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Deconstructing meaning: industrial design as Adornment and wit.

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Inventor, *n. A person who makes*
an ingenious arrangement
of wheels, levers and springs
and believes it civilization.

Ambrose Bierce. The Devil's Dictionary.

Abstract

In this paper we present new theoretical perspectives about industrial design. First, we establish that antinomies about function, form and meaning cannot offer a theory of industrial design. Then we bear on advances in Design theory in the literature of engineering design to find out *universal features of design* which are common to industrial design, Architecture and Engineering. Taking into account social and cognitive contexts, we identify the dilemma that is specific of industrial design. This dilemma can be solved in two ways that we define as "adornement" and "wit" which differ by how *the identity of objects* is maintained or challenged by design. Each way corresponds to different types of *rhetoric* -classic and conceptist- that we identify. The combination of adornment and wit explains the generative power of industrial design and its paradoxical situation: *neither Art, neither engineering*. Moreover, the academic identity of industrial design research can be clarified within the traditions of Design theory, anthropology and rhetoric.

Introduction: the academic trouble with industrial design

In 1993, Paris hosted a great exhibition [1] about industrial Design[2]. In the preface of the book of the exhibition, the anthropologist Marc Augé reacted to Jocelyn de Noblet's[3] definition of industrial design: " *Industrial Design is how a large variety of people label objects that from their points of view produce meaning*"[4]. The anthropologist asked: "*what is that meaning that is claimed to be produced by Industrial design*?" Similar questions are repeatedly acknowledged by any handbook or anthology of industrial design. History does, of course, cast some light on the emergence of industrial design (Forty 1988, Margolin 2009), but it does nothing to make it less complex. It is interesting to trace the traditions and the

[1] "Design, le miroir du Siècle", our translation: "Industrial Design, a mirror of the century"
[2] In French, the word "design" means "industrial design". When Design is used in expressions like "architectural design", engineering design "organizational design, the word "conception" is a better translation.
[3] The editor of the catalogue of the exhibition
[4] Our translation.

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many break-off points in the history of industrial design (Forty 1988), but this simply points to the unexpected alchemy that forged this tradition. It leaves research with the task of finding the *identity of the whole*.

In this paper, we present new theoretical perspectives about industrial design. Our focus is to discuss the nature of what is traditionally called "industrial design" or simply "design"[5] since the beginning of the 20th century. This tradition is clearly distinct from Engineering design or Architecture: it is not taught in the same schools and corresponds to completely different social roles than the two last ones. However, to highlight the specificities of industrial design, we will reject the classic antinomies that oppose form, function and meaning. We will introduce a theoretical view of design that is independent of what is designed. Still, it will help us to contrast industrial design from other types of design.

Is there really a need for an academic definition as the lack of one has not stopped industrial design from developing professionally? The answer is positive if we consider that this gap has curbed true academic recognition of industrial design as full discipline and area of research. Moreover, the growing development of doctoral education visibilized the theoretical problems of industrial design, but it has done less to foster their solution and, in Margolin's terms, to avoid research "*remaining equally cacophonous and without a set of shared problematic*s" (Margolin 2010).

For sure, classic definitions of Design are too broad and not specific enough to support sustained and focused academic work. Margolin (margolin 2010) mentioned two definitions which reflect shared views about design and yet lack academic analytical power if one seeks to define industrial design. The first one is Richard Buchanan's: "*Design is a human power of conceiving, planning and making products that serve human beings in the accomplishement of their individual and collective purpose*". The second definition also quoted by Margolin (Margolin 2010) is Bruce Archer's one who states that "*Design is the combined embodiment of configuration, composition, structure, purpose, value and meaning in man-made things and systems*". Buchanan's and Archer's definitions follow two different approaches that deserve to be discussed:

- The first definition remains too broad and misses the specificity of Design. This may explain why Richard Buchanan (quoted by Margolin 2010) stands that "*Design does not have a subject matter in the traditional sense of other disciplines and fields of learning*". Such proposition puts design under dark academic fate, but it is highly questionable. During the 20th century disciplines like Decision Theory, Cognition Science or the psychology of creativity, which share common features with design, have all been able to build a subject matter in the "traditional sense".

- Archer's definition links the identity of design to a *specific list of themes, issues and production variables*. This approach is similar to Vitruvius's archetypal definition of Architecture (Vitruvius 2001)[6]. Yet, such approach does not help to distinguish industrial

[5] In this paper, we will use the term industrial design to describe this tradition. The word "design", when used alone designates the general category that we find in expressions like architectural design, engineering design, organizational design, concept design and so on.

