Method

Method

Method

The range of applicability of the method should not be restricted to a determined area of design, but to illustrate the evolution key on evolution of Design, there were chosen three Design fields. The intent of this chapter is to give examples of applicability of the model, so that all the phenomena described in the last chapter become easier to link with real case scenarios. Most of the examples given in the Simple Phenomena Section are not absolutely pure, in other words, a case of cultural expansion might have characteristics of division, and fusion, as well as an important functional component related to the phenomenon. The idea here is to exemplify real life phenomena, isolating one aspect of an evolutionary event.

The role of evolutionary components on design

Even though all three components are variables in every step on design's evolution, some areas have a leading component, according to characteristics of the development process of each case. The first of them, Product Design, is probably the most functional based design area.
Although the technological advances sped up production process giving product design an very reduced lifecycle and a more cultural aspect, the design of products is still primarily functional based. The second one, communication design (a.k.a. graphic design), works in the most ephemeron and volatile way, emotional and aesthetical, it is primarily guided by the cultural component.
The third area is what we called Informatics product Design, an area based fundamentally on the technological component, fetches characteristics of both Product and Graphic Design and evolves right in the edge between ethereal and real.

Method

Product Design

It was stated, in the beginning of this paper, a larger definition of the role of design as the transversal discipline through which every human creation and invention gets shape, and a larger definition of simple objects and artifacts as primitive forms of machines.

Once these concepts are embraced, it seems more clear the role and placement of Product Design in the evolutionary chain. Although it received a proper name in a very late stage of human society, the design of products (as the earliest forms of organic matter that preceded life), existed in an anonymous form since the dawn of humanity.

The early gradual stages of the development of the idea of product are so ancient that the whole humanity dating system is based on it. Function is in the basis of the concept of making and using physical products.

In the post-industrialization period, there appeared a tendency for products to become increasingly aesthetical, more embedded with cultural aspects. Nowadays, products are released and discontinued in a speed compared to fashion standards. Some of the reasons are the increase of the velocity of production and the decrease of cost on prototyping and designing processes. This trend is clearly stronger in the design of low-tech products, such as furniture, decoration, electrical and simple electric/electronic devices, such as calculators, watches, hair dryers etc. Once the technologies are already standardized and the engineering limits are under control, there is more space for aesthetic creativity.

By its deep capacity to transmit social and cultural information, product design accumulated social functions. In the pre-industrialization era, artisanship focused on embed products with artistic and status value, following aesthetic and artistic movements such as Baroque, Classic and Neoclassic, but yet, the functional component of design plays a more important role, the proof is that among the most recognized icons of Design, few projects prescind functional innovation (Phaidon Design Classics, 2006). Products with aesthetical characteristics not grounded on a function or

functionality improvement, as species that present no evolutionary advantage, succumb. In these times, product design is so omnipresent that it becomes almost imperceptible, From plumbing, to electric energy, refrigerator and furniture, physical products are still the motor of human evolution.

Communication Design

The cultural character of communication design (formerly known as Graphic Design is associated to its traditional relationship with art and the aesthetic movements. After the slow and analogical evolution of press and the reproducibility of the image, Communication Design followed basically every aesthetic period, from Art Nouveau, Art Deco, Streamline, futurism till the end of the 20th century aesthetics.

Some attempts to rationalize Communication Design happened in the modernism era, a period in which a whole set of rules and dogmas involving balance, symmetry, color, relation figure-ground and composition was established. It took few years for the postmodernists to reduce all that theory into crumbs. The reason is simple, the dominant component of Graphic Design is Culture.

Communication Design's unique state of acting in the border that separates existence and representation is the key for this cultural aspect. The recent development of computer graphics gives us a fresh example of that phenomenon, a tricky condition that transformed all the non physical information in a semi-fiction.

Specially after this mentioned development of computer graphics, there are no physical restrictions or limitations for Graphic Design what so ever. Its functionality is indelibly deformed by this fact. As in Product Design, as the technological component retraces the technical limits of a discipline, the cultural component manifests at its most.

Method

Informatics Design

The most important evolutionary event of the beginning of the 21st century is one of the most appropriate case studies of this paper, primarily because it reunites areas of design that have always been separated: Industrial Design and Communication Design, secondly because it's the best example of the immateriality of design, once the informatics design has not a particular technological element that drives all the phenomena or a product that guided all the process. The technologies that allow the evolution of this area are in development constantly, in many cases they are not cumulative, or rather, they don't necessarily overlap each other or enhance gradually from a first primordial breakthrough invention, some discoveries and technologies come as a result of pure research, they just pursue a master plan, a paradigm, and that fact gives us an important example of a completely intentional, non-incidental evolution.

This final scope is deeply connected to the overall goal of human evolution, the full comprehension of past, future, man's surroundings, the development, management and development of information and the creation of a system that communicates autonomously. All the products that compound this segment follow these goals. From surveillance cameras, the digital cataloging of written material, the miniaturization of devices, the development of telescopes, space probes, satellites and so on, converge to this full comprehension of existence.

The development of digital autonomy and consciousness has been sought as the next great technological milestone of the 21st century. What is called as web 3.0 is nothing less than the development of a computational system capable of understanding information, not just storing and computing it, like looking for a person and finding a piece of footage with the person in it, even if no one ever wrote down anywhere that that person was filmed in that particular moment. All those technologies are based in the principle of informatics as a means for evolution. In the same way DNA and RNA allowed

Method

the establishment of the first forms of life (reproducibility and ability to carry genetic information), the communication product design (informatics, the binary code, the artificial intelligence etc.) scattered and triggered the development of a reproducible language.

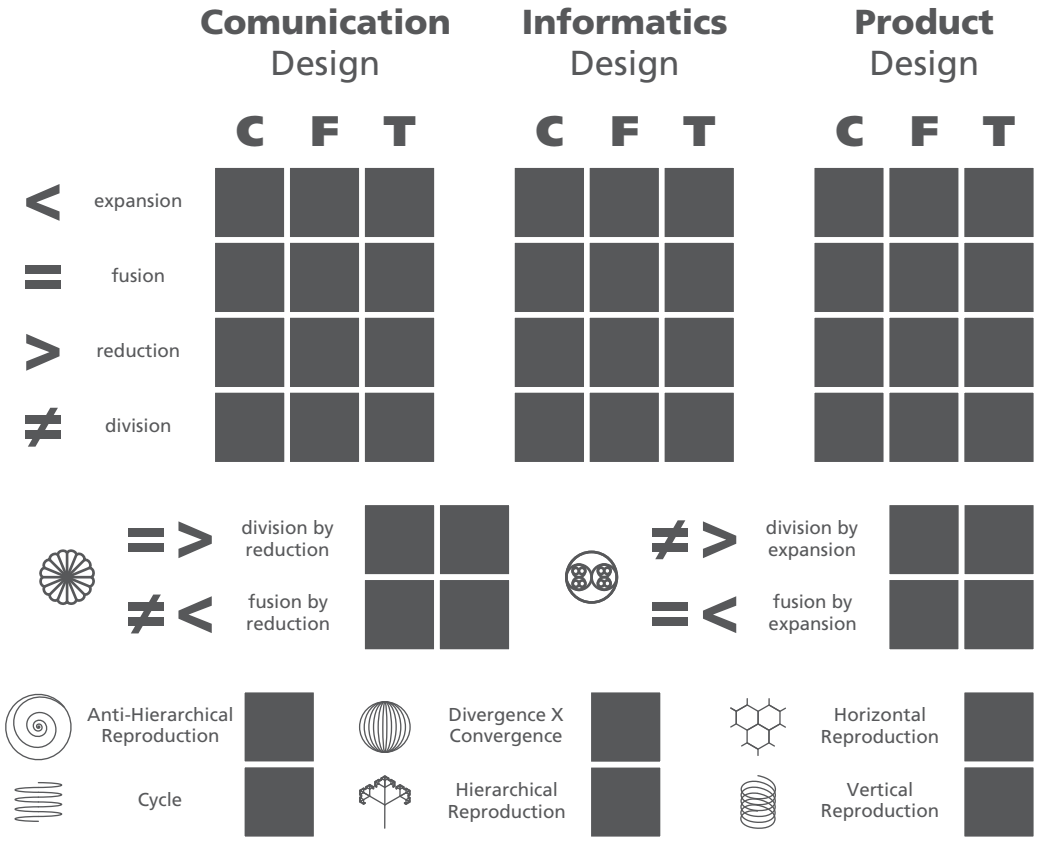
This comparison goes beyond a philosophical analogy. Notwithstanding the fact that the binary code grew in complexity over the years, the language unity, the "alphabet" remained unaltered since the first processors designed. It's an indivisible unity of communication language just like the DNA and RNA, and every informatics product is build and communicates this way.

This unification of information language is probably the key for the overlapping of technological information, which will allow ultimately the creation of an autonomously driven system, "the machine kingdom"

Method

Method for synthesis

The presentation of illustrative examples of the fundamental phenomena combine the three axes of our inquiry on design evolution, or rather, the basic phenomena (fusion / division and expansion / reduction), the three components susceptible to these evolutionary phenomena (functional component, technological component and cultural component) and our three areas of inquiry (communication design, product design and informatics design).
In the later exemplification of more complex phenomena the number of axes is reduced following the natural complexity of those phenomena and the increasing number of variables involved.



