



CREATIVITY IN DESIGN: THE FOPREC METHOD AS A SUPPORT ACTIVITY FOR CONCEPTUAL DESIGN

Plesa Ioan

Technical University of Cluj-Napoca, Memorandumului Street, No. 28, 400114, Cluj-Napoca, Romania

Corresponding author: Ioan Plesa, plesa.ioan@gmail.com

Abstract: In a world that is subjected to rapid changes, the ability of generating new ideas for products is essential for any company that aims to preserve the competitive position. The interest for integrating design in the economic sphere's equations, that is prevailing now more than ever, makes the importance of creativity more consciously sustained in terms of obtaining the creative product. In this context, in the design research field coming up with new methods that constitute the basis of exploratory instruments, destined to the initial phase of the creative design process, is a current and favourite subject concerning the issue of how the existing knowledge can be improved in order to obtaining the best solutions to the problematic of concept.

The present thesis aims to discuss the creation of methods based on sustaining the creative conceptual design of products according to combinational argumentation. The thesis covers the proposed case of an exploratory method based on pre-creative forms as alternative inspirational source. This work suggests the pattern of creative exploratory method based on pre-creative forms that act in the process of the objects' shapes as a supporting instrument of creativity for the designer.

Keywords: FOPREC Method, pre-creative form, exploration phase, conceptual design, creativity.

1. INTRODUCTION

In design research the Protocol of the Delf-1995 has highlighted the importance of the mechanism of thinking in design, conclusion that lead to becoming aware of its importance, through recognizing the owning of personal characteristics, which triggered the creation of the research basis of the activity of thinking within design, in the design research part, (Cross et al 1996).

Considering that in specialized literature the process of conceptualization is considered having an essential part in defining creativity [Cowdroy and Graaff de (2005), and at the same time being perceived as the highest level of creative competence. Due to the fact that this area hasn't been considered as an influential one in terms of the result of design for a long time,

design research granted more and more credit to this line concerning the pressure of design practice and the conditions of the context to which it is subscribes as a creative designer. Through the available studies we are offered few and scarcely diversified cases related to the problematic of creating methods based on the creative strategies offered especially to specific areas of design in terms of improving creativity in obtaining creative results. In this sense, this thesis aims to be an entailing approach to this research area.

The problematic that this thesis is subscribed to be that of improving creativity in the creative process.

By making an overview of the specialized literature I could notice the researchers' concern that began to show concerning this work phase, which came about once the importance of the role of creativity has risen in terms of the role it plays in product design as a triggering factor of innovation, due to which the interest in improving creativity has risen.

In an initial phase, the researchers' interest was directed towards generating ideas, only recently discussing also the subject of the exploratory phase.

Until the present, there is little research that took the sources of inspiration of designers in the informing phase as a subject of their study (Pasman, 2003; Restrepo, 2004, Keller, 2005; Bouchard et al, 2008). The subject of the thesis makes reference to the aspects concerning the access to the sources of inspiration through the vision of processing the sources of inspiration based on a strategy chosen according to the actual state of the research.

2. CONCEPTION PROCESS

In specialized literature the process of concept activity of designers has many propositions but in our approach we consider the model of Cross (2000) accurate that is accepted by the majority of researchers. This is seen as a process of creative elaborate, in four distinct linear phases. These are: the

exploration phase, the generating phase, the evaluation phase and communication phase.

In relation to this model, the subject of the study is positioned within the exploratory phase, which in essence is a phase of the operations of information and inspirational exploration. This phase consists in assuming the tasks of design objectives, expressed in the tasks notebook and also as the preliminary phase of generating ideas, that of the exploration of sources of information and selecting the sources of inspiration. In specialized literature, the exploratory phase had more locations for defining itself, different among them, starting with being called as the phase of "fact-finding"(Osborn, 1964) or of "collecting" after (Schneiderman, 2000). This phase on the other hand is considered as an essential phase for designers through which they can arrive to the "constructing knowledge about the problem"(Amabile, 1983). Howard et al (2008) claims that the phase of generating ideas of the creative process has the most importance in the result of the project and sustains the necessity of integrating the creative process in the design process image. The aspect of placing the objective of this thesis is found in the exploratory phase of the design process of the creative products.

