From Ideality to Reality- a Case Study of Mondrian Style

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Abstract. Ideality describes the arts striving toward perfection, beauty and refinement in all aspects of life. For reality, the product should also fit into a context of use and meet user requirements. Transforming "ideality" into "reality" involves more than considering the product design itself. It remains a challenge to represent use contexts and user needs in a way that designers with technical backgrounds are able to make direct use of them. When designing "arts" into "business", we need a better understanding of human-art interaction not just for taking part in the humanity context, but also for developing the interactive experience of arts. Therefore, we propose a general framework for aesthetic design that applies to representing human-art interactions and translating aesthetics into user requirements in real product design cases. The intended purpose of this paper is to provide a framework for examining the way designers interact across the art and the interactive experiences of users in the design process.

Keywords: User experience · Cultural product design · Mondrian style · Aesthetics

1 Introduction

We now live in a small world with a large global market. While the market heads toward "globalization", design tends toward "localization." So we must "think globally" for the market, but "act locally" for design (Lin 2011). In the global market - local design era, connections between arts and aesthetic design have become increasingly close. For local design, culture and arts value-adding creates the core of local design value. It's the same for the global market; local design is the motivation for pushing culture and arts forward in global market development (Lin and Chen 2012). Recently, creative industries are constantly emerging in culture and arts and can become a key trend in aesthetic design (Monk and Lelos 2007). While aesthetic design is under tough competitive pressure

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from the developing global market, it seems that the local design should be focused on "culture and arts" for designing "aesthetics" into modern products (Smyth and Wallace 2000).

Culture and arts play an important roles in the design field, and will be a key design factors in the local design. Thus, designing culture and arts into products will be a design trend in the global market (Lin 2007). In today's competitive market, "innovation" serves as a competitive advantage allowing companies to dominate particular market segments. With respect to corporate strategy, innovation is the key not only to extending market share, but also to increasing commercial gains (Lin and Chen 2012). With the development of industrial tendencies, most companies gradually realize that the keys to product innovation are not only market and technology aspects but also aesthetic design (Smyth and Wallace 2000). Recently, there is a shift from technological innovation to aesthetics that is based on discovering new opportunities in the marketplace. Companies are more focused on adapting new technologies and combining them in ways that create new experiences and values for customers. Cultural product design has received increased attention in the academic and business communities over the past decade. Both academics and practitioners had emphasized that the role of service design in innovative product development relates not only to aesthetics, but also to aspects such as ergonomics, user-friendliness, efficient use of materials, functional performance, and so on (Lin and Chang 2004).

The importance of studying aesthetic design is shown repeatedly in several studies in all areas of design field (Crilly et al. 2004). Despite the recognized importance of aesthetic design in cultural and creative design industries, they lack a systematic approach to it (Monk and Lelos 2007). Obviously, we need a better understanding of human-arts communications not only for the global market, but also for local design. While cross-cultural issues become important for product design in the global economy, the intersection of design and culture becomes a key issue making both local design and the global market worthy of further in-depth study (Lin and Lin 2010). Therefore, this study focuses on the analysis of art works in which the aesthetic elements are used. Then, a framework is proposed to provide designers with a valuable reference for designing a successful cultural product (Smyth and Wallace 2000). Results presented herein create an interface for examining the way designers communicate across art work as well as the interwoven experience of incorporating design and aesthetics into the design process.

2 Framework for Designing Art into Reality

According to communication theory, an art work must reach three functions to express its significance through the communication system. (1) Signification: the art work can express a kind of significance; that is, the artist's intentions can indeed be expressed through the art work. (2) Expression: the art work may represent the artist's and feelings; that is, through the art works, the artist's imaginations thoughts and feelings can be reproduced. (3) Communication: the art works of signification and expression can be sent to the audience only when the artist's thoughts are identical to the audience (Fiske 2013; Norman 2004).