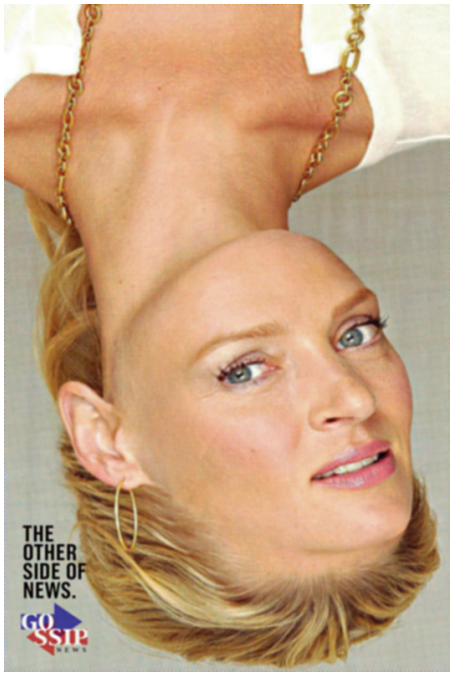
Method

Communication design

Functional expansion

The photo montage in advertising

With the advent of computer graphics softwares, the language of art direction of advertising suffered an enormous mutation. Before this event a good advertising would be a good well produced picture with a smart punch line, after that, even the exigencies of the market, consumers and clients changed, the layout and the visual component of the advertising became as important as the copywriting, sometimes prescinding completely any textual information. The possibility of altering reality through photo montage, to pass a massage became a standard in advertising, especially in press media



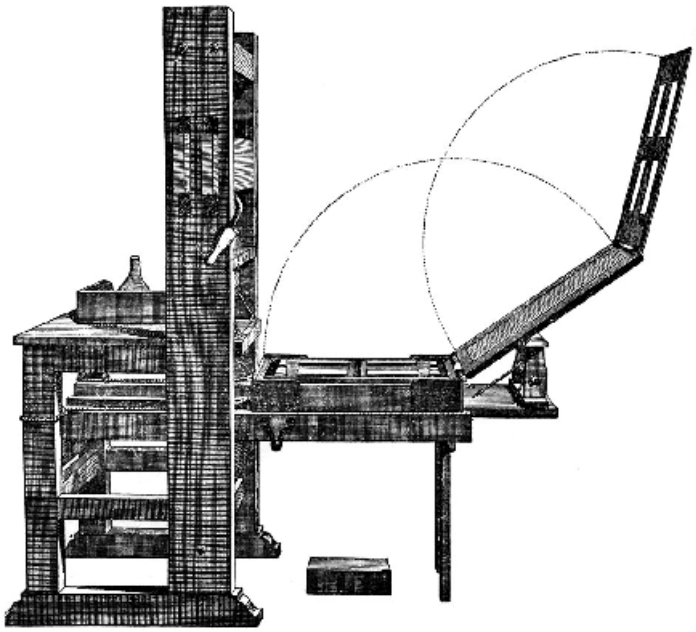
Soul Fast Advertising, Uruguay
Creative Director: Marcel Colera

George Patterson Y&R, Melbourne, Australia
Creative Director: Ben Coulson

Method

Technological expansion
Printing with movable types

The development of the press with movable types by Guttenberg represented the passage from artisanship to mass production in printing. Letters, that before that advent would be carved individually in every printing cast, restricted by impreciseness such as the artisan's skill, calligraphy, and speed, could now follow a technical rules, would be designed in a certain way and printed in a regular format. The development of typefaces, periodicals, increase on the number of publications, the alphabetization and every other development from the functional and cultural perspective was a consequence of that technological event.

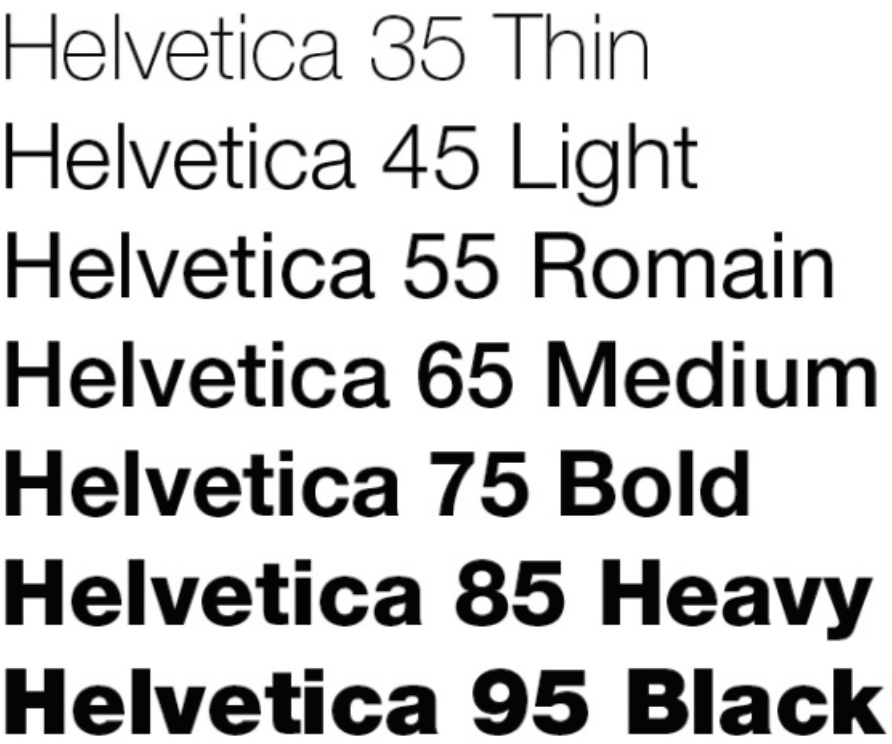


Guttemberg's first movable types' press
lithographic illustration

Method

Cultural expansion
The advent of Helvetica

The design of Helvetica represented a cultural breakthrough in graphical design. At the end of the excessive and kitsch era of Norman Rockwell-ish photorealistic illustrations, handwritten fonts and splashed signs, Helvetica brought simplicity, cleanness, minimalism and rationalism to graphic design. A Revolution fueled by all the design theories and art influences developed at the beginning of the twentieth century and transported to design through that specific design.



Helvetica Font Family

Method

Functional reduction
Decal letters

Decal letters of various typefaces were used professionally on the production of printing layouts. It was the only possible method to reproduce copy in larger scales and with unusual typefaces, as in printed advertizing titles and logotypes. After the advent of the first computer graphics softwares, the use of decal letters decreased till it's complete discontinuity.

Decal font sheet

Method

Technological reduction
flyer-postcard mailer:

The flyer, a medium mostly used to publicize events and advertising campaigns suffered a standardization process unleashed by the expansion of the distribution channel in bars, restaurants and cafes. This standardization is represented by the unification of the flyer format and support materials to adapt to the postcard like display. The flyer that was historically an informal unofficial medium, after the expansion of the official distribution media, narrowed to a single standard format

Advertising postcard display

Method

Cultural reduction
art nouveau in advertising paper and packaging design.

The Art Nouveau language that was a dominant aesthetic not just in product design but also in graphic, packaging design and advertising achieved its natural exhaustion point in the end of the 1910's. The oscillation between the organic and emotional character of that language and the minimalism and rationality of the following movements would be still repeated other times in the future, elements of Art Nouveau would reappear later but with the exhaustion of that movement, there was a fertile land for the popularization of non organic and minimal aesthetics like Art Deco and De Stijl, movements that were antagonistic to Art Nouveau

Mucha, Papier a Cigarettes (Job ad) 1896

Berhnard, American Tour

Method

Functional fusion
paper and digital visual communication

The expansion of the digital media, that started aesthetically limited by many technical issues, like image resolution, typeface variety and color gamut, soon developed its own language. The technical problems gradually solved led the digital design language to develop potentialities based on its functional attributes, the information display, icons, controls etc. The pixel, the button, the cursor, the virtual materiality of semi transparent shinny glass like surfaces became a graphic language. In the other hand, elements of printed design, also originated on the functional and technical aspects of that medium promoted the development of the printed graphic language, some elements became deeply associated with that process and became styles, like the bleeding marks, the halftone, the paper texture, the unmatching color overlap, the ink etc. Eventually, due to the expansion of design's technical possibilities, it became possible to emulate the aspect of one medium into the other, those languages merged, Nowadays it is common to find elements of printed language on digital design or elements of digital language in printed materials, and sometimes, elements of those two languages in the same layout.

http://www.dawghousedesignstudio.com/

Method

Technological fusion
Adobe Creative Suite

In the dawn of computer graphics, many companies adventured on the design of graphic softwares. Many years, bankruptcies, plagiarisms and fusions later, a process similar to a natural selection led all the softwares to merge into a few creative packs. Adobe, after buying Macromedia emerged as the victor of the software war, becoming the monopoly of mainstream graphic design. A few concurrents remain resilient focusing on specific markets, as semi amateur users or the cinema industry, but the methods, technologies, file formats and languages fused into one, shared by all Adobe softwares.

Adobe Cs5 Master Collection box

Method

Cultural fusion
PopArt

Pop Art was an artistic movement inspired and fueled by mass culture, advertising and design. It explored the reproducibility and meaninglessness of those languages as an aesthetic. The result was the creation of a very iconic artistic language that became bigger than the inspiration itself. Eventually, designers and admen started get inspiration from that aesthetics in the design of packaging, advertisings and logos. Art imitated Advertising and eventually Advertising started imitating Art, the resulting language was not either design or art, it was a fusion of both.

