THE "SMART" HOME
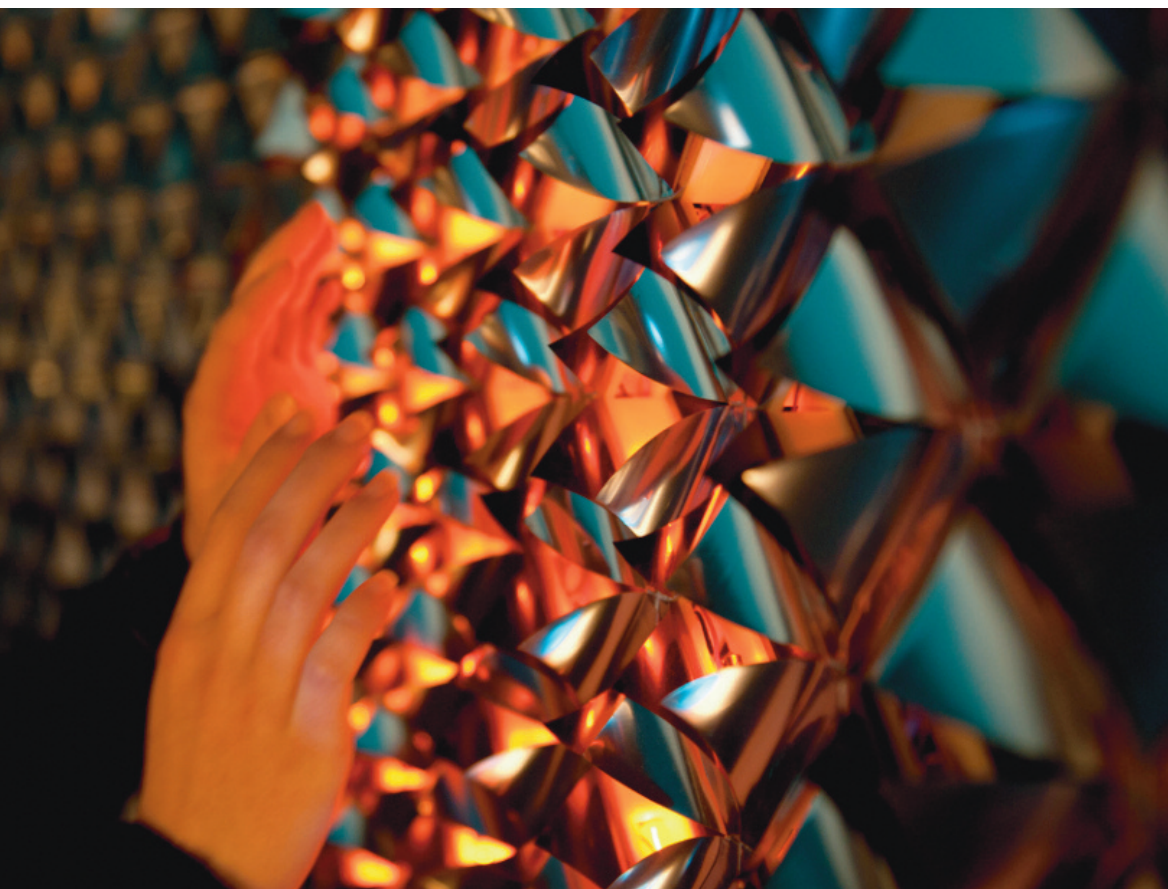
An exploration of how Media Technologies have influenced

Interior Design visions from the last century till today

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Cover image: Studio Roosegaarde, *Lotus 7.0*, a living wall made out of smart foils which fold open in response to human behavior, 2010-2011, Rotterdam, NL.
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Introduction
The Smart Home beyond *domotics*

Domotics is a term derived from the contraction of the Latin word *domus* (home) and the disciplines of informatics, telematics and robotics. With the advent of the mechanization era at the beginning of the 20th century "home automation" started to revolutionize domestic interiors with labor-saving machines, lighting, heating, ventilation and air conditioning systems that have been grown ever faster with the introduction of electric power distribution.