Based on previous studies (Lin 2007, 2009, 2011; Lin and Chen 2012; Lin and Lin 2010; Lin et al. 2007, 2009), a research framework combining communication theory with a design model was proposed to explore the issue of turing arts into reality as shown in Fig. 1. Taking Mondrian's art works as an example, the research framework consists of three main phases: art paradigm, paradigm shift model, and cultural products. The art paradigm concerns selecting appropriate art works for the paradigm shift. The paradigm shift model focuses on how to extract artistic features from art works and then transfer these art elements to design practice. The design practice is composed of three phase; identification, translation and implementation, to finally design a creative product.

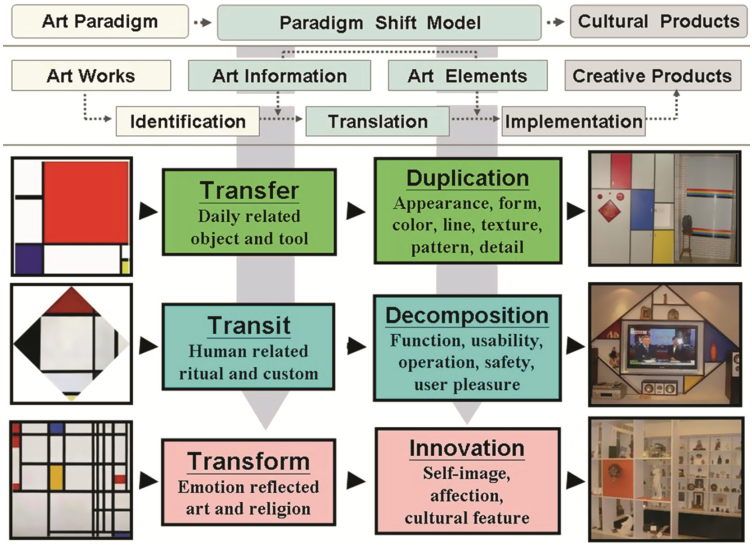

Fig. 1. The research framework for turning arts into reality

In the identification phase, art features are identified from an original art work including the outer level of colors, texture, and pattern; the mid level of function, usability, and safety, and the inner level of emotion, symbolic meaning, and stories. The designer uses the scientific method and other methods of inquiry and hence is able to obtain, evaluate, and utilize art information from the art work (Lin 2007). The translation phase translates the art information to art features within a chosen art work. The designer achieves some depth and experience of practice in these art features and at the same time is able to relate the art elements to design problems in modern society. This produces an appreciation for the interaction between arts, technology, and society (Lin 2007). Finally, the implementation phase expresses the art elements associated with the artistic features, the meaning of the chosen art work, an aesthetic sensibility, and the flexibility to adapt to various designs. At this time, the designer gains knowledge of an art work and an understanding of the spectrum of symbolic meaning and value related to it. The designer combines this symbolic meaning with his strong sense of art knowledge to deal

with design issues and to employ all of the art features in designing a cultural product (Lin 2007).

For design practices of the paradgim shift model, three levels are identified as: transfer, transit and transformation, which can be mapped into three levels of design features: visceral design, behavioral design and reflective design (Norman 2004). The key factor in the transfer level is duplication which concerns the appearance of an art work and transfers its form, textures, and pattern into a new product. The visceral design feature becomes important where appearance matters and first impressions are formed. The transit level which is behavioral design concerns how to transit the use, function, performance and usability from an art work. Based on the decomposition, the behavioral design feature is the key to a product's usefulness. In the transformation level, reflective design concerns feeling, emotion, and cognition of a cultural object. The reflective design feature is the most vulnerable to variability through culture, experience, education, and individual differences. Innovaton is the effectiveness factor, which is how to touch the audience and to take the right actions; that is, how effectively does the received meaning affect the audience.