GM Corsa promotion online poster
inspired on the works of Andy Warhol

Converse AII Starinspired on
the works of Roy Lichtenstein

Method

Functional division
Book / Art Book

Along with the development of printing industry, there was a development of the range of functionalities of the printed paper. The book that was a media format used exclusively for the publication of romances and text books spread into a number of different kinds of books with different functions and functionalities. The Art book, in general large and heavy, with beautiful high quality prints of paintings and sculptures became a book not to be read, but to flip through aimlessly or to decorate a coffee table. The Design Book was another functionality variation, being used to inspire and provide aesthetic references to designers and art directors. The functionality shift happened when all the physical characteristics of the product got adapted to that function. An Art Book is not supposed to be read, it's too heavy and large to carry around, the copy is little, irrelevant and printed in a illegible and small typeface. The Design Book aften doesn't even have copy or an index, it's just a series of images grouped with a common theme, flyers, letterhead and logo, disc covers, icons, etc.

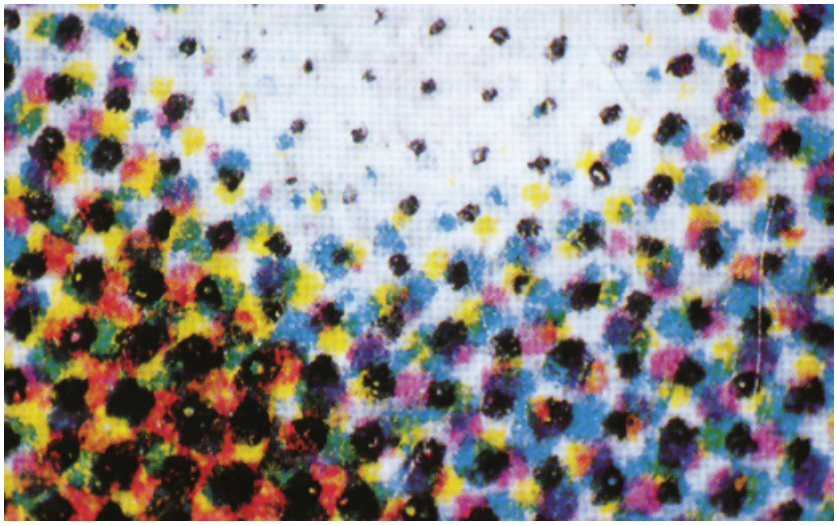
The Phaidon Atlas of 21st Century Architecture
Book + the plastic case: 7,5 Kg

Phaidon's 1000 Design Classics
3 books + plastic frame: 9,9 Kg

Method

Technological division
digital printing

The press industry split the technological tendencies. In one hand there is the development of the mass production printing, with low unitary cost in large scale and fast printing rate, in the other, the development of the digital printing, a more customizable, partially manually managed, small scale modality. The technologies and techniques involved in those two printing processes are completely different. The first one requires the casting of print cylinders, the installation of a big structure aiming in the printing of thousands of copies. The second type has a faster preparation time, no cylinder, a smaller structure and permits the printing of a very small number of copies.

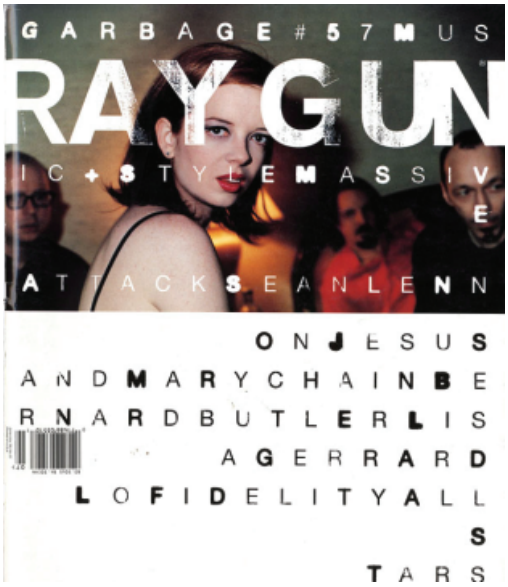


Traditional offset print at the microscope

Method

Cultural division
division among the modernist design and non-canonical design.

After the definition of a set of dogmas and a theory of the good form of Design, all the industry was developed over the establishment of order, symmetry, balance, harmony etc. Later David Carson, Neville Brody and other Designers came up with a reactionary movement proposing unbalance, illegibility, lack of harmony and basically the destruction of all those modernist dogmas and rules. The movement had a great importance on design, but didn't eliminate the rationalized conservative design. It introduced a conceptual division, Design for conservative people and design for progressive liberal people, Right, and Left, old and young, neutral and organized, radical and expressive. This event divided for the first time design's communication in terms of public.



Raygun magazine cover, # 57
Post Modern

Eagle Eye Movie Poster
Canonic

Method

Product Design

Functional expansion
Olivetti portable typewriter

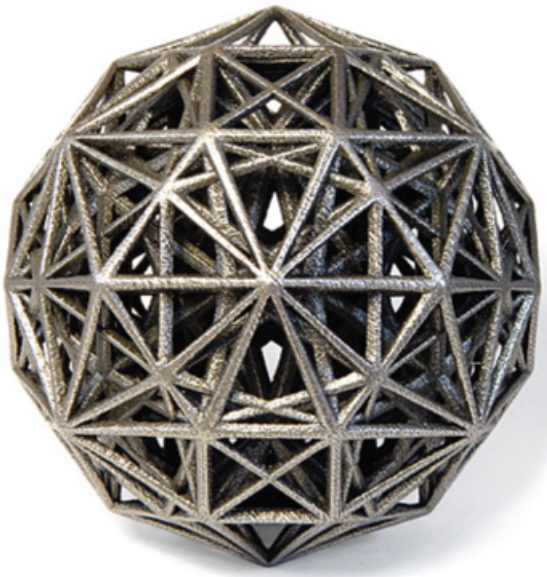
The advent of the portable typewriter gave students and professionals the possibility to write and print documents instantaneously anywhere and created the possibility of writing at home, on vacation, in a bar or a café, places where it would be close to impossible to do, with the previous big heavy typewriters. It became the equivalent to the laptop of the sixties and seventies. The possibility of professional printing at hand created a new demand and subsequently a new function that later would be fulfilled with the notebook.

Olivetti Lettera 92 typewriter

Method

Technological expansion
Metal tridimensional printing

The standard of the metal industry for the manufacture of complex shaped objects used to be the manufacture of a series of casting parts, joined and filled with liquid metal. That was a slow, difficult and expensive process and the only possibility to produce metal pieces with internal hollows and complex parts. The invention of the tridimensional metal printing, which combines a series of electronically guided processes such as printing of resin over metal powder in thin layers followed by the fusion of the metal in a furnace allowed a less expensive and faster production of many metal objects but also the production of objects that couldn't be manufactured before.



Metal printed object

Method

Cultural expansion
assemble of furniture at home (DIY):

The was phenomenon triggered by the bricolage movement and by the high cost of transport and professional technical assemble. In the beginning, there was a negative association of those products with cheap, low quality and poorly designed furniture. Furniture megastores like Ikea popularized the DIY (do it yourself) with minimalistic medium quality, well designed products and a low shelf price.

Ikea catalogue Ad

Method

Functional reduction
bathtub:

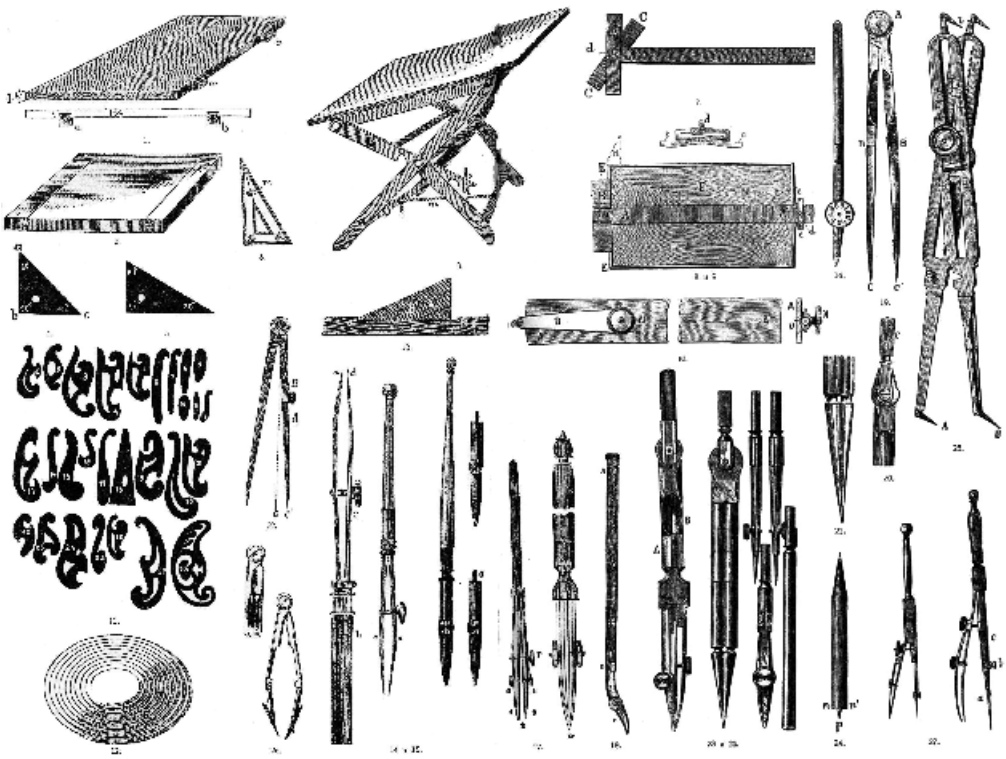
The popularization of the heated shower provoked a reduction on the use of its precedent product. The bathtub culturally survived for some decades after the invention of water heating devices such as gas boilers and electric resistance showers. But once water didn't have to be heated manually and would come heated directly from the plumbing, the functionality of the bathtub ceded to the convenience of the shower.

