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# State of the art and cross-fertilization in the jewelry industry: A promising case

## O estado da arte e a polinização cruzada na indústria joalheira: um caso promissor

**Laura Mata García**

laura.garcia@polimi.it

Junior Researcher. Politecnico di Milano. Facoltà del Design. Via Durando 38/A. Milan, Italy.

**Abstract**

The present article intends to participate in the debate on the concept of design as a process that is approached differently by Latin countries and Anglo-Saxon countries. Many authors, particularly English or American, propose design methodologies that are borrowed from other disciplines such as engineering and try to adapt them to product design. However, no consensus has been reached. This paper will discuss the current panorama of the design methodologies present in Mexico, which is strongly influenced by the Hfg Ulm. The second part of the article is a case study of an industry that is considered promising in Mexico: the jewelry industry, mainly that which uses silver as its main raw material, describing the fundamental role that design is playing for this industry, emphasizing the fact that the methodology used by these designers tilts towards fashion design. The result strongly reflects the influence of fashion design methods and processes in a sort of involuntary cross-fertilization.

**Key words:** design methodologies, design methods, cross fertilization, Mexico.

**Resumo**

Este artigo pretende participar do debate sobre o conceito de design como um processo abordado de forma diferente pelos países de cultura latina e pelos países anglo-saxões. Muitos autores, principalmente americanos e britânicos, propõem metodologias de desenvolvimento de projetos emprestadas de outras ciências, tais como a engenharia, e tentam adaptá-las à concepção de produto. Entretanto, não se chegou a um consenso nesse debate. O presente artigo dará uma visão geral das metodologias presentes no discurso do design mexicano, fortemente permeado pela influência da escola de Ulm. A segunda parte do trabalho é um estudo de caso onde se considera um setor promissor no México: a indústria de joias, em particular a que utiliza a prata como matéria-prima principal, descrevendo o papel fundamental desempenhado pelo design para esta indústria e destacando o fato de que a metodologia utilizada por esses designers tende mais para a moda e estilo. O resultado reflete a forte influência de métodos e processos de design de moda em uma espécie de fertilização cruzada involuntária.

**Palavras-chave**: metodologias de design, métodos de design, polinização cruzada, México.

In recent years, design has become an adjective that is applied to products of all types. Its mention evocates images of novelty products, beautiful shapes, seductive lifestyles and comforts of civilization. Design, which was at some point a prerogative of the elites, is now a consumer good available to the general public (Schneider, 2007).

The objective of this article is to contribute to the growing discourse about the design activity not as an end in itself, but as a process that contributes to enrich people's lives, putting them at the center of the project.

It was in the 1960s that a debate around the role of design started with the aim of "scientizing" the design process and thus giving it a status of science (Cross, 2007). The first part of the article will discuss the design methodologies that are prevailing in the industrial design discourse in Mexico, such as methodologies inherited from disciplines such as marketing and engineering.

The second part of the article is a case study of a particularly buoyant industry within the Mexican economy: the jewelry industry, particularly silver jewelry. A brief history of this industry will be reviewed as well as a summary of how the contribution of the designers in the value chain of this industry has been decisive for the

revitalization of the industry. Finally, methodologies and processes prevailing in the industry will be compared to those present in the national academic discourse to try to give a global picture and compare it with the practices in the jewelry industry.

## Design methodologies in Mexico: state of the art

In the 20th century, with the rise of Modernism in design, there is also the desire to "scientize" design. In the words of Theo van Doesburg, protagonist of the De Stijl movement:

> "Our epoch is hostile to every subjective speculation in art, science, technology, etc. The new spirit, which already governs almost all of modern life, is opposed to animal spontaneity, to nature's domination, to artistic flummery. In order to construct a new object we need a method, that is to say, an objective system" (Naylor, 1968 *in* Cross, 2007, p. 45).