[6] In the time of Vitruvius (1st century ce.) Architecture included machine design, time measurement, war defences, water engineering and so on… Vitruvius claimed that architecture was different from the crafts that it mobilized. Above all, he stated that the mission of the architect was to that guide and renew the art of building by having in mind specific philosophical categories (the famous six functions or themes of architecture, most of them coming from Greek thinkers)

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design from other Design professions, like architects and engineers, who share such list of themes or goals.

What we attempt in our research is to elaborate a definition of industrial design that addresses universal issues and yet explains its differences with other traditions of Design. In the literature and in practice, this definition is usually built upon classical antinomies between form, function and meaning. They have built the discourse about industrial design but lack solid academic ground..

• A critical review of function, form and meaning

a) The most popular antinomy that was used to define industrial design is the opposition between *form* and *function*. Form freed from function was the supposed realm of industrial design. But this idea was soon rejected by the modernist motto – *"form follows function"* – uttered by the architect Louis Sullivan. Beyond the controversy, it should be acknowledged that from *a theoretical* point of view neither function, nor form, have a clear status. The notion of function played an important role in classic engineering design (Hatchuel et al. 2012) but and it was also used to organize work division between engineers and industrial designers, on the grounds that 'functions' relate to objects' utilitarian aspects and technical necessities, as opposed to aesthetic or other sensible aspects which are not considered 'functional'. This classic view has been reassessed by authors insisting more on semiotic and semantic aspects of industrial design (Krippendorff 1989). Indeed, such opposition has its roots in the romantic revolution that followed the British industrial revolution; the latter criticized manufactured products with "a poor design" and praised *splendour* against *utility* (Ruskin 2007). In later periods, utility was also named *function*; and splendour, *esthetics*. However, it can be argued that objects have *aesthetic functions* whenever there are aesthetic intentions (or perceptions) in their design. Any aesthetic value *must* be converted into technical or functional needs. Take a colour, carefully selected to express particular emotions: work has to be done on issues such as its stability, unwanted reflections that reduce its impact or the type of surface that enhances its value. To put it briefly, beauty can be useful (for instance when it provokes care and respect from users) and utility (like power and speed) can be beautiful (as claimed by the futurist manifesto in 1909). 'Function' is the name that we give to any *value* that is used to design, judge or experience an object [7]. However, the language of value cannot fully account for *the identity of objects* (Le Masson, Hatchuel and Weil 2010): we can recognize "chairs", "houses", "pens" even if the values they incorporate or signal are radically changed. We will come back later to this important notion.

b) Krippendorf (Krippendorf 1989) introduced the distinction between *Form and Meaning* and argued tha "*Form, not function, is related to meaning*". This view frees industrial

[7] Despite this, can the expression "form follows function" sometimes be considered meaningful? The answer is negative once again, because even if we retain the traditional meaning of 'function', the expression is only valid in very special circumstances. It is really astonishing that it still has such resonance, despite the fact that it is clearly contradicted all the time. All engineers know that there is not necessarily a link between the functional analysis of a system and the physical or geometrical shape it takes. The same function can be catered for using several different technical principles, each of which has a different impact on the object's form. It is only in the case of simple objects, or ones made of a single material and whose functions only depend on geometric properties (e.g. a burin or shears) that a strong relationship between form and function can be found. And even then, the space for the design of different forms can be opened wide by introducing a simple question, such as how the tools are to be held.

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designers from the old equivalence between form and esthetics. Thus form can be the vehicle of something else than beauty which Krippendorff called *meaning*. This new antinomy also brought its share of logical traps. *Why would function be meaningless per se?* If some form is meaningful, why can't we say that this meaning corresponds to a function, even different from any utility? We can even invert Krippendorff's proposition and claim that it is function as a *signified* value and not form as *a signifier* which is meaningful! Let's take the example of a chair made with a visibly recycled material. The recycled material being recognizable as such (an element of form) signals that the chair complies with sustainable development requirements as a *functional performance*. Thus, form may convey meaning *because* it signals a function explicit or latent (Almquist and Lupton 2010). Moreover, confusion can be easily created by opposing meaning and function. After claiming that "form relates to meaning", (Krippendorff 1989) suggests (p.16) "*four essentially different contexts in which objects may mean in different ways*". These contexts are: *operational, sociolinguistic, genesis, ecology*. They can be seen as functional domains where Krippendorff advocated paradoxically, that form should follow function. Thus the claim that "form not function is related to meaning" that was built against the modernist "form follows function" can also be interpreted as a neo-modernism that calls "meaning" the new list of functions that it advocates.