Bathtub

Method

Technological reduction
Tools for technical drawing

Till a few decades ago, the industry standard for the production of blueprints and technical drawings was designing them manually. Over centuries of architecture, engineering and design development, there has been created a huge amount of precision drawing and measuring tools such as T-squares, French ruler, measures protractors etc,. Nowadays, the development of this market is not just stagnated, most of the products are discontinued.



Bathtub

Method

Cultural reduction

Hat

The use of hats in external environments was not just a protective and fashion habitude, it was a social standard. The basic idea of covering the head was highly recommended, either with a scarf or a hat. No technological or functional phenomenon occurred, but yet, for purely cultural reasons, social hats stopped being used, unless for specific purposes, extreme cold (bonnet), extreme sunlight exposure (cap), uniform identification (policeman's hat) etc.

Bathtub

Method

Functional fusion
Sofa-bed

The increasing number of single and divorced adults, the decreasing amount of space available in city centers and the high coast of houses and apartments triggered the advent of studios, lofts and SoHos. This functional demand merged, in many homes, the living room and the bedroom. The fusion of the furniture was a consequence of that event. The technical methods through which sofas and beds became one vary from collapsible to foldable, functionality ruled the fusion.

Mobelform's Doc

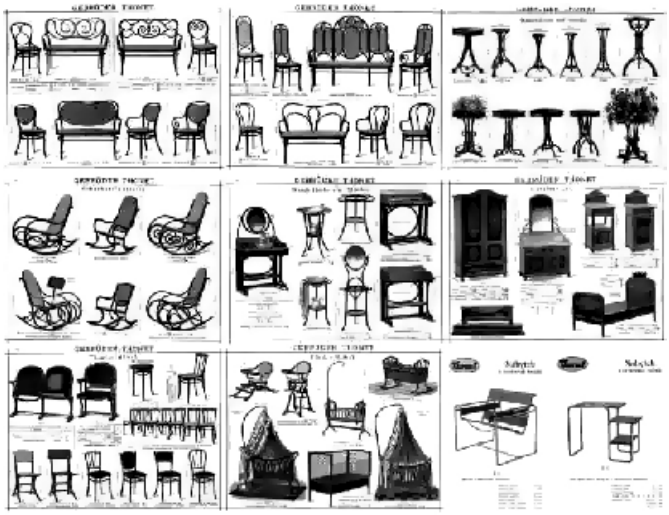
Method

Technological fusion

Michael Thonet's technology for wood curving

Thonet's breakthrough was his success in having light, strong wood bent into curved shapes by forming the wood in hot steam. This enabled him to design entirely new, elegant, lightweight, durable furniture, which matched perfectly with the design trends of the early 18th century. The Chair N * 14 of Michael Thonet is the movement's most iconic project. The method has profoundly influenced the design of that time, driving most furniture manufacturers to align to that style and the curved wood to become an aesthetic symbol of that period

Thonet's #14 Chair



Thonet's curved wood product catalogue

Method

Cultural fusion
Flatware set

The old cuisine and fancy aristocratic etiquette preached long complicated rituals in social occasions as meals, dances and reunions. There was a sort of implicit elegance in the complex procedures that involved eating. That elitist need for differentiation would immediately exclude less informed or cultured people that wouldn't be able to comprehend the sequence of use of the innumerous glasses, forks, knives and spoons. The aristocracy still exists but the rituals became somehow pointless. The sophisticated flatware would be fused into fewer more neutral elements, maybe designed, signed and branded by a famous designer, but no longer complicated and voluptuous.

traditional complete flatware set

Method

Functional division
flat / triangular Screwdrivers

The necessity to prevent kids to open dangerous electric or electronic devices led engineers to develop a screw driver and bolts with a triangular shape. That new format that prevented children to unscrew a bolt with a knife was introduced in toys and videogames notwithstanding the loss in practicality represented by the need for a new set of tools. That split on bolt and screwdriver design meant that the normal bolts would still be manufactured for products in general and that the triangular bolts would be just used for toys.

triangular headed bolt in the foot of a monkey doll

Method

Technological Division
disposable plastic products:

The invention of plastic and the development of very inexpensive low quality plastic production with high space saving, pilling and storing proprieties created the possibility for a whole new category of products derived from traditional tableware, the disposable tableware such as cups, plates, knifes and forks were a genre of product that could not exist or be conceived before the invention of the plastic and the standardization of its manufacturing.

plastic disposable cup

Method

Cultural division
Industrial Style:

A potentially aesthetical aspect always denied by designers, artisans and artists was the use of construction components and forms as a style. This aesthetic design trend emphasizes sharp lines, abrupt connections and dynamic interactions of motion, proposes grids, pipes, springs, rivets and gears as inspirations deriving from the same considerations that created the architectural movement Deconstructivism. In the Industrial Style, each piece maintains its internal logic and the connections among them are pronounced and clear. This concept differed completely from the traditional view of design where all the parts are subjected to the shape of the whole. It stuck a fork in the design's evolutionary line, creating this two opposing paradigms, revealing or hiding the constructive aspects, the whole versus the composition of elements.

Industrial style Interior design

Method

Informatics Design

Functional expansion
telephone:

In the dawn of telecommunications, a few technological innovations set off a whole new range of functional possibilities. The telephone that from the technical perspective, used the same technological methods and systems radio transmission had, started and spread this new functionality in urban areas and took not much time to become a standard. Few late technical innovations such as the direct dialing helped its expansion, but the importance of the phenomenon remains connected to the ascendance of the communicative function. The worldwide network of compatible communication system was later the foundation for the internet phenomenon.

Ericsson bakelite Swedish Type telephone, 1930

Method

Technological expansion
Digital camera

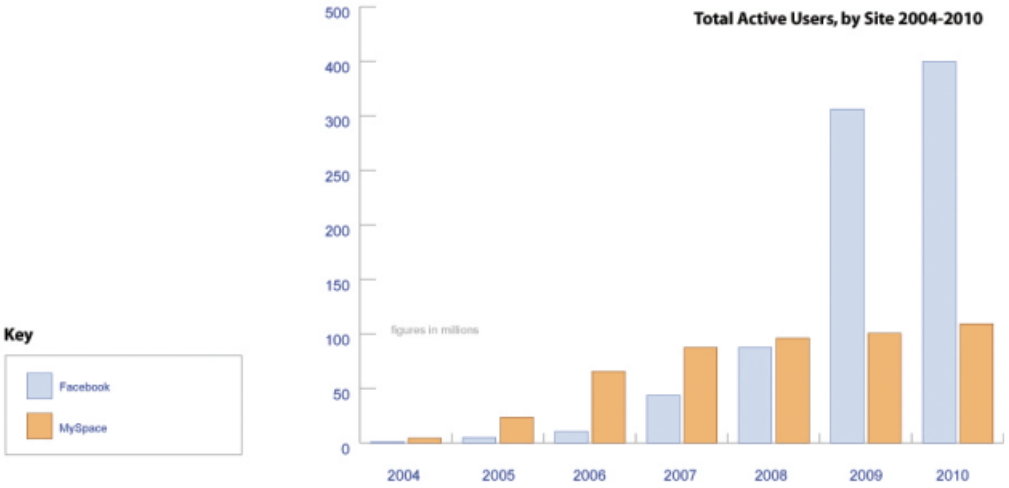
The technological discovery that made possible electronic light capturing unrolled the development of a new model in the photography and film industry. From the practical point of view, it made possible to shoot countless pictures, see instantaneously the result of them and store them digitally with no material support. It changed the way of shooting pictures and filming, but also allowed the function to be performed in ways never conceivable before, like from a cell phones or from a web cams, increasing the functional and cultural development through a technological advance.

Casio S600

Method

Cultural expansion
social network

The social network phenomenon is a manifestation of the Web 2.0 trend. It represents the democratization of the development of content and the participation of the common user on the development of the web. The cultural component pushed the creation and the development of the phenomenon, since primitive unofficial social networks were functioning for a while when the first websites dedicated to that service were created. The later development of the product follows the model most of the other breakthrough inventions take. The contemporary rise of a huge diversity of similar individuals and the force of natural selection, competition, fusions, and the survival of the most powerful or more adapted.



Facebook and Myspace's average daily visitors since 2004

Method

Functional reduction
beeper:

This is a rare case of a pure functional reduction. The functionality and proprieties of a beeper were never completely fulfilled by the cell phone, once cell phone batteries last for a very reduced amount of time compared to beepers, or rather, are often out of charge, and the connection is subjected to signal limitations, but this new product, even inefficient in the performance of some tasks, offered a better overall set of functionalities. The almost everlasting functioning of the beeper system is still indispensable in specific cases, like doctor emergency notifications.