Even so, writing about the *Smart Home* implicates a deeper understanding of how technologies advent have modified (and will modify) our life and living spaces not only from a "domotical" prospective.

The passage from the mechanization era to the digital era is a critic step of our contemporary history. As technology changes so do society, the environment, and the practice of architecture and design. The globalizing "networked society" has forced architects and designers to readapt their work to new modalities of production and construction, new patterns of movement and settlement, new cultural priorities and new space and objects typologies that have radically changed our living environment (Lecce, 2014). As affirmed by William Braham and Jonathan Hale (2006): «Through the twentieth century philosophers

and historians have debated the nature of that relationship, leading in recent decades to a more nuanced view about their interaction and the degree to which technology itself is "socially constructed", or at least culturally embedded and coevolving».

Today everyday life flows over a background of a multitude of pictures and sounds, transmitted by millions of screens in a constant flux that could communicate endless quantities of information in a few minutes, also to all papers, journals, web sites, newsletters and blogs.

Paul Virilio, in his essay *The Third Interval* taken from the book *Open Sky* (1997), claims that the new technologies of "telepresence" have created a new category of experience, which transcends the limitations of the traditional concepts of space and time: «This new "interval" emerges from the illusion of simultaneity created by the latest digital communication technologies. The almost-instantaneous availability of "realtime" information challenges our conventional understanding of the experience of the here-and-now». At this point, there might be spontaneous questioning about: how new technologies changed, or will change the ways of inhabiting space, especially due to mutations of our customs? How interior spaces will evolve in the near future? How objects in our houses evolved in the last fifty years? What kind of technological approach could be more correct related to our contemporaneity?

Our objects landscape changes so quickly, and a new generation of objects is always ready to substitute the previous one: more elaborate computers transform all the computers built a few years before into obsolescent technology, the microwave oven takes the place of the home fireplace.

In his last book, *Chaosmosis* (1992), the French philosopher Félix Guattari insists that technology must be defined more broadly, that we must abandon the simplistic opposition between the technical and the natural – the distinction between the tool and its human operator. Instead we must try to grasp the "machinic" as a continuum of related elements, containing particular technical devices inseparably embedded within the vast networks of materials, processes, systems and infrastructure (both technical and sociopolitical) within which they must inevitably operate (Lecce, 2014).

What media means?

The specificity of media technologies lies in their focus on the communication of meaning. They are, to varying degrees, technologies of representation and communication, registration and distribution. Very different media technologies, ranging from speech and writing to the electronic media (including the internet), are clustered under this label, all with very different relationships to the material. But at the same time, these materials and the many proto-machines are arranged to enable their users to communicate through a variety of languages. These media arrangements are not merely mechanical, they are also organizational.

Media technologies are not only organizational (or social), but also cultural. This implies that media technologies are embedded in discursive environments that attribute meaning to the proto-machines, their uses (in the field of both production and consumption) and their place in society. These discourses are not necessarily stable, and can become constructed in a variety of ways. A similar logic applies to media consumption culture, where a variety of cultural processes, such as identity formation, distinction and domestication, impact on the way media technologies are consumed. Media technologies play an important role in everyday life, and their identities become articulated through these consumption processes, while they simultaneously contribute to the articulation of the identities of their users by offering them subject positions (Carpentier, 2011, pp. 271-272).

What *new* media means?

Internet, Web sites, Social Media, computer multimedia, computer games, smartphones, virtual reality, Internet of Things... Is this all new media is?

The popular definition of new media identifies it with the use of a computer for distribution and exhibition, rather than with production. Therefore, texts distributed on a computer (Web sites and electronic books) are considered to be new media; texts distributed on paper are not. Similarly, photographs which are put on a USB pen drive and

require a computer to view them are considered new media; the same photographs printed as a book are not.

