaltung ist keine Kunst und der Produktgestalter nicht unbedingt ein Künstler. (...) Der Produktgestalter wird Koordinator sein. Es wird seine Sache sein, in enger Zusammenarbeit mit einer Reihe von Fachleuten die verschiedenen Erfordernisse der Herstellung und des Gebrauchs zu koordinieren,” as the school’s rector, Tomás Maldonado, declared. (“Industrial design is not art nor is the designer necessarily an artist. . . . He will be the coordinator. His responsibility will be to coordinate, in close collaboration with a large number of specialists, the requirements of product fabrication and usage”—Maldonado, 1958, p. 35).

In keeping with its explicit focus on industrial work, functional optimization and rationalization, the Ulm school initiated systematic studies of design methods with the purpose of achieving a more rational and efficient design process. To that end, design methods were placed in a scientific context with the

explicit rejection of those design aspects that could not be put on a rational formula—among these, art (Cantz, 2003, p. 39).

An etymological definition of design as planning was now developed into an understanding of *Produktgestaltung* as a methodologically substantiated activity. Although the Ulm school professionals deliberately differentiated themselves from Streamline by avoiding the word design, they too were engaged in developing welfare by design. In contrast to their American colleagues, however, they based their endeavor on ideas of frugal simplicity and the optimization of functionality rather than on appealing aesthetics. The Ulm school was also interested in form, not in terms of market-driven style or added value, but rather as a matter of functionality and expediency: a modern interpretation of “form follows function,” which later stylistically came to be synonymous with a rational understanding of design.

Purity of form and dedication to the needs of the user combined with efficient industrial manufacturing, which would drive down the cost of production: These factors were to make German-made products desirable again, thus contributing to a German economic recovery and growth after the lost war. The Ulm project is an example of how functional design made for mass production was developed and made accessible to large parts of the post-war populations in the modern, mainly Western European welfare societies. However, the consequences of focusing on efficient function and rational optimization



Illustration 8. The Ulm School represented post-war West German welfare design marketed as “Gute Form” (good form) across design genres from urban rail systems to spectacle frames. Gute Form was rationalist and often based on simple geometry aiming to suit systematic production. Here, exemplified by Hans Roericht’s stackable table service TC100 for Thomas Rosenthal AG, 1958. The numbering indicated the systemic approach to production and introduced a rationalist design concept based on systems thinking and functional optimization.

while abandoning intuitive artistic practices and human elements from planning processes would soon become apparent.

#### 4.2 THE THEORIZATION OF SCIENTIFIC-SYSTEMATIC DESIGN THINKING

In line with the Ulm school initiatives, the first academic conference on design methods was held in London in 1961—a major event in the formation of modern European design thinking after the Second World War. According to the main organizers of the conference, John Chris Jones and D. G. Thornley, the declared aim of the conference was to render the design profession scientifically research-based and enable a broader understanding of the role of design in industrial society. In line with Ulm's gradual marginalization of artistic dimensions, the organizers explicitly rejected the role of craft-based designers whose practice they regarded as conventionalist: based on experience and "educated intuition." They advocated methods guided by what they saw as sophisticated analytical processes fit for a world of systematized creativity, regarded academically systematized, positivist design methods as superior to crafts based design practice, and believed that scientific principles must be applied, not only in design practice, but also to judge and govern this practice. The conceptualization of design as essentially a form of planning was the ideal norm, to be expressed as a scientifically substantiated activity. Accordingly, design tasks were to be defined as design problems that could be solved through rational approaches (Bayazit, 2004, p. 17; Goldschmidt, 2014, p. 11).

Key sources of inspiration for this approach were cybernetics and computational systems thinking, especially in the form operationalized by the American military to control complex processes developed for Cold War rearmament and for the recently inaugurated space exploration program at NASA. Mathematics and formal logic served as problem-solving tools (Bayazit, 2004, p. 17; Engholm, 2011, pp. 144ff). A key characteristic of the scientific-systematic approach to design was reliance on systems models where processes must be broken down into clear-cut, sequential stages where each stage had to be completed before the next was initiated. Similarly, design problems were broken down into sets of smaller problems in order to make them more manageable (Cross, 1984, 1993; Lundequist, 1992; Goldschmidt, 2014). Much in tune with the academic trends of its time, the London conference echoed the high modernism of this period. This development aligned scientifically structured professionalization of design with the production

strategies and technical formats of a rapidly industrializing society. Romantic notions of Arts & Crafts-based design seemed to be a thing of the past.