New York City Motorola radio pager, 1978

Method

Technological reduction
answering machine

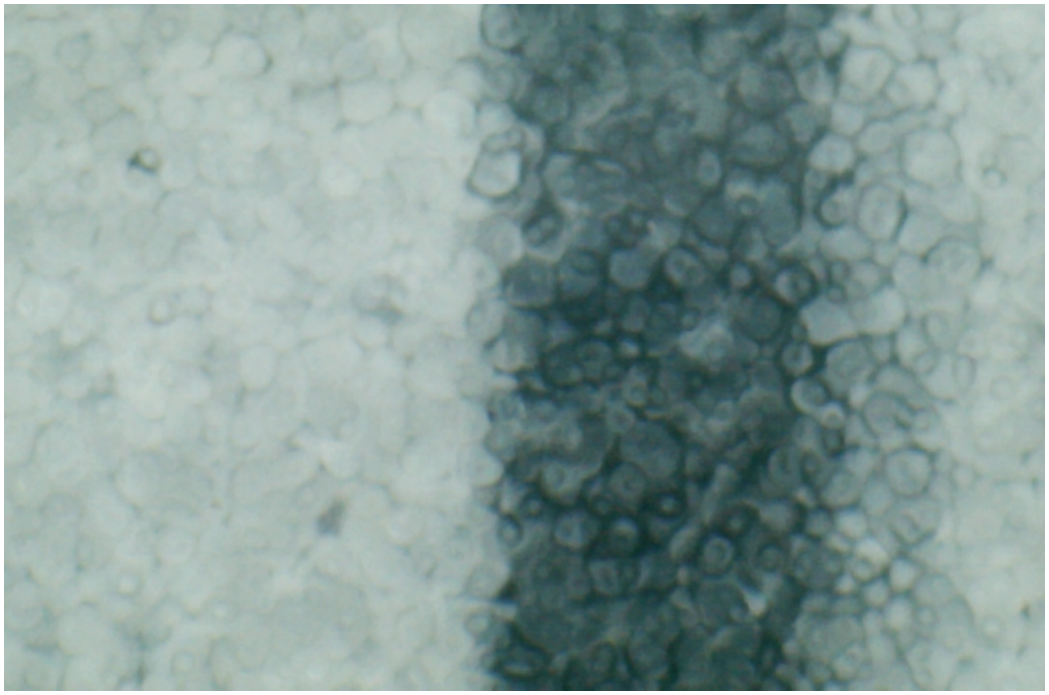
The landlines, as the only telecommunication devices till mid 70's had a range of secondary complementary technologies, like answering machines, beepers, call redirecting services etc. The answering machine is one of those products that lost relevance over time, due to the popularization of more efficient technologies such as the cell phone, the digital wireless communication systems (Nextel) etc.

Radio Shack Digital Answering Machine

Method

Cultural reduction
E-Book

The development of the magnetic electronic paper applied into the E-Book readers represents an aesthetical restriction on book design, meaning that all electronic version of books must adapt to the electronic book format, or rather, pre-established dimensions, black and white layout, the end of finishing techniques, variety of paper textures, thickness, varnish, embossment etc. Probably the rupture that the e-book reader promoted provoking an esthetic collapse, following the natural technological evolution of the product, will be explored by new more adapted expression and aesthetical designs, like didactic visual interface, videos, animations, and interactivity.



Kindle 3's screen microscope photo

Method

Functional Fusion
image banks

The market of "pre-cooked" generic images, created with specific demand of the advertising and communication design markets, offered agility, certainty and quality for low budget productions. The service was so efficient and adapted to the design environment that the whole creative and photographic industry, and consequently the creative diversity underwent a severe downsize. The pasteurized and meaningless photographic language of those generic pictures flattened and merged graphic communication into fewer stereotyped shapes, characters and places. Eventually a second fusion by reduction phenomenon would affect the same subject. The popularization of free download image bank web sites and the quality increase in semi professional and professional digital cameras would force the paid image bank service web sites to fuse into fewer more resilient competitors such as istockphoto.com and gettyimages.com.

Image Bank generic pictures

Method

Technological fusion
PDAs/Phones:

PDAs were born from a miniaturization and portability trend of personal computers. It offered a simplified operational systems, simplified softwares, like text editor, calculator, phone and address book etc. The cell phone followed the opposite rout, increasing in functionalities, memory capacity, display size, absorbing gradually personal computer functions. The fusion happened naturally when the PDA companies embodied cell phone functions on their products and cell phone companies started offering more complex computational functions.

Yakumo PDA Delta 300, 2003 | Voq A10 internet phone 2004

Method

Cultural fusion
Nintendo Wii

Since the invention of the first videogame consoles with a few simple games and no joystick, the concept of videogame reflected the general behavior of a generation of lazy, sedentary unhealthy teenagers. Simultaneously to the videogame tribe, there emerged the antagonistic tendency of healthy, natural, active people that would rather perform outdoor activities instead of dedicating time to an unhealthy activity like playing videogames. The advent of Nintendo Wii and its late competitors represent a cultural fusion of social behaviors.

Wii Commercial screen shot

Wii accessories

Method

Functional division
Oversized / undersized

The development of the electronic and informatics industry generated two important product trends, the miniaturization and the enlargement of electronic devices. In one hand, the fact that the size reduction of a device like a mobile phone would take time and large research investments, culturally, having a small electronic device would grant status. In the other hand, owning the largest electronic device meant the acquisition of the topmost product of a line. Suddenly it became clear that owning a 21 inched or an 10 inched notebook granted different levels of status, in one side efficiency and practicality, in the other, high performance and professionalism. Instead, owning a regular 15.4 inched computer reflected the lowest status level in the high-tech food chain.

Mac book pro 12", 15" and 17"

Method

Technological division
LED displays/nobs/lamps

The LED (Light Emitting Diode) system is a technology that consists in giving off light in an uniform frequency. The process is the application of electricity into a semi conductor making it to glow. Originally, this technology was applied uniquely on the production of micro light bulbs, a product that wouldn't be feasible with traditional resistance or fluorescent systems. LEDs were used primarily in the production of on/off nubs, displays, and monochromatic screens for electronic devices. Many years later, due to its low energy consumption and production cost, a variation of the same technology was applied in the production of multicolor diaplays.

3 different applications of the LED technology, the flashlight, the LED TV and the nob

Method

Cultural division
Apple / PC :

The early development of the personal computer was immerged in an intrigue, industrial espionage, plagiarism and patent violation soap-opera-like relationship between Apple and IBM/Microsoft. From the first Graphic operational system, the use of the mouse, icons, the incorporation of additional technologies, CD drives, USB, cameras, sound devices etc, it was created the generally accepted idea that Apple is "the white side of the force", the creative company that invented everything and was mercilessly continuously snatched away by its archenemy, the "diabolic" Bill Gates. Although most of those claims are justified, Apple and IBM systems are now fairly compatible, Microsoft owns a large share of Apple's stock, Apple's processor is Intel, most of the mainstream softwares run in both systems, and yet there is a culturally based "aura" on Apple's computers that justifies functional and technological drawbacks as the higher price of their products, the eventual incompatibilities with softwares and the limited updatability.

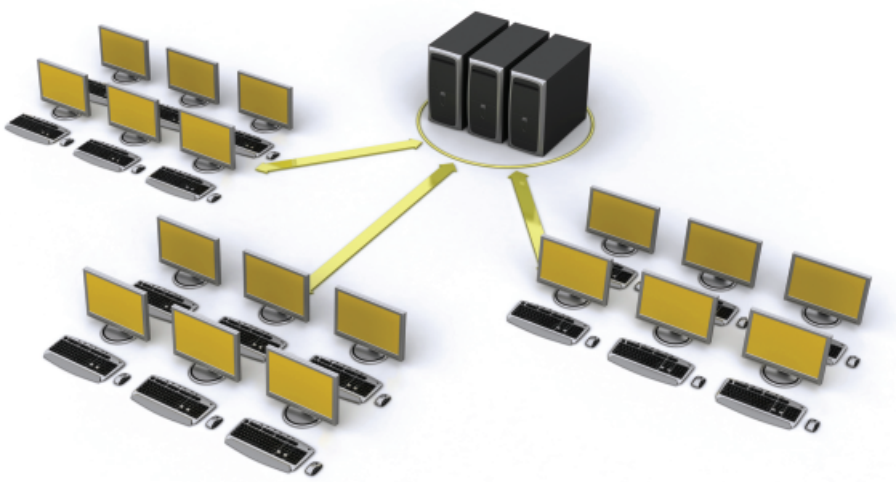
Apple's 1984 TV commercial compared IMB to George Orwell's 1984 character, the Big Brother

Method

Examples of Complex Phenomena

division by expansion
desktop/server

The development and the expansion of the use of internet, the increase in transmitted data, number of computers connected in a same structure, like workplaces, schools and buildings generated need for the development of a new desktop configuration, a faster, more powerful, more robust computer that would hub all the internal and external activities of an internet/intranet structure of computers. This new computer would have functionalities absolutely different from the ones performed by regular personal computers, a different more stable and less friendly operational system and a industrial-looking rather thick and un uninviting case.



graphic representation of a network structure

Method

division by expansion
Guitar/electric guitar

The musical instrument design, that had big variety of shapes and functionings, and a fast mutation rate till the late seventeenth century, underwent a huge transformation after the invention of the Spanish guitar, an instrument, easy and inexpensive to manufacture, with convenient dimensions and a reduced number of strings. Other than that, the physical configuration of the instrument offered a huge range of possibilities, being fairly easy to play amateurishly but complex and sophisticated if played by an advanced musician. The Spanish guitar became the new mainstream in string plucking instruments. Later, the expansion of the use of the guitar led to the development of variations, such as the electric guitar, the semi acoustic guitar, study, concert, and so on.