c) Finally, *what is the status of 'form'*? In spite of its self-evidence for industrial design[8], the notion of form has been shaken up completely by contemporary objects: what is 'form' when working on light, odour, texture, video or interactive software? It is no longer a metaphor of geometry or shape. If most modern objects do not have a 'form' in the traditional sense, they can be approached, like functions, through multiple and renewable *formal systems or semiotic ideologies (*Keane 2008*)* that are also related to *values, symbols and languages* that industrial designers use to design them. These remarks lead to a simple conclusion: function, form and meaning are too equivocal and too overlapping to provide a design theory or an ontology of design.

In this paper, we attempt to think about Design independently from these notions and to *distinguish industrial design from other types of Design*. We will bear upon recent advances in Design theory coming from the field of engineering design and our research endavours to cross-fertilize the literature in industrial design with the literature in Engineering design.

Part I. Design theory: a common ontology for architects, engineers and industrial designers

The idea to define "*design"* without referring to *who* designs and to *what* is designed is not new. Herbert Simon formulated such program but he embedded design theory in the universal claims of the new science of decision. This led him to mistakenly conclude that design could be reduced to problem-solving methods (Hatchuel 2003, Dorst 2006). In the engineering design literature recent research rejected the assumption that design could be reduced to classic reasoning (Hatchuel et al. 2011, Hatchuel and Weil 2001, 2003). In addition, its findings are independent of any engineering domain or criteria and provide a theoretical perspective on design that clarifies its specific *cognitive* and *logical* issues.

Design: generating the unknown from the known

[8] At the Bauhaus, Vassily Kandisky or Paul klee were considered as "Masters of form" (Droste)

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Actually, this literature builds on a simple yet often underestimated fact. The aim of design is to create a 'thing' that is *not totally part of the existing knowledge* of either the designer or the persons to whom it is destined. Following Hatchuel and Weil (Hatchuel and Weil 2003, 2009) this fact has major implications: design is a unique activity which *generates* objects that:

- are unknown before design begins, or *design is reduced to copy.*
- are not obtained by deduction, induction or abduction, or *design is reduced to logic*.
- are not the discovery of pre-existing phenomena or *design is reduced to science or observation.*
- are expected to possess some desired properties that were formulated *before* design begins or *design is reduced to random idea emergence*.

If we combine all these features, design appears *as a specific type of rationality* [9] and contemporary design theory has elaborated new analytical notions that aim to capture this rationality, with a high level of generality. In the following, we introduce some notions from C-K theory (Hatchuel and Weil 2003, 2009), a good representative of recent currents in engineering design, that we will use to define Design in general and to understand industrial design as one of its forms[10].

K-expansions, expansive partitions and expansive receptions

The first step of C-K theory was to abandon classic terminology (function, form, technology, aesthetic, meaning…*)* and to define Design as the constructive interaction between *a desired unknown* (called a concept C) and available *knowledge* (called K). The major implications of this assumption is that design necessarily requires three types of *expansions* [11]:

- *Knowledge expansions (*also called K-expansions*)*: the designer has to expand her available knowledge; not only scientific truths but also social and psychological truths. This means that *pure creativity is not sufficient for design*.

- *Concept expansions* (also called C-expansions or e*xpansive partitions)*: these expansions are modifications of the *definitions (or identities)* of existing objects. It can be shown that at least one change of definition is needed in any genuine design task. These changes are obtained by assigning to existing objects *new attributes that were not part of their previous definition*. For instance, "tires without rubber", "bathrooms with a library" are "expansive partitions", because usual tires are all made with rubber and known bathrooms are not designed to store books. Such unexpected attributes attempt *to expand the identity* of *tires and bathrooms* and they open the generation of unknown possibilities for both of them.

- *Expansive receptions*: design presents to so-called "non-designers" (users, client or design students) objects that cannot fully be part of their knowledge (or no design is visible). Therefore the reception of design is itself an *expansive process* that may need learning, training, exploring, transforming… *From a theoretical point of view*, reception can be seen as a design process even if designers and clients, experience different capacities and social positions.

[9] The literature about "design thinking" has widely commented the specific features of design reasoning, but it has remained a broad narrative of a collection of practices that rarely reached the analytical rigour expected from an academic discourse (Dorst 2010)

[10] C-K theory is presented and discussed in more detail in the literature (Hatchuel and weil 2003, 2009 ; Ullah et al 2011)

[11] By "necessarily " we mean that these findings are consequences that can be formally established using logic.