#### 4.3 RATIONAL PLANNING FOR IMPROVEMENT

In the United States, multidisciplinary scientist Herbert Simon was involved in cybernetic and systems theory related to the social and behavioral sciences and had published influential work on administrative decision making. In 1969 he published the book *The Sciences of the Artificial* where he described design as a concept and approach that was not the exclusive domain of designers and architects, but could be applied across a wide range of professions. According to Simon, "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones. . . . Schools of engineering, as well as schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design" (Simon, 1969, p. 67).

To Simon, design was a matter of systematized planning aimed at improving a given product or situation. This approach contributed to further expanding the field of design and the role of designers to encompass a range of studies, professions and activities. Designers worked as corporate employees in large organizations, developing and marketing products; and design merged with engineering, business strategy, and systems sciences. With this expanded and rationalist concept of design, its praxis moved even further away from romantic ideals of artistic intuition and communitarian craftsmanship. Simon's expansion of the concept of design sparked debate in design circles: what future roles could be envisaged for design and designers? What criteria should guide an ideal, rationalist, and scientific design theory? What academic and professional terminology should characterize it?

#### 4.4 PUSHBACK: SCIENCE SKEPTICISM

The 1961 London conference inspired additional conferences and publications addressing design in light of prevailing scientific theories (see e.g., Cross, 1984; Lundequist, 1992; Goldschmidt, 2014). Gradually, the linear, stage-based methods endorsed at the first conference came under fire. At a symposium in 1967 in Portsmouth, UK, for example, the architect Geoffrey Broadbent concluded that the symposium was set up as a confrontation between, on the one hand, proponents of mechanistic, quantitative, and behavioristic methodology and, on the other, defenders of qualitative, existentialist, and phenomenological approaches concerned with the

“humanness” of human beings (Bayazit, 2004, p. 19). In spite of their disagreements, the factions agreed to exclude the artistic disciplines from their field of design studies. They shared the aim of establishing systematic and scientific design theoretical genealogies that would form the basis for an actual theoretical design science (e.g., Rittel, 1972; Broadbent, 1979; Cross, 1984, 1993; Lundequist, 1999; Bayazit, 2004).

In 1973, these debates resulted in an attack on the early scientific methods. The former Ulm methodologist Horst Rittel collaborated with American social economist and urban planner Melvin M. Webber in criticizing what they called the “first-generation design methods” of the 1961 design conference. Rittel and Webber found the linear, stage-based methods poorly suited for the complex issues—labeled “wicked problems”—of design (Rittel & Webber, 1973). In the early 1970s societal context of Cold War, grassroots activism, and ideological upheavals, they criticized earlier design methodologists for having elevated the designer to an objective expert and for systematizing reality and trying to put it into formulas (Rittel in Cross, 1984, pp. 320, 325). Their critique came at a time when positivism was losing ground in the social sciences, and when the humanities were absorbed by Marxism, critical theory, (post)structuralism, and semiotics. It was a time of raging public debates on democracy, authority, technology, and the romantic return of a revolutionary avant-garde with experiments in communitarian living. In this intellectual climate, Webber and Rittel argued that the design process should now be viewed as an exchange between designers’ draft proposals and users’ needs and evolve in dialogues and interaction between a broad range of experts and future users. They replaced the linear design process of the “first-generation methods” with circular, iterative processes of partial conclusions (Cross, 1984; Rittel & Webber, 1973). The design process was to become an arena of negotiation where arguments must be weighed and compared on the way to emerging, shared understandings of the nature of the problem and its eventual solution (Cross, 1984, pp. 102ff; Engholm, 2011, p. 52). Rittel and Webber deliberately distinguished their method from previous design methodologies, calling it a “second-generation method.” Even though they stressed the dynamic character of the processes and the role of participants in the outcome, they maintained a prescriptive methodological approach to problem solving in the design field (Rittel & Webber, 1973; Cross, 1993). In spite of the romantic undercurrents of the 1970s, concern with complexities and user needs, the methodology remained essentially empiricist and