In this comment, as in a great part of the Modernist movement, we can observe a desire to produce works of art and design based on objectivity and rationality; meaning on the values of science (Cross, 2007). Such aspirations emerged again in the movement for design methods in the sixties. It wass in this decade when most of the literature on the subject was produced.

This decade was labeled as the "decade of design science" by the radical technologist Buckminster Fuller, who claimed that all human and environmental problems could only be solved by science, technology and rationalism (Cross, 2007).

Most design methods are supported by "scientific" methods, similar to decisional theories and operational research methods. Cross (1999) classifies the design methods mainly in methods for the exploration of design situations, idea search methods, problem structure methods and evaluation methods. He argues that these methods can only fulfill two roles: the formalization of the design process and the exteriorization of the design thought. Out of these four categories, Rodríguez Morales (1989) sustains that the methods that explore the structure of the problem are those that have had the biggest impact in Mexico, mostly the work of authors such as Jones, Broadbent, Bafnall, Archer, Asimow, Maldonado, Olea and González Lobo.

To understand the state of the art of design methodologies in Mexico, it is necessary to understand the origin of industrial design as a profession in the country. The profession rose as such, even before it was formalized as an academic course with a bachelor's degree. In Mexico, the concept of industrial design was imported from the theory and practices of European schools such as Bauhaus and Hfg Ulm (Salinas, 1992). A series of historical circumstances, essentially the need for a rapid industrialization and a growing urban population, influenced by American culture, pushed for answers to the challenges of industrialization in the Ulm methodologies (Fernández, 2006).

It is important to stress that these methods, which are by definition closer to engineering, are the methods that have mostly permeated the design discourse in Mexico so far. Nevertheless, in recent years, the so-called "creative techniques" have also been gaining ground in the Mexican academic discourse and some newly established design schools have adopted them, tilting towards fine art or applied arts rather than engineering.

### Design methodologies in Mexico from the 1970s to the present

It was in the seventies that most bachelor's degree design courses began and they were born adopting the Ulmian philosophy and methods, with some professors of Hfg Ulm coming to Mexico as guest professors (Fernández, 2006). This rationalist current that advocates for the existence of design methods was adopted by nearly all design schools in Mexico, where it became a mandatory subject (design methodologies), and is present in the design study programs to this day (Rojas, 2004).

Two representative examples of the type of design processes that prevail are: the Archer and Gugelot methods (Figures 1 and 2), which are also among the most widely known methods. As it can be seen from the diagrams, the process is divided into small steps, but they have in common that they are both linear processes that start from a problem, go through a phase of analysis, a phase of synthesis and then deliver a final solution.

Some researchers like León (2003) and Bumas Azcanio (2003) even propose the full adoption of engineering methodologies such as TRIZ,[1] as method to speed up the development of new products and add rigor and predictability to the design process. Another popular method is Quality Function Deployment (QFD), which is a method to transform the user requisites into product requirements and deploy the functions, components and processes involved in the product de-sign in a hierarchical order (Cross, 1999). These methodologies, that could be classified as product development methodologies, frequently substitute the design process that precedes the development phase, since in most cases the designer's intervention starts after the brief.

On the other hand, and in clear opposition to engineering methods, other design firms or schools that lean towards fine arts or marketing have adopted mainly American methodologies, such as those disseminated by the famous California based studio IDEO.

IDEO is a renowned design firm that has also given a wide dissemination to its creative methods and has transformed them into a product by themselves. The IDEO methodology can be found in different books, videos and even flashcards with "inspiration" exercises.

The IDEO design process comes mainly from two methods: ethnographic observation and brainstorming

[1] TRIZ is a methodology developed in 1946 by the Russian engineer Genrich Altshuller. It assumes that there are universal invention principles that are the base for any creative innovation. The systematization and application of such principles could then be translated into the capacity to solve technical problems faster and in a more creative way (León, 2003).