Shall we accept this definition? If we want to understand the effects of computerization on culture as a whole, maybe it is too limiting. What is more likely is that just as the printing press in the fourteenth century and photography in the nineteenth century had a revolutionary impact on the development of modern society and culture, today we are in the middle of a new media revolution, the shift of all of our culture to computer-mediated forms of production, distribution and communication. This new revolution is arguably more profound than the previous ones.

The introduction of printing press affected only one stage of cultural communication – the distribution of media. In the case of photography, its introduction affected only one type of cultural communication – still images. In contrast, computer media revolution affects all stages of communication and all types of media – text, still images, moving images, sound, and spatial constructions. How shall we begin to map out the effects of this fundamental shift? (Manovich, 2002)

Bibliographical References

Braham W. W. and Hale J. A. (2006), *Rethinking Technology. A Reader in Architectural Theory*, Routledge, London.

Carpentier N. (2011), *Media and Participation: A Site of Ideological-democratic Struggle*, Intellect Books, Bristol.

Lecce C. (2014), "The Post-digital era: towards a relational and sustainable approach", *PAD Journal*, 12. Available from: http://www.padjournal.net/post-digital-era-towards-relational-sustainable-approach/.

Manovich L. (2002), *The language of new media*, The MIT Press, Cambridge.

Virilio P. (1997), *Open Sky*, (Rose J. trad.), Verso Books, New York.

Reading the History

During the 20th century, exhibition spaces, artistic installation and great Expo architectures often caught the *spirit of their time* (Morin, 1964), anticipating what would have happened few decades after. In this direction, the installations projects often functioned as critical-experimental spaces where new technologies could be applied and most of all be accepted by the public. Interiors soon became a crucial stage where it was possible to probe the most advanced ideas, so the most farsighted designers found fertile ground in the design of exhibitions and demonstrative pavilions.

Looking at the history of architecture and design of the last fifty years, this chapter tries to outline a timeline which shows the most significant tendencies that succeeded in relation to architecture, design and new technologies, following the pivotal passage from the mechanization era to the digital era: "The Architecture Machine" (1900-1938), "Postwar and Technological Futurism" (1939-1967), "Utopias and the Radical Vision" (1968-1980), "Techno-euphoria" (1981-2000). From this fascinating history is possible to extrapolate some "future visions", of critics, architects and artists, whose technological experimentations have brought meaningful changing in the history of the architectural project.

The Architecture Machine

Le Corbusier's definitions «The house is a device», «a house is a machine for living in» and «one can be proud of having a house as serviceable as a typewriter» (Le Corbusier, 1927, p. 241), well introduce *functionalism* as the dominant architectural theory of early 20th century Modern Movement.

The first rule of modernist theory was the "form-function" relation which principle is determinism, the idea that the actions of the user are predictable and every event has a cause: «Functionalism was one of the most alarming aspects of the early modernist agenda because its adherents had confidence in a 'science' that cannot be validated scientifically and believed that the user is passive, consistent and has universal needs» (Hill, 2006, pp. 16-17).

Exemplary case of this approach within domestic interiors were: the *Household Engineering: Scientific Management in the Home*, Christine Frederick's 1915 interpretation of Taylorism, and the 1927 Grete Schütte-Lihotzky's proposal for a scientific management of labour to design the mass-produced and standardized Frankfurt Kitchen for the city's social housing program.

Although these historical milestones are already well rooted in the history of interiors, there are other episodes among the same history that since the early twenties captured equally fundamental technical and social changings. It is the case of high sensible architects and artists coming from the avant-garde movements from all around the Europe who understood the growing influence of media technologies and communication on people and how they would change their way of life forever.

Exhibition as a Manifesto

At the turn of the twenties and thirties, both Walter Benjamin and Siegfried Kracauer, didn't considered distraction a limitation to social awareness, on the contrary a driving force able to enlighten and mobilize the masses. The film was intended as the newest means of distraction, because Benjamin suggested that a physical shock effect,

produced through constantly moving images, could induce more attention onto the public (Phillips, 2008).