rationalist. Design processes did not include any of the avant-garde heroism, inspired styling, or other forms of artistic creation found in earlier periods of reformative design thinking. As Horst Rittel wrote in 1972, “the second generation [principle] rests on the insight that nobody wants to be ‘planned at.’ . . . [The] planner is not an expert and he sees his role as somebody who helps to bring about problems rather than as one who offers solutions to problems. . . . He is a teacher more than a doctor. Of course, it is a modest and not a very heroic role that such a planner can play” (Rittel, 1972, p. 394).

In Rittel’s view, the designer was first and foremost a planner and facilitator, and in that role the formerly so important elements of crafts, arts, and spirited talent were eliminated in favor of strictly rational approaches to problem-solving.

## 5.1 POSTMODERNIST DESIGN METHODS AND SOCIAL CONSTRUCTIVISM

In the 1980s new winds of change blew through the design debates. Early digitization and high-tech production methods, neoliberal government ideologies, and globalization with incipient outsourcing to low-cost areas challenged design in new ways. In academia, social constructivism, deconstruction, and criticism of modernity were among the main trends. In society at large, the political system and institutions of the post-war era were under attack, popular culture was shaped by “anti-establishment” subcultures, and environmental problems were subject to scientific study and public concern. In this climate, a new wave of design methods and approaches to design gained ground, framed by postmodernism and early post-industrialism, and influenced by the prevailing scientific focus on contextual and situative factors.

The new design approaches, labeled “third-generation methods” (Cross, 1984), de-emphasized generalizable methodology in favor of a focus on the singular character of the process itself. In accordance with postmodernist ideas, focus was on the situatedness of the design process, where every design situation was assumed unique. The British architect and psychologist Bryan Lawson was one of the “third-generation” methodologists who combined design methods studies with qualitative studies of actual designers’ practices (Lawson, 1980/2005). He argued that rather than serving as universal and rational decision-making tools, methods should instead serve as situated devices to facilitate a specific design situation. With this perspective, Lawson challenged the prescriptive and generalizing design methodology. It was no longer the role of theory to

provide normative prescriptions for the components in an ideal design process. Instead, theory must provide the tools enabling a specific description of the process (ibid., p. 108). In Lawson's view, the classic, sequential model of analysis—synthesis—evaluation must be rethought as consisting in equally important stages. The designer and any other participants involved in the design situation could navigate between these design activities in a free and iterative process (Lawson, 1980/2005, p. 49). In line with the technology skepticism and criticism of technocratic rationalities gaining terrain in the 1970s and 80s, the British design researcher Nigel Cross took Lawson's suggestions one step further and suggested that designers had become too focused on efficiency-enhancing methods and process management (Cross, 1984). In keeping with postmodern theory addressing existential complexity, diversity, and ambiguity, Cross criticized what he perceived as rigid and overly structured approaches to design. Instead, he appealed to design theorists to acknowledge that real-life design processes follow an unsystematic course, and that solutions emerge ad hoc (Cross, 1984, p. 86): "The key seems to be flexibility of approach, which comes from a rather sophisticated understanding of process strategy and control" (Cross, 1984, p. 92).

## **5.2 BEST PRACTICE AND ABDUCTIVE WAYS OF KNOWING—MOVING CLOSER TO ROMANTICISM?**

Cross, Lawson and others writing in the 1980s, 1990s and early 2000s worked with an empiricist aim of scientifically documenting design processes and design knowledge in detail so as to identify best-practice approaches for design development (see e.g., Friedman, 2000; Galle, 2002; Lundequist, 1992; Goldschmidt, 2014). These design method studies strove for full scientific understanding of design methodology in practice by analyzing work in progress, identifying its components and the conditions that shape it as a whole. Another goal was to identify cognitive factors characterizing designers' ways of working, participating and engaging in a process; which might be called a post-modernist-inspired epistemological shift in perspective (Engholm, 2011, p. 52). Nigel Cross later summed up the described characteristics of design work as "a designerly way of knowing" (Cross, 2006), which involved professionally derived access to qualified insight into given tasks and situations as well as expertise in production-related and cultural contexts. These scientific endeavors gradually moved away from a search for unambiguous factors to an acknowledgment of ambiguity; from a focus on universal and generalizable factors to contextual and situative factors; from linear causality to holistic

interpretation; and from generalist perspectives towards subjectivity. Designers were now thought of as professionals with particular insight and knowledge, remotely echoing romanticist notions, but still firmly within an empiricist and rationalizing epistemic framework.