2.1. Combination as a creative strategy

The strategy through combination (the strategy of expanding the existing) is based on the view that objectives are seen from the perspective of the designer as some conglomerates of constituent components, available at any time to be drawn into combinations that satisfy new imaginary configurations of new concepts. This strategy is the most frequently used in obtaining the new. It is present as a principle in the genesis and evolution of life.

2.2. Creative strategy in process

It is known that in specialized literature the way of tackling things, the work style, and strategies chosen by the designer in terms of creativity are decisive in favouring or blocking the work flux. Nagel Cross noticed that once the way of making ideation changes, the efficiency of measures that include quantity, quality, novelty, and variety are extremely affected (Cross, 2000). This highlights the fact that those subjects who got the task to search for solutions based on loose and imprecise specifications were less productive experiencing blocks in terms of producing solutions to a greater extent than those who got more precise specifications who did not experience blocks, being more productive than these. This state explains how those who worked in the space of imprecisely defined solutions were confronted in the first part with the issue of restricting the search area whereas others were not. But in terms of facing the same

tasks, this state was not present in the majority of the experienced ones. After an initial analysis we could deduce that the state of discomfort is triggered by the lack of an appropriate approach to exploring the sources of space within the domain in their instrumental portfolio.

2.3. The source of inspiration

The designers create patterns first based on their visual properties, in which the shape plays the supporting role in terms of the characteristics of function, aesthetics, and semantics of the artefact. Nowadays in design practice the visual information is made, in an overwhelming proportion, based on observing of the reproductions of an iconic nature.

It is important to discuss the significant distinction through which an object is considered abstract or concrete. Representing an object is concrete, without it being the concrete object. A visual representation, in this case an iconic reproduction of the object manages to denote the perceptible visual qualities, by observing the qualities of identification concerning the shape, structure, and characteristics of the represented object. Thus, the presence of the represented subject can be materialized notably.

In this way the reproduction represents a source of knowledge of its own, which cannot be doubted.

On the other hand expresses the product of his imagination through other types of representations, other than the iconic ones, in this case the sketches that are used to represent thoughts of visual communication, in order to generate solutions (Pei et al, 2011). Through these representations, the designer gradually generates the construction of the structure of the new concept concerning the future object's entity. These representations show information regarding the shape of the object and the details that build up its identifiable character.

The designer makes the work easier through the sources that he owns, being interested in owning and creating a personal basis of sources of inspiration, collecting them personally through different means.

In specialized literature the personal inspirational basis is considered a tool for design, which can be simple and complex, rigorous or randomly built, playing an important role in obtaining and affecting inspiration.

2.4. Combinatorics and creativity

From the researcher's perspective the method intended to improve the act of exploration is considered one that provides the sources with qualities of diversity, proper consistency, of the options and of multiple ways of interpretation.

Linus Pauling said that, "the best way to have a good idea is to have many ideas." Research showed a link

between the average number of ideas and average number of good ideas (Kudrowitz and Wallace, 2010).

Combinatorics ensures the most levels of freedom in finding solutions of all creative strategies, through assuring alternatives within options, a fact that helps the appearance of novelty in a more secure manner.

The prolific aspect held is very well portrayed in the book entitled "Art Conjectanding", in which Bernoulli described combinatorics as "the art of enumerating all the possible ways in which a given number of objects may be mixed and combined so as to be sure of not missing any possible result".

By creating a significant quantity of references, we can obtain the first and most important premise of a more profound exploration in terms of getting to know the possibilities of obtaining the best quality and solution for the objective.