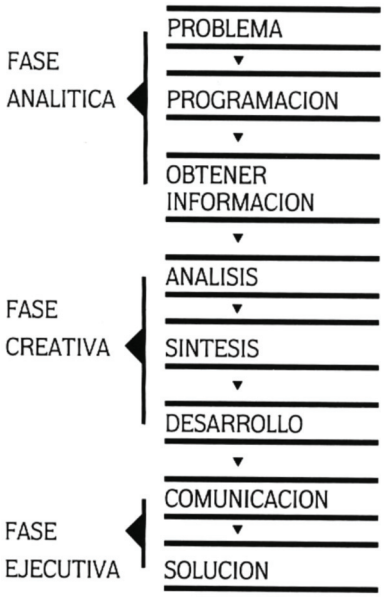


**Figure 1.** Gugelot's method.

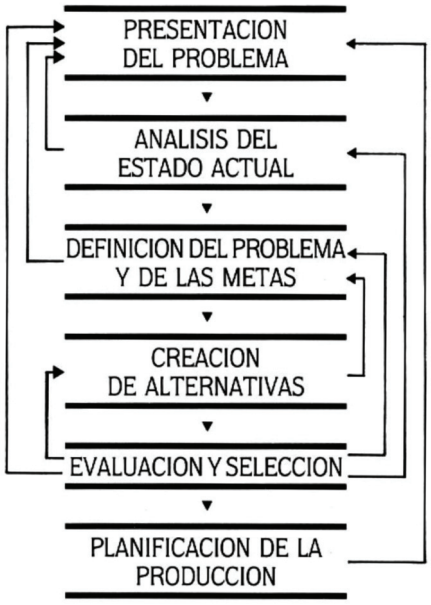


**Figure 2.** Archer's method.

(Kelly and Littman, 2001). According to the IDEO philosophy, innovation can come up by observing the end users of the products with a variety of techniques derived from anthropology. Such observation techniques would then allow the identification of supposed needs that would afterwards be covered by designing a specific product for that particular need (Visocky O'Grady and O'Grady, 2006). Immediately afterwards, the process would then move to a product development phase with the aid of models and mockups.

## Critique of the mainstream design methods in the design discourse in Mexico

Both methodologies have various points in common: they define the work of the designer as a "problem solver," as solving problems that are assumed to be well-defined, and the resulting design process should "satisfy market needs" and "improve the products' functionality."

I would like to analyze each of these points and to compare them with the new theories about the role of design and the designer in the contemporary world.

Firstly, there is the idea of the designer as a "problem solver." One must begin by rethinking the role of design itself. The debate broadens from the role of design in contemporary society to the role of the designer him or herself. An important part of this new debate in the international design circuits comes from Italy, and in this context I would like to quote Germak (2008, p. 60):

> "(Project) comes from the Latin "projectus" (consisting of "pro" forward and "jacere" to throw), a "project" throws forward its own vision of the future [...] The broader, more complex and problematic the vision, the more it will be the result of consensus, interaction and discussion. The greater the scope of the project, the greater its projection and its ability to see in the present beyond the present. [...] The world of design has become more complex today, and there is talk not just of products, services, materials, and contexts, and the instruments used in research may vary according to the area they are used in".

In the methodologies adopted in Mexico, there is a growing tendency to try to limit the work of the designer to the solving of concrete problems, while the design discourse internationally acknowledges the need for a professional figure that can explore complex problems (Germak, 2008) and mediate between the different areas of knowledge[2] (Celaschi, 2008) as well as between producer and consumer.

In the area of problem definition, it is assumed that the client will provide a defined *brief*, or, in a given case, the company's marketing department (after proper ethnographic research) will determine the market's requirements, which in turn will become product requisites. Different authors, such as Donald Schön, point out that those methods are meant to deal with clearly defined problems, whereas in practice one must face fuzzy, ill-defined problems (Cross, 2007).

A relatively recent tendency in managing the design process is to begin the designer's work in the phase that precedes the project itself. The phase before the project, known in the Italian design discourse as *metaprogetto* (metaproject)[3], is acquiring a growing importance. The possibilities of innovation and the generation of radically

[2] Celaschi defines design as a discipline that is halfway between different knowledge systems that traditionally were very unlikely to interact with each other: humanities and engineering/technology and art/creativity with economics.