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Reinterpreting metaphors and the creation of meaning

For sure, the design literature has widely described the role of analogies and metaphors for the generation of new ideas. However, the different type of expansions introduced by Design theory encompass these classic views an clarify the relations between design and the creation of meaning:

a) Metaphors can be seen as *special forms* of expansive partitions that occur in discourse. We know that they are traditionnaly defined as *tropes*, i.e. discourse figures by classic rhetoric. The notion of expansive partition is more universal; beyond text or speech, they can be embodied in any type of matter or media. Designers can build expansive partitions by drawing, mock-up making, or any physical transformations (for instance by assigning a fragrance to a piece of metal that usually smells nothing).

b) The link between metaphor and the creation of new meaning has been extensively studied (Ricoeur 2003). However, in design the creation of new meaning cannot be limited to a conceptual expansion. It depends of the whole design process by which *the identity of an object* can be modified and made *visible.* A main finding of C-K theory is that genuine design is creative and is possible *if, and only if, there is a combination of K-expansions and expansive partitions*. In simpler terms, design needs both discovery *and* creativity, observation *and* imagination, exploring the external world and changing internal lenses (or mindsets). These interactions create the seemingly chaotic appearance of a design process

The dilemma of industrial design: immediately recognizable unknowns

Building on these findings helps to establish that, *due to different cognitive and social history*, design traditions do not organize *the path from knowns to unknowns* in the same way.

- *Engineers can be easily distinguished from the other two professions* because they draw on scientific discoveries and can mobilize important material and human ressources. They have also acquired the cognitive capacity and the social ability to propose *radical unknowns*[12]. Therefore, they can mobilize *expansions* at an extreme level (see table 1 for an illustration of levels of intensity). The first car, the first flying object and the first television were greeted with *astonishment, fear and amazement*! At the time, the commentators had to begin by explaining 'what they were' before they could comment on their value or on the exploit involved. As for their aesthetic, form and meaning, these questions always seemed anachronistic for truly unknown objects. Finally, the perceived social impact of engineering is such, that it is widely acceptable that citizens should learn some technology (or pay for learning) in order to be able to use their designs.

[12] This is not the day to day form of engineering in industry. However, engineering includes such radicality in its identity through direct links to science and technical dreams.

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Table 1 Intensity of expansions for each tradition[13]

	Architecture	Engineering	Industrial design
K-expansion	*	***	*
Expansive partition	*	***	***
Expansive reception	**	***	*

The path from knowns to radical unknowns is only exceptionally within the reach of architects or industrial designers. Both have to organize a more limited, less violent relationship between knowns and unknowns. Their capacity to operate K-expansions is limited. They cannot illustrate their exploits by exhibiting 'monsters', thus their 'unknowns' must simply be *attractive and surprising.*

- Industrial designers can finally be distinguished from architects. The latter have specific constraints stemming from the fact that their work is generally used by communities – families, inhabitants, citizens, etc. –. In addition, their designs are determined by social and technical norms and have a large impact on people's lives. This restricts the space of *acceptable unknowns in Architecture:* although there are examples of museums and theatres with surprising architecture, there are few buildings for housing whose purpose cannot be guessed at the very first glance. Industrial designers, on the other hand, can venture *much further afield*, sometimes even exploring unknown objects[14]. Nonetheless, they are subject to specific constraints in terms of *cognitive a*nd *value judgements*, which are a decisive factor. We are not talking about the usual constraints of cost, production and profitability because they apply to all design traditions. A demanding and core characteristic of industrial designers' work is that they must seek *originality (expansive partitions)* whilst also being *immediately comprehensible* by their potential clients. Jacob Jensen, the famous industrial designer from Bang&Olufsen talked about designing objects that were "*different but not strange*"[15], that arouse "*the power of making decisions without thinking*" in those receiving them. He added that the consumers always react quickly, in a simple trilogy: *"three seconds: fight, escape or love"*[16]. Industrial designers must therefore surprise or attract *under a tight social constraint*: *without the help of substantial explanations or special learning required from the consumer*[17].

We can now reformulate the problem of industrial design. Like all other design traditions, industrial design must organize the transition from knowns to unknowns. But, history has placed them in a specific position: they must produce an *unknown object that attracts and surprises, whilst being immediately or easily recognizable*. Our next step is to identify the type of design reasoning and social processes that are compatible with the "iron law" of industrial design: creating an unknown object that *attracts and surprises whilst never disconcerting.*

Part 2. Industrial design: expanding and challenging the identity of objects

About the identity of objects.