Epistemologically speaking, abductive reasoning was gradually introduced as a new analytical device for understanding "how designers think" (Lawson, 1980/2005). In Lawson's writings the logical methods of deduction and induction were associated with reductionist logics and analytical processes that characterize engineering, while the abductive approach was found to describe the designer's mindset and practice. Abductive design processes were put forward as approaches aimed at breaking with the status quo and arriving at novel ideas (Lawson, 1980). Donald Schön, who at the time was very influential in US organizational theory, presented qualitative studies of design practices and viewed abductive thinking as a design practice based on qualified guesswork and proposals (Schön, 1983). Based on phenomenological and empiricist sociological studies of professional practice, Schön's work enabled new understandings of design as a professional methodology. As a whole, the renewed interest in abductive thinking and designers' ways of knowing bore resemblances to earlier romanticist notions of intuitive, artistic understanding and privileged insight.

## **5.3 DESIGN STUDIES AS A MULTIDISCIPLINARY PRACTICE**

Parallel to the 1980s spread of British design methods research, design researchers in the United States (among them architect Richard Buchanan and art historian Victor Margolin) sought to develop a general theory of design as a broader discipline (Margolin & Buchanan, 1995, Buchanan & Margolin, 1998). These design theorists were less focused on defining an ideal practice for professional designers. In extension of Herbert Simon's expanded design concept, they rather suggested a broader understanding of design practice as a process-based method that could also be practiced outside the narrow confines of professional design, across areas of specialization and disciplinary boundaries. In line with British design methods research, design studies in the US focused especially on design processes, but also represented a broader approach that included analyses of design thinking, design history, material culture, and meta-theoretical issues concerning the theory of science and terminology of design.

With inspiration from the growing emphasis on context in the theory of science, and driven by post-structuralism and phenomenology, studies of the objects, methods, and processes of design were supplemented with an interest in the impact of context and subjective perceptions on the development and interpretation of design. An interest in epistemological and ontological discussions in relation to professional disciplines and positions also characterized the field.

Generally speaking, design studies represented a growing emphasis on theory and reflection about design. Throughout the 1980s and 90s, the field was gradually consolidated as a multidisciplinary research environment with its own publications, conferences and journals, including the UK-based journal *Design Studies* (launched 1979) and the US-based journal *Design Issues* (launched 1984). The multidisciplinary nature of design studies activities reflected the increasingly diverse context of design, which made it difficult for design researchers to define exactly how far they must adapt the perspectives of other scientific and professional disciplines. As Richard Buchanan commented, “those involved in design research are easily drawn into research in other fields” (Buchanan, 2001, p. 17). Buchanan in fact considered the issue of defining a boundary in relation to the theory of related disciplines as “the central dilemma of the new design research,” and he asked, “(w)hat is the nature of a discipline that brings together knowledge from so many other disciplines and integrates it for the creation of successful products . . . ?” (Buchanan, 2001, p. 17).

The answer to Buchanan’s question could be found in Don Norman’s *The Psychology of Everyday Things*, in later editions renamed *The Design of Everyday Things* (1988), which epitomized the scientific approach to the product-user relationship. Norman jokingly referred to the acronym POET (for the first edition) as evidence of the special role of the designer, but his cognitive-scientific approach left little room in the analysis for artistic creativity and intuition. Instead, it served to integrate the rapid progress of cognitive psychology with state of the art design methods.