14 derivations of the classic Torres Spanish Guitar

Method

fusion by reduction
Multifunctional

The invasion of the office environment in the late eighties by an intense technological trend produced the implementation of a series of devices that gradually replaced the typewriting machine and the carbon paper. Copy machines, scanners, printers, facsimiles made smoother duplications of information, the transition from physical to digital and from digital to physical. Eventually, the high cost of ink, the development of virtual technologies, e-mail, cryptographic security systems reduced the importance of those devices. The reduction of their importance led them to merge into a multifunctional product for the occasional necessity to scan, fax, copy, print documents

fax, printer, copier and scanner

Method

fusion by reduction
MDF

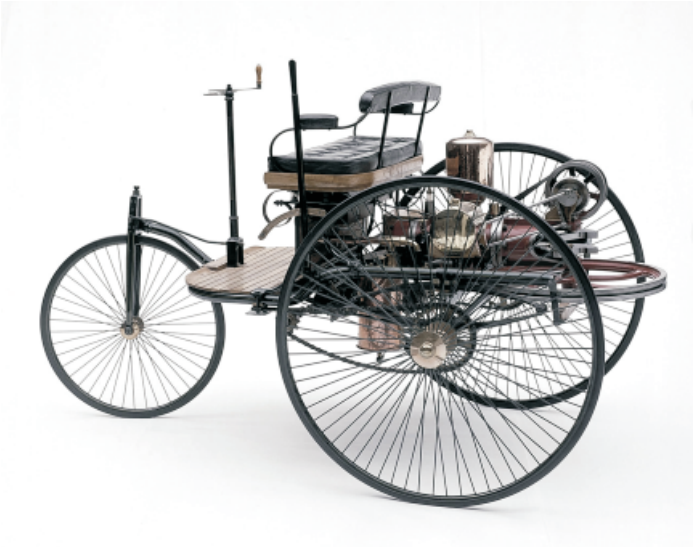
Since the beginning of the crisis of natural resources, some palliative methods and alternatives for furniture production were implemented, among them, the MDF, which is a sawdust and resin based material shaped in boards and used to replace wood in furniture. The practical and economic advantages of MDF for the production of fitment however bring along a series of limitations and inconveniences, like the impossibility to folding, curving and carving, the lack of texture and the bolting and screwing necessary adjustments. These limitations represent a reduction in the productive possibilities and consequently a fusion of aesthetic possibilities. This significant moment in human history, a relapse, a reduction of possibilities is an important sign of the passage of the point of no return. Until a new artificial material with better mechanical performance is invented, the present era might be known as the age of flat strait furniture design.

Night Stand, Edgar Blazona

Method

fusion by expansion
Automobile

In the beginning of the development of the automotive industry, most the car manufacturers worked amateurishly in garages, assembling engines into modified carts. Later the need for more serious investments in mechanics, engineering and the high demand for automobiles forced those small manufacturers to "evolve or die". As in the sprout of new species, the initial number of manufacturers and the diversity of models and solutions eventually underwent the natural selection of the strongest and more adapted. The more efficient and well structured companies bought, or just eliminated the smaller less organized ones.

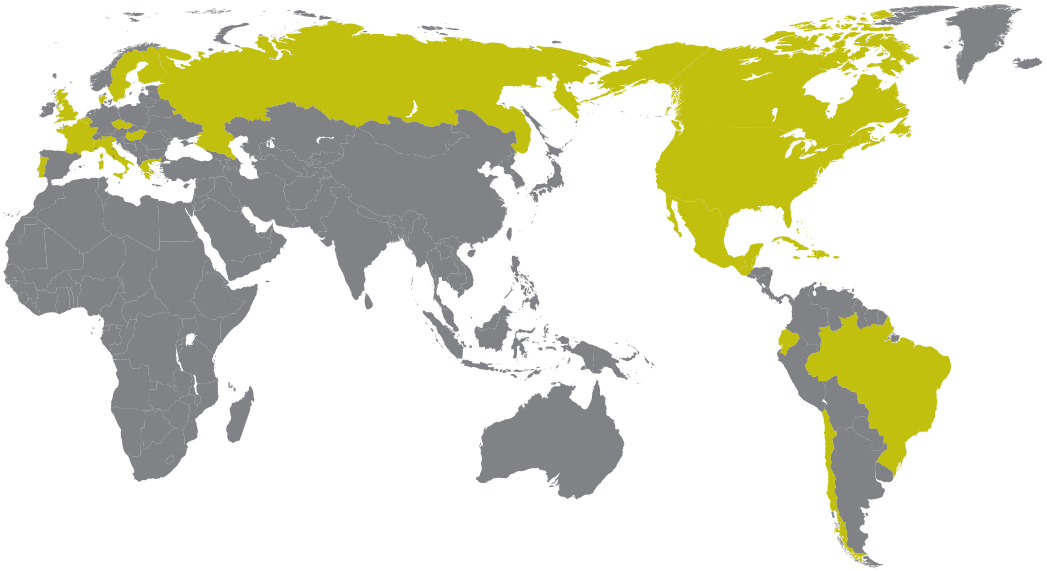


Mercedes Benz, Model Unknown - Mercedes Benz Museum

Method

fusion by expansion
Newspaper - Free Press

The crisis in the press market caused by the decadence of the traditional media meant that people would no longer pay for news once internet provided real time update and interactive content searching for free. The big news companies lost a considerable share of readers and advertising insertions for more efficient and spread media, many of them face severe economic problems and bankruptcy. The reaction of many opportunist companies was manifested by the arise of the free press. A much reduced free version of the traditional newspaper, with brief reading of the same articles and news, with a strong modern and young language and organization and a distribution channel that havocked the traditional newspaper. The newspaper format broke apart and those lighter, smaller faster and more efficient structures emerged from the remaining pieces and prevailed. plumage



Metro Newspaper, published in over 100 cities in 18 countries

Method

division by reduction
Instant Camera:

The instant photo market was always a secondary more expensive, and amateur segment of the photography industry, monopoly of one company, the American based Polaroid. The high cost of the Polaroid film, the advent of the digital camera and the failed release of the instant movie film led the company to bankruptcy. The market of instant cameras was stagnated for a few years, till smaller, Chinese and Japanese based manufacturers started producing again instant cameras and instant film. The same phenomenon happened with the called Lomography cameras, the bankruptcy of the Russian Company and the re-launch of Lomo cameras in cheap low quality plastic by Chinese manufacturers as a vintage cult product was another manifestation of the same division by reduction phenomenon.

Polaroid 600

Method

division by reduction
Music Industry

The technological limitations and cost of the music industry, or rather, the registration, mixing, printing, publicizing and distribution of music, were centralized and dominated by big Record Labels. The necessary investment on the production and release of an album would lead those companies and the whole market to narrow the variety of produced artists that due to the smaller variety were more likely to become famous. Eventually, along with the democratization of information, it became possible to copy, download, share and store music files, the online communication allowed any artist to be accessed and heard by anyone that could have an internet connection. At the same time, the market of traditional radio stations was cannibalized by the web radios. The consequence of those changes was a completely new cultural phenomenon. The record labels, CD stores and radio stations lost influence power, the worldwide artists had to start performing publically to compensate the shrinkage of the CD sales. The market crumbled and those crumbs gained life as countless independent bands, record labels, and radios. The collapse of the industrial monsters generated diversity of smaller structures.

Method

Examples of complex phenomena

Cycle
Evolution of human thinking

The construction of the rational thinking over the history has been alternated with the periods of emotional perception and expression. It is the human mind's manifestation of two opposite and complementary principles, spread and gravity, creativity and order, variety and natural selection. Those periods through the history tend to happen in cycles, as if the rational thinking had a new important technological step to be explored and developed and as soon as the construction of that given technology is complete, it reaches exhaustion point and dies. As a consequence, an opposite new era of emotional thinking takes over, This phenomenon has been repeating itself and being associated with a number of external facts and historical particular events since the first human progress leap, started by the development of Egyptian, Greek and Roman societies. The opposite next period was the dark age, a period in Europe marked by the relapse of all technological achievements.
Around the 14th century, the renascence represented the resuming of the rational thought, also defended as a rebirth of the ancient pre-gothic Greek and Roman develop-ment. The Baroque and its most fanciful derivation, the Rococo, were the next emotional, poorly scientific reaction to this period of rational thinking, were followed by the neoclassicism (rational) and in design Arts&Crafts (also rational). From that point on, as design established its own identity, the mani-festation of this cycle started having design names as design periods, Art Nouveau, Art Deco and Jugendstil (emotional), then Constructivism and Bauhaus (rational), then organic (emotional), then post-war modernism (rational) and so on. All that sequence of opposite thinking periods, other than a historical coincidence, represent a natural cycle, a manifestation of natural evolutionary process, inspiration and expiration, sprout and selection, division and fusion.

Method

horizontal reproduction

Apple's product language - Flat, glassy with rounded edges

The end of an era or a master cycle, manifested by the weakened echo of previous phenomena, in Design could be identified by the repetition or revival of aesthetical periods. In those cases, either the environment is saturated with poorly adapted elements or the elements are stagnated and not adapting to new environmental conditions. The extrapolation of this sequence of events is characterized by an eventual rupture, or the breakdown of the environmental balance. That is the classical scenario for the rise of a new super adapted element.

As soon as the element finds himself established, it will spread is an exponential rate, reproducing horizontally, or rather, not immediately evolving, but repeating itself continuously till the saturation point. The Apple iPod / iPad / iPhone phenomenon is a good example of this process. The development of these minimal multi-touch-screen devices, generated by the trend of eliminating physical elements, disposing all the interactive components virtually, suddenly transformed all the electronics environment. The consequence is the elimination of diversity in benefit of a better level of adaptation.