[3] The metaproject is the initial reference frame that will originate the different design solutions. The results of the metaproject phase will take the form of project brief, best practices, guidelines, competition rules, ideas, tendencies, scenarios or concepts, based on different levels of definition, on how broad is the scope of the project, the design approach and design goals to be reached (Collina, 2007).

innovative products are further increased. Verganti (2006, p. 161) goes even further in stating that "[...] a radical meaning innovation is not pulled by the market. Rather, it comes from a vision of a possible future."

Alberto Alessi, chief executive officer of the company bearing his name, explains: "To work in the metaproject transcends the creation of an object purely to satisfy a function or a need. Every object represents a tendency, a proposal and an indication of progress which has a cultural resonance" (Verganti, 2006, p. 155).

Another point that I personally find too narrowing is the emphasis on product functionality:

> "A designer configures the form of products, which satisfy needs. These needs are satisfied by a certain function. To configure the *functional* forms that satisfy needs, there are methods that guide the designer" (Rodríguez Morales, 1989, p. 44, italics added).

> "The development of new products is a complex activity system, that elaborates the information derived from market needs, necessary to manufacture new products […] The ideal final result (that will be obtained) is that which increases the product's functionality without producing harmful effects" (León, 2003, p. 3 ).

It was in 1954 that Abraham Maslow, with his theory of the needs pyramid, pointed out how human needs, once the basic needs are covered, are oriented towards personal achievement and esteem from people that surround us. New theories about these needs acknowledge that human needs are much more complex than previously thought. Diverse authors, have developed complex theories that include up to 24 categories of human needs. Such categories are neither permanent nor universal (Gordon Rouse, 2004). The fact is that many products, by serving a function, meet a concrete need. Nevertheless, the purchasing of products is an activity that derives from a series of complex processes and factors, which in turn are analyzed by experts from different disciplines such as economics, sociology, marketing, anthropology, material cultures, psychology, etc., among others. To discuss all theories on the possible motivations for the purchase of products is beyond the scope of this paper. However, this quote by Levy (1959) is very illustrative about this subject:

> "The things people buy seem to possess, besides their functions, also personal and social meanings. Modern goods are recognized as psychological objects, as objects that symbolize attributes and objectives, as symbols of the social models and aspiration levels" (Seassaro, 2000, p. IX).

As far as speaking of human needs goes, this takes us to another point of discussion. What can be considered as a need? Many of the products we use everyday don't seem to be "necessary." Other disciplines have focused on studying the contemporary consumption phenomena. Design methodologies used in Mexico do not seem to consider the possible contribution of these disciplines for the moment, except when dealing with needs strictly "pulled" by the market. Nevertheless, as Verganti (2006) points out, radical product innovation is rarely, if ever, pulled by the market.

One could only deduce that methodologies imported from Hfg Ulm and American design firms have not been able to keep up with the pace of times and are therefore not suited for the new reality of production and consumption in contemporary Mexico and the world.

In the next part of the article we will present a case study of an industry that, whereas other manufactured goods industries are declining, in Mexico has had a peculiar blooming, as it integrated design in its value chain, representing a particular phenomenon of cross-fertilization.

## The jewelry industry in Mexico: a promising case of cross fertilization

### Origins of the jewelry industry

The jewelry industry and the mining industry are closely linked, and both can be traced to pre-Columbian times in Mexico. The indigenous peoples already had a tradition of silversmithing. Some chroniclers of New Spain recall that the works of the Mesoamerican cultures "marveled the Sevillian silversmiths" (Díaz Muñoz y Ortiz de Zárate, 2005, p. 21).

However, it was not until the times of the Spanish rule that enormous silver deposits were discovered. Two of the main sites to this day, Taxco and Zacatecas, were discovered in 1537 and 1546 respectively. By the year 1800, there were nearly 3,000 mining zones in New Spain (Valdés Lakowky, 1987).