Several other design studies in the 2000s were characterized by combining the study of meaning-making with other research areas such as marketing studies (including semiotics), consumer studies and design semantics exploring the impact of context on the construction of meaning associated with design objects. Design semantics were introduced by Ulm School graduate Klaus Krippendorff in his widely quoted article “On the Essential Contexts

of Artifacts or on the Proposition That ‘Design Is Making Sense (Of Things)’” (1989), and later further developed in *The Semantic Turn* (2006). In this book, he combines insights from systems sciences, interaction design, cognition theory, social sciences, and semantics to study how people attribute meaning to design objects and, consequently, how they interact with them. Krippendorff’s work was part of a turn in design studies towards phenomenology and semantics. In academic design studies this also showed as a shift away from the academic study of individual design objects to scientific analyses of design contexts. In other words, a shift in attention from the *what* of design to the *how* of design; from the object itself to the way in which it is treated and addressed.

Design research has grown rapidly since the turn of the millennium, which has made it increasingly difficult to exclusively determine and define its character and domain. Beginning in the 1980s, and significantly since the 1990s, a growing number of design schools around the world have become research-based and have emphasized the application of science to practice. The practice of the design profession today furthermore involves multidisciplinary approaches. These developments have fueled intense debate over the institutional and scientific boundaries of the design field as well as the professional competences of designers. In the wake of these shifts, crafts-based and artistically anchored design expertises have come under further pressure.

#### 5.4. DESIGNING INNOVATION—ENGAGING THE USERS

British design methods research and design studies in the United States were not the only academic endeavors trying to systematically define the field of design in this period. The 1980s had seen the emergence of a specific subject area dealing with design methods as a tool for corporate management: *design management*. The Design Management Institute (DMI) had been established at Massachusetts College of Art in Boston, USA in 1975. In 1986, the Institute of Design (ID) at Illinois Institute of Technology launched the *Design Processes Newsletter*, and later that same year, ID launched *Design Management Review*, which manifested design management as an independent practice and research discipline. The emergence of design management as a new field occurred at a time when a growing number of business executives were beginning to realize the economic and symbolic potentials of design (Salamon, 1998). There was a growing demand for design consultancy in



Illustration 9. The return of the sensitive designer-artist as an “interpreter” of modern society, with special attention to market differentiation. According to marketing professor Roberto Verganti, companies such as Apple, Alessi, and Nintendo have become successful because of their ability to create new frameworks for free creativity to unfold in collaborations between designers and artists, with sufficient sense of trends and cultural sensitivities to create new and radical innovations.

This kind of creation is not driven by designers listening to the explicated needs of users, but rather by designers giving the users what they do not yet know that they need... Here, rationalist marketing analyses have been replaced with models for companies to establish collaborative professional networks with culturally intelligent interpreters, who understand and shape the markets they work in.

connection with product differentiation, market surveys and innovation. In the design management literature of the 2000s, analyses of design methods and designers’ knowledge were combined with insights from organizational and management theories, focusing on the potential of design approaches, user empathy, and methods for value creation on several corporate levels (e.g., Borja de Mozota, 2003; Lockwood, 2009; Cooper, Junginger & Lockwood, 2013). Similarly, brand management studies undertaken during this period began to focus increasingly on the role of design as an organizational strategic resource and capability (e.g., Abbing & van Gessel, 2008; Karjalainen & Snelders, 2010) and organizational, cultural mind-set for strengthening the management of brand identities (e.g. Nedergaard & Gyrd-Jones, 2013).

Verganti introduced studies of the most successful companies in the northern Italian design and fashion cluster, among others Alessi and Artemide, to argue in favor of this “design-driven” approach. He adopted the definition of “design as meaning” proposed by Klaus Krippendorff to argue for design as an ideal innovation tool, both in terms of its process and its mastery of form and style as well as emotional and symbolic values.

Other post-2000 design studies have been characterized by combining the study of meaning with marketing research. The Italian professor Roberto Verganti introduced a design driven approach to marketing studies in *Design-Driven innovation* (2009). In this influential book, he argued that companies should focus on radically changing the emotional and symbolic content of products, e.g., their meanings and languages, through a deep understanding of broader changes in society, culture, and technology. Rather than basing the innovation of new products on user observations, design should offer new creation and conveyance of meaning.