Iphone 3, Nokia 5800, Motorola Evoke and HTC Desire

Method

vertical reproduction / complexity overlap
Engine

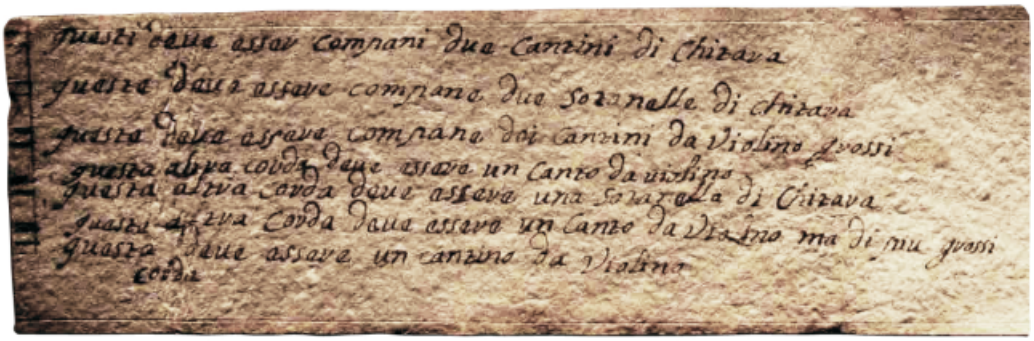
This phenomenon is characterized by the gradual accumulation of complexity, driven by a functional or cultural telos. Manifestations of this phenomenon in human history go from the development of language, agriculture, engineering, mathematics etc. In design, the materialization of this phenomenon can be illustrated by many functional paradigms. One of these cases is the development of the autonomous functioning, the engine. From the first steam powered structure constructed more than two thousand years ago, the engine evolved in a gradual and cumulative technological process, increasing in efficiency and functionality ever since. Starting with the first functional model in the early 18th century, followed by a regular evolutionary trend with the first low pressure engine in 1800, the internal combustion engine in 1867, the first functional electrical engine in 1885, speeding up with the introduction of the first functional automobile in 1886. The petroleum crisis drove the development of the engine to the search for alternative fuels like the hydrogen in 1970, the ethanol in 1875, the hybrid engine in 1997 and so on.
The complexity overlap, the same process that guided the development of all complex multicellular living beings works in the need for adaptation and unachieved goal. For engines, the high cost of manufacturing, the high fuel consumption and the polluting impact are a few of the miss functional characteristics that drive the development of that product.

Aeolipile, first known steam engine, Heron of Alexandria

Method

hierarchical reproduction / deceleration/gravity
Craftsmanship

This model of reproduction is based in fractal deceleration, a repetition of the original structure in a smaller scale. In this model, for the system to expand, the whole structure must grow evenly, not just the later branchings. In human culture, this deceleration or hierarchical structure is expressed by the establishment of the subjection of a newer elements to the precedent larger structure. In design, this method, rather slow and centralizing can be found in the evolution of most ancient non scientific knowledges. The evolution of artisanship, cuisine or design of musical instruments are a few of those disciplines in decelerating process. The knowledge acquired over experience either dies with its creator or the dissemination happens in a master-apprentice, father-son process. Over time, the knowledge developed get lost, as the Stradivarius violin design techniques, the production of some forms of wine, recipes etc. Technology is treated as a treasure to be kept as professional secret

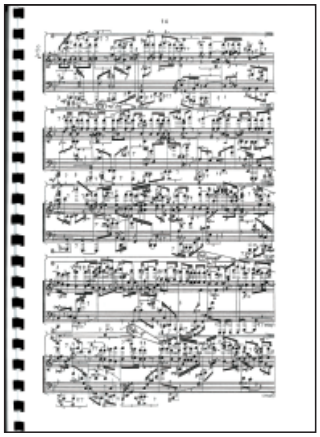


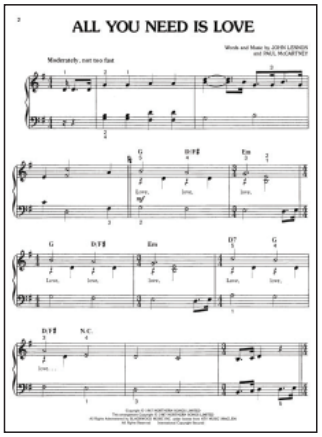
Antonio Stradivari - instructions for the fabrication of guitar strings

Method

anti-hierarchical reproduction / spread/acceleration
Music

The hierarchical reproduction model is characterized by the non hierarchical, growth of a system. The original structure remains unaltered and the new descendants grow with no structural restrictions. In purely cultural, non technological areas of human knowledge, that is the most common development process. Music for example, after an early technical development, reached a stability point after which, no technical or functional goals were set. Music as a science went towards entropy. Over time, it grew tremendously in diversity, the mutation rate increased considerably but the complexity remained stabilized, tending to decrease. The transition from the classical music to the current popular music presented at the same time, decrease in harmonic and technical development and an increase in variety, following cycles of rationalism (Jazz, Bossa Nova, Progressive Metal), and expression intention (Punk, Ska, techno), or cycles of political commitment and alienation, that eventually busted into the modern pop mesh. Evidently, the timeline of music like any other is characterized by fusion, division, isolation and blend of tendencies and origins, the phenomenon described is a general trend.





Frans Liszt's Hungarian Rhapsody | The Beatles' All You Need is Love

Method

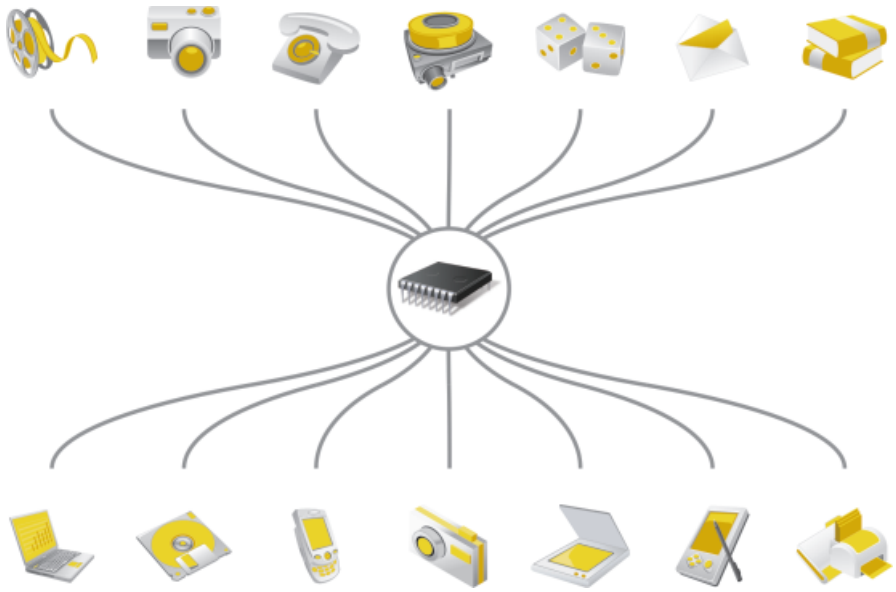
divergence x convergence

Digital divergence

In design, the most famous phenomenon of convergence is the digital convergence, a phenomenon through which many electrical and non electrical devices tended to develop a common evolutionary mutation, or rather, to become digital. Every function performed by watches, photographic cameras, video cameras, calculators and others converged into a common solution, becoming electronic.

Digital convergence

The divergence phenomenon can also be illustrated by the digital era. The development of the digital components, processors and the common electronic binary language allowed the creation of a whole new gamma of products, like notebooks, netbooks, tablets, and desktops, or even, music players, video players, DVD players, portable DVD players etc.



Method

Product anatomy analysis
Mercedes Benz Bike

Designer unknown
Year unknown

This bicycle has a peculiar anatomy, almost paradoxical. This is because, despite of the fact that the "bicycle" category is developmentally prior to the motorcycle or the machine, this bicycle in particular could not be conceived conceptually in a context in which there were the motorcycles or cars. But before we understand the particular path that took this product, we want to understand the path that took the genre bicycle itself.
Since the invention of the first bicycle, like Draisine of Karl von Drais 1818, in which the basic operation characteristics were established until the first really functional model and globally used, Safety Bike by John Kemp Starley in 1885, the segment had a quite inexpressive evolutionary process as regards the cultural component. There was no functional performance stability to support a meaningful cultural dissemination.
After this initial period, now with a functional structure very similar to the bicycles we have today, the genre was divided (Division by expansion) to adapt to different types of use and user. From this moment onwards there were born the city bike, race bike, mountain bike, hybrid bicycles, etc.

Method

A third evolutionary leap happened when, by the depletion of non-renewable resources, and the rise of a series of environmental problems, the bicycle gained the status of environment-friendly vehicle. Then, different automobile manufacturers started (Division) to develop bicycles that: toped the market standard bicycles, reflected the values of the brand and performed passive advertising of brands, and at the same time exploring a new segment of the market (expansion).

Cultural component

Analyzing the communicative aspects and socio-cultural context it is clear that the product belongs to the category of car manufacturers bicycles. The lines are blatantly inspired (fusion) by motorcycles (fender) and by Mercedes-Benz cars, and of course from the Mercedes-Benz logotype (wheels). The intension to make it solid, inorganic is also inspired on automotive aesthetics, in this case, the machines of the end of the 1990s as Ford Focus and Ford Ka .
Furthermore, it is distinguishable a strong influence of Overhaul, aesthetic born in the 1970s in the United States. At that time, the oil crisis has forced the car industry to a very strong retraction. Automobiles large, roomy and purposely pompous were replaced for lighter projects, smaller and cheaper, suited to the new reality. These new projects tough did not satisfy aesthetically a significant part of the public. The result is the birth of a popular movement that consisted of taking old/ancient cars and making them attractive by amendments and addition of custom parts. The bicycle in question inherits the characteristics of this movement more clearly in the mudguard and in the reels.