[13] The ratings are only illustrative. They should be interpreted not as quantitaive measures but as rank orders

[14] At the time this paper is written there is a design exhibition in Saint-Etienne (France) called "politique fiction" (politics fiction) presenting radically unknown objects.

[15] Raymond Loewy's MAYA principle (" most advanced, yet acceptable") is a close formulation of this dilemma even if its author never analysed it as a theoretical issue.

[16] All quotations of Jacob Jensen come from a plenary presentation at IPDM conference in Milano.

[17] Indeed, this constraint disappears for designed objects that will only exist in Museums or exhibitions, these institutions being precisely designed to organize such learning.

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Let us examine what an *unknown yet recognizable* object could be. We need first to introduce the notion of "identity" of objects. Let us take the example of familiar objects such as 'chairs'. The history of industrial design is full of examples of *new chairs* that have been recognized as original creations. Yet, thee new chairs are still chairs, even if they present specific attributes that other chairs do not have. Hence, chairs have an identity that is both social and cognitive which can be maintained and recognized in spite of an infinite number of design variations. Designers therefore managed to obtain *expansions of the world of chairs*. Quite logically, some of the attributes retained to design the new chairs are therefore *expansive partition*s of the existing definitions of chairs. We must therefore look at the processes involved in producing expansive partitions which may also *convince and attract people*. Using the notion of object identity, we have only two options left to designers:

- *A process of adornment*: when the new object *keeps its identity* but is distinguished by a new value system.

- *A process of wit*: when *the object's identity is* questioned, made uncertain or in danger but *without being completely lost*.

Distinguishing between adornement and wit can be empirically tested at least from the reaction of users: in case of wit, most of them will express surprise and experience difficulties to designate the object. Yet, this distinction is absent in the literature about industrial design where the most common discussions where between Art and Design. Our main finding is that adornement and wit correspond to distinct intellectual traditions *that combine cognition and rhetoric* in different modes. Through such theoretical clarification the academic identity and analytical interpretation of industrial design can be made less obscure.

II.1. Keeping identities: Adornment as an 'axiophany'

How are objects given new value i.e. adorned? By asking this question, we do not go back to the old controversies about ornament (Adolf Loos[18]), good design, style or fashion. Our task is to understand, with a high level of generality, how objects can *be adorned* i.e. can gain in value while keeping their identity. To advance on this point, we draw from the Hellenist Louis Gernet (Gernet 1968) who studied the formation of value in Ancient Greece. In this work, Gernet captured the long process that gave birth to currency as we know it today. He noted at the beginning of this process the presence of a class of objects that the Greeks called *agalmata*, from the verb *agallein*, meaning *to adorn, to honour*. Initially, *agalmata* were mainly precious objects and prizes won during games and offered to the gods as sacred gifts. Lavish generosity was both a widely popular sign of value and the process whereby the 'value' of the sacred gift *was made visible*. Some *agalmata* were also associated with legends (the Golden Fleece is one of the best known examples) in which they tend to evolve, although they preserve their original value. During this process, the value is transferred to those who are *adorned,* so to speak, by holding the objects[19].

[18] Adolf Loos 's famous paper "Ornament as Crime" appeared first in 1910.

[19] Translator's note: In French, agalmata is translated as parure, from the Latin paro, to prepare, honour and dress. Parure is used in modern French for costumes, finery and sets of jewels (as in English in the latter case), etc. The French verb "parer" is more common, with the same roots and meaning as the English 'to prepare'; it also means 'arrangement' and 'embellishment', as in the English translation we have used here, 'adornment'. The word apparence ('appearance' in English) has the same roots.

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Expansion and revelation of value

Gernet's study provides precious insights into the mechanisms of *adornment*. First of all, it consists in imposing *an expansive value* to the adorned object; this value stems from *a legitimate and unexpected* source and is conferred on the object through a specific transformation. The process of adornment provokes a change in the object, making it larger, *illuminated*.