The aspect of interpretations of the sources of inspiration is usually given by a type of uncertainty or by the availability of two or more distinct interpretations from the perspective of quality, and which is appropriately called ambiguity. (Stacey and Eckert, 2003) It is seen as a facilitating factor of creativity, which ensures the quality of alternative interpretations of the sources of inspiration, instilling them the attractiveness preferred by the designer, the interpretation of which he uses to express himself.

These aspects of quality can be considered a significant ingredient in creating tools that serve the phase of generating ideas in the end.

2.5. The unique method is an insufficiency?

The objective of the thesis targets the creation of a new method of inspirational exploration directed towards enriching creativity in the process of creation. This mainly concerns the contributions in optimizing the creative phase of exploration. Thus we can understand the improvement of creativity. Studies from the specialized literature show through many examples that the improvement can take place. A concrete case done in the phase of exploration in this sense is the pattern conceived by Bouchard (1997) based on analogical reasoning, materialized in a practical form, of a computerized tool based on the ATC method.

Nigel Cross, describes in an essential manner the current direction of research concerning the phase of inspirational exploration with reference to the process, person and strategies. He claims that the act of ideation is not a monolithic process and that the designer needs different strategies, in different cases and in the changes of state within ideation.

The fact that the focus is on the study of the strategy of the idea/unique method, it is sufficient to explore the ways of ideation (Manikandan, 2012).

In this manner design research will need the necessity to create flexible methods based on specific methods of exploration that allow the ability to meet the needs of the designer, in order to sustain the inspirational state of mind, that is vital to create conceptual ideas.

This activity in the design practice is weakly served by methods, but we can remind here the accomplishment of the ATC based on analogical reasoning.

After going through the specialized literature there were no methods based on combinatorial reasoning to be noticed.

2.6. Inspiration can be improved?

Can the sources of inspiration go through improvement? If we looked at the source of inspiration as a raw material of the creative concept it may be that through suggestion that we could benefit from the vision according to which through the specific methods from the conceptualization process we could consider pre-processing the source in the sense of improving its basic quality. From this point of view, and taking this approach as a beneficial direction of development, it is desired that we should expose the suggestion that the source of inspiration undertakes favouring improvements of the qualities of the existing state in order to increase the suitability so that it can be more stimulating for the designer. Thus the source of inspiration could become suitable to its adequacy through the basic steps of formalized operations in an algorithm of strict phases of accomplishment, comprised in one method.

The result of these refining processes of the existing information are found as semi-products and generically called pre-creative forms. These forms, thus obtained in their status do not represent neither the group of the existing sources nor of the future concepts, but representing a hypothesis of intermediate work having the role of enriching the number of existing sources, building new forms of inspiration at the composition of which the activity of selection, prevision, and interpretation of the designer is needed. The operation of interpretation and shaping represents a form of generating ideas, assuring the novelty and diversity that is necessary to newly created concepts.

In the research of work methods of the creative conceptual design, the source of inspiration as a triggering source of the act of generating ideas in specialized literature we found certain precise concerns on aspects from specific fields, (Eckert and Stacey, 2000) but not directed towards the vision suggested here.

3. THE PRE-CREATIVE FORM

Stimulus is responsible for triggering, through mental process and in scarcely known ways, combinations and interpretations that are ultimately outsourced through the sketches. Such a stimulus can be seen as a context in which individual interpretation through shaping and composing shapes can lead to a desired and often unexpected result.