Functional component

Functionally, theM-Benz bicycle has no apparent advantages or innovations. There is no new proposal for practical use, value or a new way to guiding it.

Method

Furthermore, the fragility of the safety systems of the bicycle category (absence of a visible identification number, easy assembly and disassembly, reduced weight etc) added to the high cost of the product make its use fairly limited, in other words, is too expensive for how easily it is to steal it.

Technological component

All components are an enrichment (expansion) performance and forms existing in other bikes, but made with more resources and pointing towards a higher public (Division). In any case, for as elegant and appealing shapes are, the project is quite framed to the canons, operations and technologies already established. The bike Mercedes stands for other bicycles, as an automobile Mercedes stands for other cars, not antagonistic, instead perfected.

Method

9093 Alessi Kettle

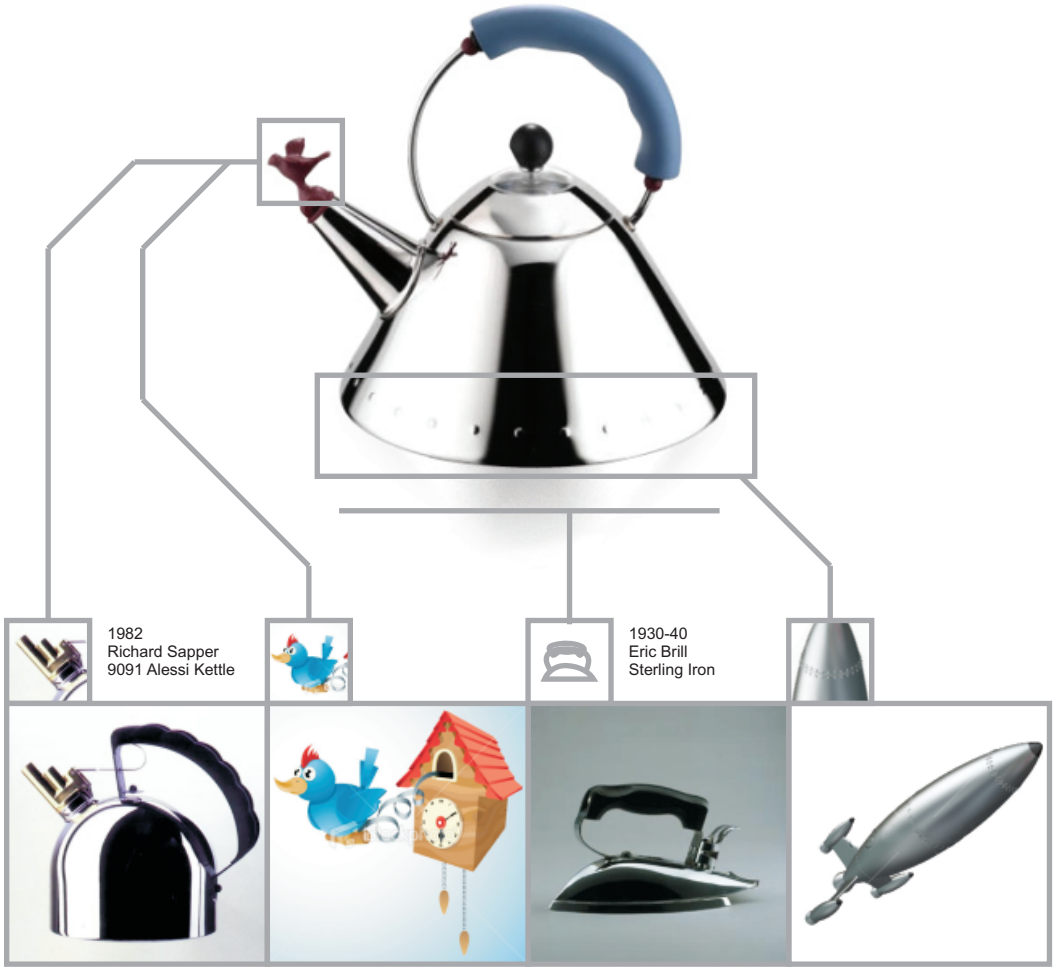
Michael Greaves
1985

The 9093 Kettle by Michael Greaves' main particularity is its strongly communicative design character, much more important than the functional or technological aspects. It is a representation of the cultural and social context of the historical period.

Cultural component

Is a product with a cultural complex, evolutionary line that arises from exhaustion (reduction / end of a cycle) of the international Style, a style that quashed the individuality or the personality of the individual product for the betterment of balance, greater aesthetic neutrality and visual consistency between objects. It takes cues from brand-new Menphis (expansion) that since 1980 attempted to transform the rules of design, abandoning the "Gute Form" and reinforcing communicative and playful aspects.

Method



An example of the genetical heritage of a product

Method

Functional component

The very existence of a designed/branded kettle is already a functional deviation (Division for expansion), a luxurious household object that fulfils the little purpose of boiling water can cost five times more than any another kettle offering no superior technical quality, no rare or precious material and no aesthetic characteristic from classical canonical idea of luxury, gold, ornament, etc. There's a new functionally inherent idea precisely in its communicative character. The fact that is is apparently riveted under where it gets hot, of being blue and blunt in the neck that remains cold and have a birdie where it whistles, proposes to communicate (although obviously) characteristics of product use. It is innovative as an idea to have the user's manual in the shape of the object itself.
Regarding the aesthetic composition in detail, the shape features a series of elements (fusion) from various origins, the minimalist and geometric formal structure is inherited from Art Deco, the particularly pronounced rivets, from Streamline aircraft or automobiles design, the metaphorical joke with the whistle, from the Flintstones cartoons, or from cuckoo clocks or even from another Alessi kettle, (Richard Sapper, 1982), where the whistle's sound and shape resemble a boat whistle.

Technological component

The 9093 kettle has no technological feature that differentiates it from any other teapot. Even with all the conceptual aesthetic and functional work, the semantic structure is absolutely identical to any other. Perhaps (and most likely) it was not the goal of Greaves, to reinvent the kettle, but instead to play with the shape and semantics already established on the teapot. The 9093 kettle became an icon and a resounding sales success. Eventually, his project was adapted to new technological standards, with the addition of the electric version to retain its competitive usability, but in this case, the phenomenon is adaptation, not the mutation to something new and never tried before.

Method

The overall synthesis of design evolution

The study of the connections among the technological advances, the cultural progress and the functional evolution makes it impossible to isolate a Design evolution, excluding all the interference of external evolutional processes. Also impossible, it is to produce an overall design evolutionary map. First of all, because in a certain moment in history, every design evolutionary process took its own route, sharing sporadic events with the whole design ecosystem, but preserving its own fauna, or rather, a good amount of identity among elements of the same group. The second biggest reason not to propose such a gross analysis is the impossibility to gather all relevant evolutionary information to draw a precise and accurate map, then again, the idea of designing a evolutionary map quoting and placing the most important design events in human history would create another big problem, to judge which event is worth of being in the map, and which event is not. A responsibility that this researcher is not much likely to take. Some authors proposed design timelines, sometimes focusing in the technological and technical aspects of evolution, quoting the development of the sewing machine, the engine and the tractor as important design events. Others analyze uniquely the aesthetic aspect of design evolution, naming periods and aesthetics and showing their duration. One of the best works of that kind (Phaidon 1000 Design Classics, 2006) didn't even try to draw a timeline for that matter, it just listed one thousand designs that had a big influence in design history, either by functional, technological or cultural reasons, in general, the three of them.
Said that, the intention of this timeline analysis is to produce an X-Ray of the common sense design timeline of aesthetical movements beginning from the pre-history of design, or rather, the pre-industrial period. Before the industrialization, notwithstanding design existed as a field, the only traceable design evolution happened in Furniture Design. Still very conditioned to architecture and fine arts, the evolution of design periods and movements followed the evolution of architecture, art and western science and philosophy. The real leap that took design to its historic period was the

Method

mechanical and automation revolution that, not only provided the means for design to sprout, but also enabled the development of a whole new era of artifacts that could not have existed before.

The choice of presenting design's evolution since its earliest development had to deal a few preliminary limitations, first of all, the inexistence of a comprehensive design timeline, most of Design's authors start with the Arts&Crafts movement in 1880. Other than that, there is a generalized lack of literature about Design, comparing to Architecture, for example. In fact, the beginning of Design's development was intrinsically dependent from other disciplines' aesthetics, often with delay. The last and most important reason is in the basis of design's conception, artifacts last less than buildings, thus, the historic registration is limited, thus, the literature is less comprehensive, thus the newest Design's events, trends and events blur in nearly anonymity. So, the references to the development of the timeline came from Art History, Furniture Design, and from Arts&Crafts on, Industrial Design. The latest trends and events were named by this researcher based on undeniable strong and recurrent aesthetic tendencies found in books like Designing the 21st Century (Charlotte Fiell, Peter Fiell, 2001), once literature on History of Design hasn't yet contemplated them as periods.

The construction of the timeline presents in the first place, the names and duration of movements (which is an information that most timelines already include), then the development of aspects and concepts of design and their evolutions and variations linking movements with their ancestors, establishing similarities, displaying movements as associations of concepts with mutations, in other words, the principle of evolution.

Finally, the final intention of this study is to understand physically the development of design's diversity, the occurrence of the most basic phenomena, the rising of new technological, cultural and functional leaps, their consequences on design's history and the manifestation of the master phenomenon of evolution.