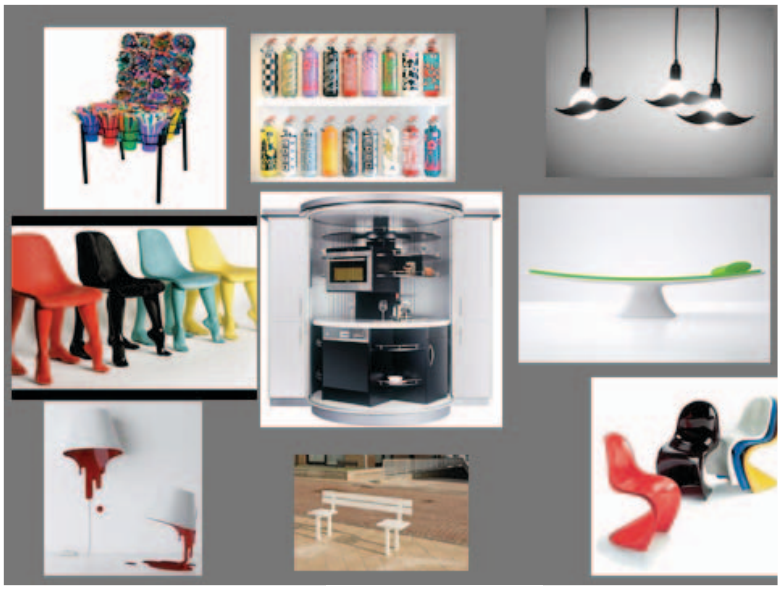

Fig 1

At the same time, a reverse phenomenon occurs: *an intrinsic value of the object is revealed* made *visible* by the adornment. The awarding of prizes or medals brings about the same process of distinction and revelation of a person. Through adornment, lamps, chairs, refrigerators, bathrooms, or any common object become unlimited potentials of value and seduction. It provokes *a transformative expansion* of an object that creates the attractive and surprising power of Design. However, it is crucial to understand that from our theoretical perspective the operation *of 'adornment' is not specific to aesthetic values: it should not be confused with ornament!* It applies *to any transformation, whether technical or social*, that infuses a particular system of new values to a known object *without changing its identity*. Ergonomics, friendly interfaces should be seen as adornments. Adornment generates an expansion by incorporating new value. This definition can be summed up in a neologism by saying that adornment is an '*axiophany'* as it brings to light (from the Greek "phanestai" and "axio "). In Fig.1 we present examples of designed objects that illustrate various types of adornment. The reader can check that all objects can be named even if they present surprising attributes (in the left lower corner, the reader may hesitate to see lamps, but this is a bias of the picture).

Adornment as classic rhetoric

When working on 'adornment', industrial designers can draw from the huge pool of values that are legitimate - or seducing - in their particular time and society. For instance, they can use colour ranges that match the latest trends in aesthetics, materials that represent a high-tech universe or codes from the most socially dynamic worlds (games, images, leisure, etc.). They can also politically or socially *criticize* these trends with *provocative adornments* that signify their engagement. Adornment corresponds to the cognitive and social model of *ancient rhetoric* (Perelman 1982). This ancient discipline also aimed to seduce and convince by designing discourse that could be easily understood by an audience. Topics had to be kept as close as possible of common knowledge. However, through argument, style, and eloquence, new value (truth, smartness, authenticity...) could be given to any thesis. For sure,

industrial design is about things and systems and *not* texts. However, likewise rhetoric uses *tropes* (i.e. standard figures of discourse) designers can use *adornment transformations* that are recognizable and valued by their audience. Adornment corresponds to the dominant and popular view of design thinking (Dorst 2011). Yet, as mentioned earlier adornment is not only thinking and producing metaphors: objects are transformed by design and this needs an important effort of knowledge acquisition and creation (K-expansions). Designers have also to capture new values and new tastes, as a source of new potential adornments (Tomkinwise 2011). Actually, Adornment, like design, can fail: the worst case scenario would be when a process of adornment *depreciates the value of an object and makes its identity more confused.*

II.2. Breaking identities: Wit as an ontophany

Designers can create a surprise by adding new values, but in case of adornment *the object itself is not reviewed or called into question*. To go beyond adornment, industrial designers need to *shake* the object's identity and cause some turmoil in the mind of the audience. However, such perturbation must not last too long as the constraint of being recognizable still holds true. Actually, it is not really a question of re-cognition. The receiver must make an effort to decipher the design output. By upsetting the identity of an object, designers aim to provoke a feeling of *discovery, of freedom, like suddenly stepping into a new world of objects*. Just as we used 'axiophany' to describe the process of adornment, we can describe this second logic as *ontophany*, i.e. a process that not only reveals new values but also *new interpretable beings*. Is this design or creation? Does it give to industrial designers the same status as artists? Actually, the need to be easily recognizable excludes *a free* artistic approach, which would make the objects too radically strange and unique. We must therefore define the type of reasoning that causes liberating turmoil but not nonsense. *This type of reasoning can be found in the tradition of "conceptist" rhetoric.*