At the same time avant-garde movements, like Dadaists and Surrealists, also used physical shock effects to induce a greater attention and promote social awareness through the visual arts. Likewise, Herbert Bayer identifies the spatial discoveries of the Stijl group and the Constructivists as a direct and fundamental influence in the development of a new exhibition discipline (Bayer, 1939-40).

The project of El Lissitzky for the Russian Pavilion of the Cologne Press in 1928, concerned the Soviet press, its working methods and means of expression, and in general the social life in the USSR, bringing back an impressive cross-section of it. El Lissitzky was the first to use Dadaist collages and giant cut-out photographs as spatial elements in exhibitions: «If on previous occasions, the viewer marching past the picture-wall was lulled…into a certain passivity, now our design should make the man active. This should be the purpose of the [exhibition] room» (El Lissitzky, 1968, p. 366).

It is the birth of a new storytelling tool, which reaches the public directly, which identifies perfectly with the technological innovations of the time and with the affirmation of journalism and the press as a means of mass communication. The particular type of display designed by El Lissitzky was further refined and perfected a few years later by Herbert Bayer, László Moholy-Nagy and Walter Gropius at the *Ausstellungsstand der Baugewerkschaften* (Building Trade Union Exhibition) in Berlin in 1931. The project fused Russian constructivism with the concepts of the New Vision movement – or *Neues Sehen* – which spread in the 1920s between Holland and Germany and aimed to shake the viewer of modern photography out of his usual complacency, using unexpected materials and highly dynamic contemporary subjects (Rocco, 2014). The aim was to create a dramatic and bold integration of photos, physical elements and information. Moholy-Nagy, who is responsible for the graphics and images of the Syndicate Exhibition, applies the New Vision criteria by selecting a wide variety of experimental images, including frames, montages, macrographs and angled effect images. Bayer, who shared New Vision's enthusiasm and constructivist multidirectional visualization concepts, incorporated his concept of the "all-seeing eye", an icon that for him indicated

the potential of expanding the visual field in an exhibition space (Bayer, 1939-40). The challenge of exhibiting immaterial content, of pure communicative and media impact, intended for a large audience, became a central theme for designers and artists in the post-war period, when control over the masses became fatally decisive.

Frederick Kiesler

The visionary Austrian architect Frederick Kiesler is a less known actor of this period, who belonged to that generation of artists and designers interested in the effects of time and motion on perception. In search of innovation, he approached an extensive research from a wide variety of sources in the arts, humanities and natural sciences, contradicting the normative modern ideology and technology of his time.

In 1926 he declared «The Theater is Dead» at the presentation of the International Theater Exposition held in New York City in 1926 (Kiesler, 1926, p. 5). What he claimed was that moving images had now supplanted the need for traditional scenic techniques of representation. The proscenium stage with a static relationship between actor and spectator was now obsolete.

Time was ripe for what Kiesler called «the elastic space for freedom of movement» (Kiesler, 1926, p. 18). These radical statements by Kiesler were the basis of the *Endless Theater* project. His theatre incorporated several open suspended platforms with elastic cables enclosed in a double glass matrix and glass spheroid-shaped structure on which images and films could be projected. The theatre was to be built without columns using tension shell constructions, so that the interaction between actors and spectators could circulate freely, almost automatically along spiral ramps and stairs.

Kiesler presented an innovative mobile and flexible architecture designed to contract and expand in response to the drama of the event: the movement of the crowd. Inspired by constructivism, expressionism, dada, Stijl and futurism, Kiesler's *Endless Theater* incorporated several multimedia practices with a unique synthetic resolution. If original in concept, however, the Endless Theater appeared surprisingly undeveloped in its perception. Its structure suggested infinity

through continuity without significant formal, programmatic, techno-logical or site research.