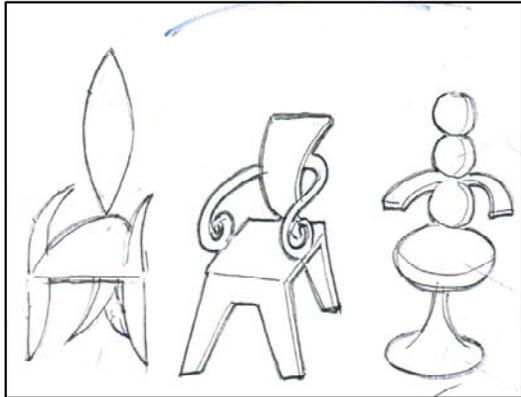


Fig.1. Experiment-Tree Abstract Form of chairs, as generative forms

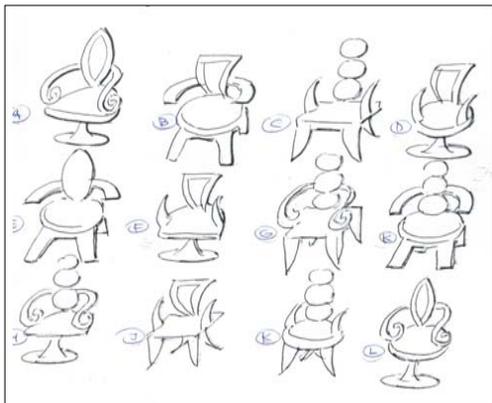


Fig.2. Experiment-The Pre-creative Forms (FOPREC)

By dealing with the current proposition that aims to create a stimulating context inspired from the existing sources and combined base on the designer's level of inspiration.

Thus it is desired to advance the proposal for a pattern of creative stimulus in the form of an ensemble of shapes of a hybrid, not articulated, ambiguous, accessible, visual nature, exposed through creative interrogation that has to role of facilitating the shaping of pre-conceptual forms that are called pre-creative, through an interpretative shaping, matched to wishes. The pattern is called "pre-creative form" or FOPREC them being Romanian acronym for the "forme pre-creative", and that contains the explanatory representation of the

depiction of preceding the form and the goal of its destination in initiating the gain of conceptual, creative forms.

Pre-creative forms are made during the exploration phase and can be created by the staff, by designers, in the form of a set of elements. They can feature elements from the targets intra domain, from the closer inter-domain or the farther inter-domain. The proportion of combined elements that belong to the same form of the source can differ according to the options of the designer.

The method aims to ensure qualities to newly created sources through pre-creative forms by being: easily approached in terms of interpretation, assuring a great density of options, assuring the diversity and to assure the appearance of unpredictable forms. The accomplishment of these goals can be made by assuring a high level of ambiguity of pre-created forms in order to obtain suitable stimulus to multiple interpretations and through assuring the obtaining of diversity of forms based on combinatorial principles.

4. THE FOPREC METHOD

The FOPREC Method consists of creating pre-creative forms to which six defining operations are needed.

The first operation is that of assimilating de objectives of design indicated in the brief. The second operation is the selection of elements from the existing sources of inspiration, based on the options concerning the personal perspective of the designer, followed by the operation of composing the set of elements selected based on the typological structure of the object appointed in the brief, materialized in a hybrid form, with an unarticulated and ambiguous aspect.

(e.g., the typology of the structure of target object "terrace stool" can be found in the proportions of the pre-creative forms.)

The third operation, the one through which a corpus of diverse pre-creative forms is created, in unlimited number, which is constituted in a display board, the fourth operation of interpreting and shaping pre-creative forms according to the objectives from the brief aiming to obtain a version of new conceptual forms.

The FOPREC Method is based on creating a board in order to display the pre-creative forms created with the goal of displaying hybrid forms, and as a reference in analysing results so that in a final hypothesis it can become de source of a work archive. The pattern as the board's format remains to be developed and materialized in additional works.

5. THE EXPERIMENT

An empirical study was made through which it was verified whether the proposed procedure, the one of creating and interpreting pre-creative forms, can be considered an access to the source of inspiration, useful to designers, seen as an alternative way of obtaining new sources of inspiration, other than the existing ones.

A primary testing of the present suggestion was conducted within an experimental session to which 5 experienced designers from the furniture design field were invited as participants.

The experiment was conceived in order to obtain a primary contact, which created a first impression and practical discussions on the FOPREC Method. On this occasion work samples were made and observations from the participants.

The method was presented along with the intention according to which it was created with the explanation of how the method can create usage potential in inspirational exploration.