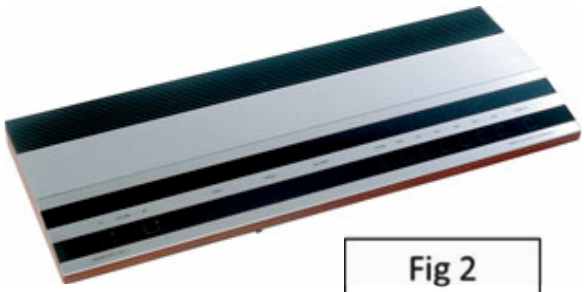

Fig 2

"Searching for a conscious coincidence"

Post-renaissance rhetoric was particularly interested in a type of figure called *wit*, which corresponds to the approach described above. The notion reached its peak with the Spanish exponents of 'conceptism'[20] in the 17th century. We refer in particular here to Baltazar Gracian's treatise, *Agudeza y arte de ingenio* [The Mind's Wit and Art], published in 1669[21]. It is most striking how close the propositions made in this treatise are to this second type of design. Gracian defined 'wit' (in Spanish *agudeza*) as "*a conceptual device, an original correspondence and agreeable correlation between two or three extreme contents expressed by understanding."* He also added that, by understanding the mechanism of wit, *the concept* can be defined as *"an act of understanding whereby one expresses the correspondence between objects."* Finally, this correspondence *"achieves the height of the artifice of ingenuity, and whether this acts by contraposition or by dissonance, it always represents an artificial connection between the objects."*

[20] Cf F. Villeurmier, « les conceptismes », P. Maffesoli « Histoire des rhétoriques en Europe ».
[21] Gracian also wrote several other treatises, including the famous *Courtier's Manual Oracle*, which gave him the reputation of being something of a 'Spanish Machiavelli'.

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Gracian gives an actionable, rigorous definition of *concepts*, which interestingly can be used to analyze industrial designers' practices and discourse when they question the identity of objects. For Gracian, *wit*, the technique that builds concepts, is formed by bringing together elements that are spread far apart or found in *extreme* positions. They can be brought together in many different ways, for instance by forming an oxymoron or by introducing dissonance, or with the emergence of new harmony. Gracian's treatise is an impressive list of procedures for forming wit. Above all, its very profusion shows that wit albeit being a sophisticated system of thought, is one of its most natural forms and can reach its audience[22].

The aim of wit is, however, to take advantage of the *undefined elements* that always exist in known 'objects'. It is in the *voids or holes of knowledge* (Hatchuel, Le Masson and Weil 2012), that new, surprising, unknown things can be generated. Once again, we can quote Jacob Jensen[23] who defined industrial design work as *"the search for a conscious coincidence."* The wording is so close to Gracian that we could think that it was taken from his works, except that we have good reasons to believe that Spanish conceptism is not really part of the Danish industrial designer's culture. His definition sheds precious light on the combination of *surprising sophistication and simplicity* that we could find in Bang & Olufsen's Hi-Fi systems designed by Jensen (Fig 2).

Fig 3

The special reception of wit: the role of intermediaries

The notion of wit defines the *specific system of invention and innovation* that is allowed to industrial design. Ye, wit needs a special form of rhetoric and exhibition. Because the identity of familiar objects has been shaken, *reception is necessarily an active expansion process*. Designed objects may need new names and their value can be interpreted in various ways. The public is invited to act as a critic or to look for guidance from recognized experts or design institutions (Councils, exhibitions, institutions). Yet, wit can also find directly its public as the identity of objects is shaken but not radically changed. Therefore, *design as wit is not Art*, but it needs a type of rhetoric and a social model close from the latter. In a recent comparison between Design and Art (Mc Donnell 2011), the authors find that artists describe their work with a special language: they speak of "alibi, conceit, and scaffolding" in the description of their work. These notions are close to Gracian's definition of wit. Nevertheless, wit does not claim *uniqueness and singularity*, as artists may do. Finally, through wit,industrial designers can put ordinary life into question, or challenge stereotypes and experiences, without special learnings and without leaving the industrial world.

[22] Translator's note: "Wit" is generally used in modern English to designate humour (wittiness, witticism), but the sense 'ingenuity', 'intelligence' and 'understanding' still occurs in expressions such as "have a wit to', "to have one's wits about one", "at a wits' end", etc.