In 1933 Kiesler would then transfer the same principles into the de-sign of the full-scale prototype of the Space House for the Modernage Furniture Company in New York, a project of an exhibition-advertis-ing nature that attracted a lot of attention and presented Kiesler's inno-vative structural principle of building a house with a continuous shell, a sort of organic "cocoon", a concept that anticipated many decades of what we today call an "intelligent" skin capable of responding to the needs and moods of those who live there (Kiesler, 1966). According to Stephen John Phillips (2008), although marginalized as an architect in his time, Kiesler, with his projects, advanced alternative modern dwelling practices that proved to precede 21st century digital design interests.

The *Space House* engaged the body physically tactilely, and its form took shape in correlation to varied use. Touch and vision were essential to the dynamic function of the house (Kiesler, 1934). Kiesler recognized materials have "psycho-functions" that can be utilized to stimulate the psyche.

Strict definition of human needs is the key question of architecture. Without defi-nition of fundamental needs there can be only conglomerations of steel, stone, glass, and plastics, any excrement of industry not architecture. The discrepancy between what people really need and prostituted needs is the measure between natural growth of tooling and artificially speeded-up technology. There can be no equal absorption of the insinuated express service of such tooling, since the pace of human acceptance is retarded by a natural resistance to change under pressure. No mysticism here, just mastery of a situation. The question is: if I AM and not if I.B.M. (Kiesler, 1996)

In his *Laboratory of Design Correlation* at Columbia University (1937-1941) Kiesler researched mobile and flexible structures along-side illusory environments to challenge the limits of static building structures. Continuous form he believed facilitated fluid human ac-tions that ideally contributed to more productive lives:

One of the chief aims of our Laboratory is to learn to see everyday happenings with a fresh keen eye and to develop by that a more and more critical sense for our environment. Critical study of everyday life was important to Kiesler. As architec-ture engages our habits – our automatic actions – it creates environments which af-

fect everyday life. By challenging perceptions of daily habits, Kiesler hoped to gain new insights into designs for familiar habitual activities. He proposed to study the dialectical relationship between man and the environment, which he described as – biotechnique – the study of "the interrelation of a body to its environment: spiritual, physical, social (and) mechanical". (Kiesler, 1934, p. 292)

Few years later, in 1947, Kiesler introduced his concept of an *Endless House* while completing the *Halls of Superstition*, the Surrealist exhibition he held in Paris at the Gallery Maeght. Kiesler's interest in continuity and the "endless" discourse found its conclusion in this last prototype. In the *Endless House* all ends meet, and meet continuously.

> It is endless like the human body – there is no beginning and no end to it. The "Endless" is rather sensuous, more like the female body in contrast to sharp-angled male architecture. […] Space in the "Endless House" is continuous. All living areas can be unified into a single continuum. But do not fear that one cannot find seclusion in the "Endless". Each and everyone of the space-nuclei can be separated from the totality of the dwelling, secluded. At will, you can reunify to meet various needs: the congregation of the family, of visitors from the outer world, neighbors, friends, strollers. Or again, you'll womb yourself into happy solitude. […] In the "Endless House" nothing can be taken for granted, either of the house itself, the floor, walls, ceiling, the coming of people or of light, the air with its warmth or coolness. Every mechanical device must remain an event and constitute the inspiration for a specific ritual. […] What is called "emotional architecture" is nothing but architecture as opposed to just "buildings". (Kiesler, 1966, n.d.)