By the 16th century, silver was already the official currency of the colony, and approximately 25% of all royal income came from this metal. Practically until its independence, silver was the main export from Mexico and nearly every economic activity in the Viceroyalty depended on it.

> "The role of silver as the main nutrient of the Spanish state is especially relevant because, since it played tax functions of such importance, it became the axis of all economic activity. The treatment the Spanish Crown gave to its colony benefited from a development of the mining industry, which had a superior performance compared to agricultural production or manufacturing [...] the colonial heritage gave a peak to the future, since Mexico was born to independent life with an economical disadvantage unlike other European nations that were already enjoying the benefits of the industrial revolution disseminated since 1760" (Valdés Lakowsky, 1987, p. 24).

The peak of the jewelry sector began in 1551 with the arrival of European master silversmiths who set up shops working in accordance with the methods and design that were in use in Europe. The silversmiths were soon organized in guilds and concentrated mostly in mining towns; in Mexico City they were found in the *calle Plateros* (Silversmiths Street). Eventually, with the integration of indigenous and mestizo apprentices, a new Mexican style began to be defined, with its own quality and design ,that supplied the demand of the colonial society. By 1625,

silversmithing in New Spain had reached a high degree of perfection, product of the fusion of European, American, Chinese and Indian techniques. The latter had arrived at the Mexican Pacific ports with the China Nau year after year. After the independence, Mexican jewelry began to follow European fashion, until it began to develop its own style with the nationalistic impulse given by the celebrations of the first centennial of independence (Ruiz de Esparza, 1995).

Silver trade would continue to be one of the primary export products long after Mexico's independence from Spain (Valdés Lakowsky, 1987).

## The jewelry industry in the 20th century to this day

Most jewelry enterprises are small or medium enterprises and are located in traditionally mining and jewelry towns such as Taxco, Zacatecas and Guadalajara. Most of them are family run businesses and work mostly with traditional handcraft methods (Jáuregui, 1999; Rendón, 1999).

During the 1920s, Guadalajara's jewelers worked using the gold and silver coins in circulation. Thus, the metal was very cheap and its quality was guaranteed, as researcher Hilda Vázquez mentions in her investigation "Jewelry Pioneers" (Jáuregui, 1999). The researcher points out that the continuous ups and downs of the national economy caused havoc in the industry, and after the bloom reached in the 1960s and 1970s, the 1982 crisis forced many businesses into bankruptcy.

By the 1990s the situation began to reverse. Eventually, the entrepreneurs began to look for alternatives to the sale of jewelry by weight and began to invest in design. Other stakeholders such as Industrias Peñoles (mining) and El Palacio de Hierro (retail) began to collaborate with others and instituted design contests on a yearly basis. The bottom line is to give the products added value through design in order to be more competitive in the world market (Aguilar, 2003b).

The first jewelry design and technology development center was opened in the year 2000. Basic design courses are given for small businesses' employees and owners. Technological support, research, computer aided design and silversmithing techniques are also provided. By the year 2004, forty of the enterprises that participated in the design center were exporting, mostly to the United States. Currently, the efforts of the different jewelers' associations are focused on the collaboration with universities and the creation of specialization courses in jewelry design (Cámara de Joyería de Jalisco, 2007).

On an individual scale, some famous designers have gained recognition, such as Andrés Fonseca, Daniel Espinosa, Edith Brabata, Martha Vargas, Claudia Suinaga, Isabel Herrera and Ofelia Murrieta, among others (Aguilar, 2003a). Some of them, like Daniel Espinosa, already have opened showrooms in New York and Madrid.

The vitality of the sector is reflected in its numbers: in 2008 the industry grew an amazing 30% and its exports grew by 3% in spite of the economic crisis, whereas other industries that have not integrated design in their value chain like, the textile or furniture industry, have shrunk by 8% and a 30% respectively (Saavedra Ponce, 2008).