Preparing the experiment consisted of creating pre-creative forms displayed on a board. The applied phase consisted of a presentation to participants of display boards, identical for all participants. A board, with a content of 12 pre-creative forms, chosen and composed, prior to the meeting, (figure 2).

Forms were obtained by combining elements from three seats with abstract, outlined shapes (figure 1). This formula was chosen to be applied in order to use the pre-creative forms, predefined and outlined for creating a simulation schematic of principle of the method that provides data to understand the principle of the method and how it is perceived by the participant, rather than in testing the creative and interpretative qualities of the participants.

From the perspective of the participants simulation had aimed to submit, initialize and test rate of interest that the method can generate terms of its understanding and interest in use. Through this option of the experiment the possibility was created for participants to only be exposed to the second part, the interpretation of prefigured forms, fully understanding its purpose. The participants task was to select five of the proposed forms from the display board and interpret them individually in order to obtain new shapes of seats, which could be labeled as potentially new and interesting.

In conclusion in this primary phase it was accredited with great interest by participants and perceived as a potential support in improving creative activity. Thus expectations were built up in terms of the proceeding of objectification.

6. CONCLUSIONS

Under the issue of favoring creativity in product concept the assumption on inspirational exploration phase was launched which wants to create a work tool for designers. Actually along the state we followed the sustainability of the necessity of creating new types of inspirational sources, as pre-creative forms.

The conclusion of this state is that there is no exploration method based on creating and interpreting pre-creative shapes, obtained by means of a combinatorial reasoning for object design.

The results of the experiment confirmed the way the proposed method was to be approached, that of an easy approach, that is easily guessed during usage, with an evident course of changing the work style with reference to the interest that it holds by offering through exercising interpretation a share of unexpectedness and novelty concerning results.

We could observe, equally, that designers used all their available time even if it was slightly exceeding the task, easily getting involved in expanding the exercise of interpretation to a larger number of interpreted pieces than the one suggested through the objective. Among the participants the method was considered as a prolific, inspiring and intuitional one in its action.

In my vision I can see that a first step in this direction is creating proper methods to the principles of conduct specific to the creator, aiming to reduce the frustrating routines of the actual work by creating digitized instrument formulas that can encourage the designer to develop his own abilities of analogical nature, using a work medium that is dominantly natural-digitized and that can sustain the collaboration with the existing systems in the engineering design process, and to ensure the integration of creative design in the design process at the same time.

Through this proposition of the “pre-creative shape” oriented towards facilitating the appearance of shapes conveys an increased level of probability in the appearance of uniqueness in terms of results.

Premises that lead to the sustainability of the level of uniqueness are generated by the diversity of sources from which selections can be made, the large level of possibility that each person’s choice offers and the diversity of the combining methods possible in obtaining an ensemble of elements as a pre-creative form.

The essential quality of the method is to facilitate the creation of a support of interpreted elements, as an experimental instrument of an interrogative nature, auspicious to stimulating the imagination towards obtaining something new, supporting the designer to

become a better predictor of creative conceptual solutions.

The method is intended to be a stimulating one and also anti-block the flux of creative perspective. The role of the FOPREC Method is to train the exploratory, intuitional and interpretative side of the designer in terms of obtaining creative solutions.

Related to the creative strategy through analogy that uses sources of inspiration of closer inter-domain provenance and farther intra-domain, the strategy through combination has the large possibility of using intra-domain, closer inter-domain and farther inter-domain in a more rigorous manner. From this point of view using the method is of a more complex nature and too expensive to be accomplished by analogical approach and is more suitable for the implementation in a computerized instrument.

Taking into consideration the fact that the method's process is difficult to be performed by analogical means, developing a line of creating a suitable model to be transposed in a software instrument, for which a set of instructions and recommendations will be created.

From a realistic perspective the method can be considered extremely important both for research as for creative design.

Hoping that this thesis can constitute an additional source of understanding the way creativity is viewed and at the same time that it can become a source of inspiration of new approach and development in terms of optimize the work methods for design practice.

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