Verganti’s take on innovation and uniquely design-driven approaches has been used to explain the remarkable success of expensive consumer products. Still, users are given increasing attention as central agents in contemporary design processes and industrial product development. In recent years, design approaches primarily relying on anthropology and ethnography have been attributed to a so-called “ethnographic turn” within design studies (see e.g., Laurel, 2003; Button, 2000; Halse, 2008; Gunn et al., 2013). Inspiration from classic ethnography’s participant observation methodology has fueled so-called co-design initiatives, involving non-designers in all or large parts of the design process, also beyond pinpointing and defining an initial design problem. Now users and other stakeholders are assigned the role of “co-designers” in creating a collaborative design solution (e.g., Sanders & Stappers, 2008; Brandt, Binder & Sanders, 2013). Co-design is concerned with making processes transparent to users to enable them to make meaningful contributions.

In that process, design techniques of sketching, prototyping, and scenario building are combined with ethnographically inspired methods of observation and dialogue in order to gain insights into users' life worlds. In line with the ethical debates and advocacy ambitions characterizing activist social science initiatives of the early millennium, co-design approaches of the 2010s have been concerned with design scientists' methodical use of empathy to achieve better understanding of users by "rehearsing the future" together with prospective users. In this perspective, users have turned into designers, and professional designers have turned into enablers of new possibilities. Since the turn of the millennium, this framework has presented new challenges to design professionals and design education. Professional, artistic designers with crafts-based training from design schools rooted in the Bauhaus and Ulm traditions are in many contexts replaced by design anthropologists, design engineers, design managers, service designers, and other professionals, who often have no aesthetic or artistic training nor any sense of connection to either Bauhaus or Streamline ideals. Artistic and semantic sensitivities are often overruled by empiricist analyses of user needs for the sake of market appeal.

## 6. WILL ARTS & CRAFTS STRIKE BACK?

We have now reached the late 2010s, both in our own writing present and in our narrative on selected and canonically significant moments of modern design history. We have presented the history of modern design thinking so as to support our hypothesis: that developments in design have been significantly shaped by recurrent ideological tug-of-war between two competing visions: on the one hand, scientific ideals of logic, rational planning and systemic order rooted in a European Enlightenment agenda and on the other hand, romanticist ideals of artistic creativity, aesthetically refined intuition, and radical social change.

Current design theoretical debates seem to indicate that we are at another turning point where "everything is design" and where systematic process rationalization as well as empirical user studies dominate the field to an extent where the concept of design keeps expanding to encompass ever new scientific areas and societal projects. "Designer" has become a processual role which may be undertaken by a broad range of professionals, in parallel with "project manager" or "quality controller". Meanwhile, the reception of Verganti's work as well as a growing public interest in traditional crafts and the potentials of merging these with digital

technologies such as 3D printing to create new forms of artistic design indicate that design thinking may well take new turns, or possibly split out into new fields of research and practice. Romantically rooted visions of spontaneous and free expression as well as trained intuition and artistically driven creativity have not disappeared as they have a significant impact on the public understanding of "design" as well as the self-perception of many design professionals. In this narrative we have presented our understanding of the development and changes in this perception of design. We have shown its romantic legacy and have presented its shifts, mutations and challenges in European and North American societies characterized by increasingly industrial, modernist, technocratic and commercial objectives demanding rational systematization and scientific evidence of profitable efficiency. However, the history of design thinking is not over; new societal and scientific concerns manifest themselves in debates over ontology and the importance of materiality, texture, and tactility in a time of rampant digitization. Current concerns with the importance of human hands, emotions and senses influence contemporary design thinking. The widespread, often counter-culturally expressed hope for radical change influence design visions during these times of social upheaval and economic predicaments. We hear echoes of romanticist design creativity, not only in such phenomena as critical design, shared economy projects, alternative economies, DIY, and various start-up experiments, which seem to gain new importance in design thinking, but also in popular trends of new medievalist and national romanticist derived aesthetics, cyborgism and spiritualism.

We conclude this historical narrative by suggesting that design thinking now again seems divided along the dichotomous axis described above. The empiricist ambitions of scientifically consistent design thinking continues to engage researchers and practitioners, but also a new romanticism, involving different understandings of materiality, subjectivity, cognition and creativity gains ground. How this new romantic trend will interact with the equally strong tendencies towards increased efficiency, demands for profit and (post)industrial rationalization remains to be seen.

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