## Analysis of the role of design in the industry: Methodologies and cross-fertilization

When I speak of a case of cross-fertilization I mean the following definition borrowed from Bertola and Conti (2006, p. 2): "A cross-fertilization ... [refers] to an exchange between different cultures or different ways of thinking that is mutually productive and beneficial [...]. "This means that in the case in point, we are seeing a transference of processes and methodologies between industrial design and fashion design.

In itself, jewelry design is a complex process, since it has to deal with a product that is far more symbolic than functional. The jewel is an instrument of communication and identity construction, and it has always represented a social symbol and an indicator of the social status of the wearer. However, today much of its symbolism has been lost and only the ornamental function prevails, which constitutes its essence (Cappellieri, 2005).

The Mexican jewelry industry, therefore, was clever in identifying the change of perception of jewelry. It no longer represents an investment or an exhibition of the wealth of the wearer, and has become a fashion accessory in the consumer's mind. Consequently, the traditional practices of the sector would have to be modified to be able to adjust to this new reality.

Bertola and Conti (2006) distinguish four possible levels of intervention where practices of cross-fertilization can be identified:

- Inside the design process.
- Inside the productive process and inside the products.
- Inside the whole economic supply of the enterprise in the market.
- Inside the service, which can be divided in distribution and communication.

In the case we are discussing, one can clearly identify processes and practices that pertain to the universe of fashion, beginning in the design process. When one speaks of design methodologies, the designers speak of "collections" and use the trends in art and fashion as their main sources of inspiration (Aguilar, 2003c ; Blanco, 2005). As such, these design approaches appear more compatible with those of fashion design than with the engineering-derived approaches described in the first part of this paper.

Other strategies have been to find proper spaces in adequate points of purchase, aiming at specific target markets, such as the retail chains Neiman Marcus and Saks Fifth Avenue in the United States, for instance. These retail stores are better known for their affinity with the high fashion world and they offer clothing and accessories from the world's most renowned fashion designers.

At a brand communication level, the names of the designers are used as labels, as a famous fashion designer or stylist would, rather than a more anonymous product designer. All communication efforts such as events, art exhibitions, contests and synergies between the different stakeholders are meant to create an industry brand awareness (Torres, 2005).

It can be observed that, from the realm of fashion, the aesthetic sensibility, the mechanics of purchase and use,

the distribution and communication of the brand and the products have been adopted. From industrial design, strictly speaking, the methodologies of product development, such as the adaptation for mass production and the use of computer aided design technologies, are maintained.

## Conclusions

One can observe a strong contrast between the design methodologies that permeate the national design discourse, which lean towards purely engineering methods, and the peculiar reality of the jewelry industry, which has been "contaminated" with practices from fashion design.

It is interesting to notice how other industries, including the textile industry, have been facing huge problems for many years. Diverse factors, such as Chinese competition, the price of electricity and labor, and the lack of collaboration with designers have combined into a very undesirable scenario for all actors involved.

The phenomenon of the jewelry industry is a peculiar phenomenon of an industry that is closely linked to the territory and is constituted practically in its entirety by small and medium enterprises. The phenomenon described in this article has a cohesion and common action lines that are intended to guarantee the survival of the industry in the changing world market. The role of the product in itself has changed (from an investment in a precious metal to a fashion accessory), which in turn was a milestone in the transition from a traditional industry to a new industry model guided by the change of the product. One can conclude that the result, if it had blindly adopted the existing product design methodologies, would have been very different.

The result is products with a high symbolic value, a type of value traditional design methodologies do not seem to consider when approaching a design project and can rarely be pulled by the market. The contamination with the world of fashion design has contributed to bring into jewelry design a dimension of added value that it did not possess. Other national manufacturing industries could also explore design, with its many possibilities, as a route towards the production of added value, tapping the existing production districts with promising consequences.

A possible area for future research would be, for a further exploration of the industries' practices, to conduct an in depth study on a case by case basis in order to determine a series of best practices and study their possible transmission to other industries.

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