Kiesler designed the model of his *Endless House* from a solid egg shape and then stretched out areas to constitute spaces directly carving them from the solid. Than he created orifices and protrusions that constituted potential skylight, door, and windows. Kiesler's inspiration to prehistoric cultures rises strongly in this model, equally to the reference at the structures of animal shelters. In this sense, his idea of re-naturalize modern building practice was getting stronger as his uncanny regression into primitivism let him design this kind of "nest building" (Philips, 2008). "Man's house-building is nothing else but Animal-Architecture" (Kiesler, 1966, n.d.).
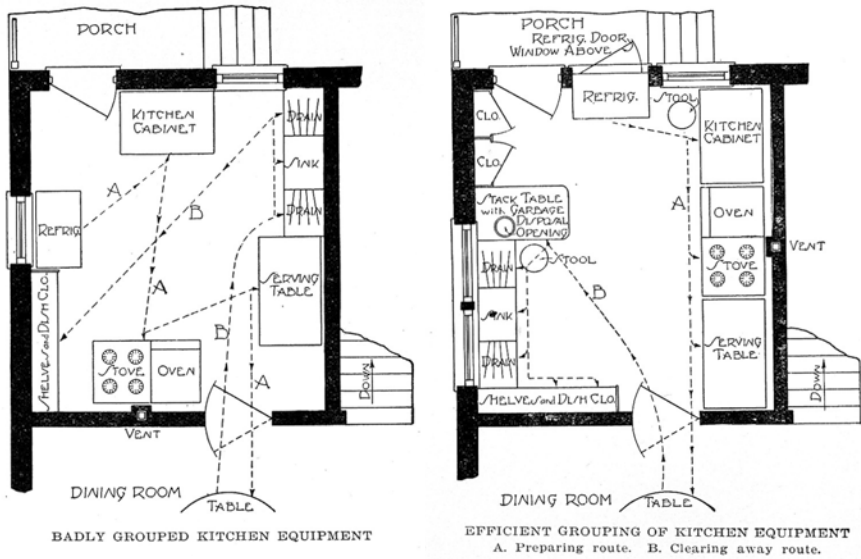
Fig. 1 - Christine Frederick, Household Engineering: Scientific Management in the Home, Chicago, 1915. Available via license: CC BY-SA 4.0.

Fig. 2 - Brinkman and Van der Vlugt, Dutch functionalist kitchen, Huis Sonneveld, Rotterdam, 1933. Credits: Rob Oo. Available via license: CC BY 2.0.

Fig. 3 - El Lissitzky, drawing exposed at the Raum Konstruktive Kunst (Room for constructivist art) in Dresden, 1925. Credits: Russian Constructivism (https://www.flickr.com/photos/102989169@N03/). Available via license: CC BY 2.0.

Postwar and Technological Futurism

Future visions about home interiors have been often proposed along the modern history. In particular world's expos became a show-case of technological progress, represented in pavilions and showed to millions of people through astonishing exhibitions of modernity and futuristic landscapes. Certainly one of the most representing in this mission has been the New York World's Fair of 1939, recalling with its headline: *Building The World of Tomorrow*.

To its visitors the Fair will said: «Here are the materials, ideas, and forces at work in our world. These are the tools with which the World of Tomorrow must be made. They are all interesting and much effort has been expended to lay them before you in an interesting way. Familiarity with today is the best preparation for the future» (Monaghan, 1939, n.d.). From its inception to its closing ceremonies, the Fair promoted one of the last great meta-narratives of the "Machine Age".

The Fair's true emphasis was on inventions, forms and especially new products. For this reason, several leading industrial designer of the time were brought in to exalt the positive power of industry, with which would make life in the very near future better through a generous and phantasmagorical promise of prosperity (like the "television-telephone" prototype by General Motors Research's stage). Another theme of the fair was the emerging new middle class, leading a hoped-for recovery from the Great Depression. The fair promoted the *Middleton Family* that accommodated new products manufactured to make life easier and affordable, such as the new automatic dishwasher and *Elecktro*, a two meters tall walking, talking robot.

Among others, the Transportation Zone pavilions attracted wide-spread attention. Perhaps the most popular was the General Motors Pavilion with its 3.300 square meters *Futurama* exhibit, designed by famed industrial designer and theater set designer Norman Bel Geddes. *Futurama* transported fair visitors over a huge diorama of a section of the United States that was designed with a stunning array of miniature highways, towns, 500.000 individually designed homes, 50.000 miniature vehicles, waterways, and a million miniature trees of diverse species. These elements of the diorama gradually became larger as the visitors (who were seated in moving chairs overhead) moved through