[23] Doubtless the only industrial designer of commercial products to have had two retrospectives of his work at the MOMA in New York –

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In the pictures shown in Fig 3, we have gathered several examples where 'wit' is easily recognized. Most of them are simple objects or machines[24]. The reader can check that they are both familiar and strange, that one is tempted to give them names by forming expansive partitions (a blue fancy motorbike, a "segbyke"). Of course, all these examples are of work by famous industrial designers. Nonetheless, this second model explains how industrial design can be present in an economy dominated by innovation and a cultural system where Art has no rules.

Design as epiphany?

Verganti (Verganti 2009) suggested viewing design as an "epiphany of technology". Is this adornment or wit, or both? The value of theoretical models is to generate more precise questions. What's made visible by design in Verganti's epiphany, the technology itself or a value of this technology (adornment)? And to what extent the technology itself is maintained or revised (wit) in the design process? Verganti's model may be more adapted to the situation of emerging technologies which do not correspond to any existing object. In such cases, authors (Gillier and Piat 2011) have found a tendency to quickly fixate a *presumed identity* to this technique by associating it to known objects and values: here, *epiphany would mean a process of adornment which hides the unknown behind the known*. The same authors suggest avoiding such fixation by exploring new surprising identities of the same technology. Here epiphany would correspond *to the introduction of wit in technical design*. By distinguishing adornment and wit, hence axiophany and ontophany, we gain analytical precision but we also remind that industrial design mixes two distinct models of cognition and rhetoric. There is no unique model for the creation of meaning in industrial design.

Discussion and conclusion:

A core notion: the identity of objects

In this paper we have developed the proposition that industrial design builds on two different universal models of cognition and rhetoric. key to our analysis is the notion of "identity of objects" which is valued by adornment or expanded by wit. Thus the academic positioning of industrial design can be clarified and research in this field should be grounded on two complementary domains:

Table A.	Adornment	Wit
Identity of objects	Maintained	Shaken, challenged
Process	Axiophany :Expanding and revealing value	Ontophany : expanding objects and values
rethoric	Classic (Greek-Roman)	Conceptist (Spanish)
Social model	Classic market audience	Experts and Intermediaries

- *Design theory* that is independent of any professional tradition and that explains with sufficient abstraction and generality how design is possible, i.e. how unknown objects can be generated through knowledge and concept expansions.
- *An anthropological perspective* that analyses the *cognitive* and *social* constraints, as well as the different *models of rhetoric* that are activated by industrial design (see Table A).

[24] Except for the house with a roof like a plane or an arrow which we included here to illustrate that the notion of wit can also be found in architecture)

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It may be surprising that we do not mention aesthetics, functionality, or smartness as domains of design research. Indeed such issues are worth studying in industrial Design schools but *they cannot define its academic identity.* Instead, our claim is that adornment and wit are fundamental cognitive and social phenomena that industrial design research can study with rigour and precision.

Fig 4

In practice, wit and adornment can appear in the same design reinforcing each other. The interplay between adornment and wit is particularly visible and legible in Louis Ghost's chair, designed by Philippe Starck, with a great commercial success (Fig.4). The classic 'grand style' form would have been a rather insipid adornment without the wit provided by the transparent materials, with their effect of dematerializing the object. A same analysis could be done on the celebrated Apple's first iPhone, where the new tactile screen was used both to create adornment (aesthetic purity) and to generate wit (no keyboards in a phone). However their interplay should not be understood as their confusion. They represent two clearly distinct cognitive and social processes.

Further research

For industrial design research, *the adornment-wit model* paves the way for new empirical investigations that will be presented in later papers. Are there types of objects where wit is more frequent and more acceptable? Is it true for high tech products with interactive features? Are luxury furniture and goods more conservative and dominated by adornment? Can we find wit in more common products? What is the contribution of wit to the vitality of industrial design in contemporary societies? What are the conditions of commercial success in each case? Do schools of design prepare equally their students to both logics? The work programme drawn up at the beginning of the article can therefore be based on solid theoretical and empirical grounds. Modern industrial design only seemed to be mysterious and to lack its own reasoning because we did not have a theoretical framework with which to study design activities. A second step was to relate this to the intellectual traditions of rhetoric. We hope to have shown that they provide a very powerful analytical and critical framework. This framework helps set industrial design research into an intellectual project of wide theoretical and cultural significance.

We may now return to the introductory question of Marc Augé: "*what is that meaning created by design"?* What we have learned is that industrial design is neither applied Art serving commercial purposes, nor an emotional and sensitive form of engineering. As a design activity in its own right, industrial design *deconstructs* the meaning of ordinary objects and *explores its transformation by adornment and wit*. In this context, it can rightfully claim its own research and teaching environment in line with the most demanding academic traditions.

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