For the framework, the designer focuses on the analysis of art elements in which the art work was used. Cultural product results from the art features that have been redefined in order to design a cultural and aesthetical product. The user's recognition is developed through interaction with the cultural product. Based on the cultural context, the designer expects the user's recognition to be identical to the design model through the culture aspect of interaction design. For the user's recognition, the user communicates directly with the cultural product. If the cultural product does not make the culture meaning clear and attractive, then use will end with the wrong message during the human-product interaction (Norman 1988). Thus, for the users, there are also three levels of human-product interaction: aesthetic experience, experience of meaning, and emotional experience. The aesthetic experience which is transfer level, involves a cultural product's form, color, texture, etc., to delight the user's sensory modalities (Crilly et al. 2004). The experience of meaning which is transit level, involves the user's ability including operation, safety, etc., to assign the design features and assess user pleasure with the cultural product (Desmet and Hekkert 2007). The emotional experience which is transformation level, involves user emotion including self-image, personal satisfaction, memories, etc., which are elicited by the art works and designed into the cultural product (Bermond 2008).

3 A Case Study of Turning "Mondrian" into "Interior"

The Piet Mondrian (1872–1944) was an important contributor to the De Stijl art movement and group (Warncke 1991). He created a characteristic and immediately recognizable style of painting and evolved a non-representational form which he termed Neoplasticism. His most famous compositions consisted of arrangements of colored fields and black lines over a white background, upon which was painted a grid of vertical and horizontal black lines and the three primary colors (Locher et al. 2005; Taft 1997). Some of the earliest experiments in computer graphics-based art mimicked some of

Mondrian's compositions, because its surface features are easily reproduced with computer algorithms (Noll 1995, 1966). Based on the research framework as shown in Fig. 1, the features of Mondrian's compositions would appear to be a good basis for reality visualization. The use of recognizable style and three distinguishable colors together with geometrical form seemed a good paradigm for turning "Mondrian" into "Interior" (Mondrian 1995, 2008).

Developing an aesthetic product involves more than considering the "culture" or "art work." Based on the art work, the aesthetic product should also fit into a context of "art work" or cultural meaning in use and meet user requirements (Dan 2013; Kujala et al. 2001). It remains a challenge to represent use contexts and user needs in a way that designers with art work backgrounds are able to make direct use of them. Using the framework as an approach, this paper explored Mondrian's art work, translating it into user needs and user requirements in aesthetic product design cases.

3.1 Turning "Mondrian" into "Interior" from the Outer Level

The design features derived from the outer level, which is visceral design concerning physical and material elements, focuses on Mondrian's composition that if color represents meaning and expression it has to be a universal, general meaning formulated in every separated color and specified in the relation unity of image which is associated with material, colors, texture, and pattern. Mondrian expressed that Unity and relationship are the determinants in the roots of the meaning in colors (Dan 2013; Locher et al. 2005; Taft 1997).

The identification phase attempts to determine user needs. Considering the situation in Taiwan's apartments, there are many utility meters, such as water, electricity, gas as shown in on left of Fig. 2, which make disorder and a mess along a long narrow passage. Furthermore, the hydrant that supplies water to extinguish fires is very important for safety. The hydrant must be visible during a fire as shown in the left of Fig. 3, but may be invisible otherwise.

Fig. 2. Storage for utility meters

Fig. 3. Storage for hydrant

In the translation phase: the analysis of the color and form could provide the designer with an idea of how to transfer the Mondrian's work into interior design. There considerable graphic documentation about Mondrian's Post-Impressionist period, especially in form and color. For example, his painting *Avond* (1908) shows a color palette consisting almost fully red, yellow and blue colors (Barriga 2011). It was the first Mondrian's work that emphasized only the use of primary colors. In this way, Mondrian eliminated all what was formal in pictorial image. He expressed that modern painting did not have to be figurative and it did not have to be implicated in representation of apparently real objects; but that painting had to be a searching of what is absolute, and that is found hidden behind real forms. In summary, his aesthetic thought was based on the searching of a pure art. Furthermore, Mondrian's art work emphasizes the meaning of harmony and order in reality.

In the implementation Phase: From a usability point of view, the designer used Mondrian's color and form for rearranging the utility storage as shown in the Fig. 2. Figure 3 shows the idea that derives from Mondrian's art work to show he meaning of harmony and order in the hydrant storage.

3.2 Turning "Mondrian" into "Interior" from the Mid-Level

The mid-level which is behavioral design focuses on the behavioral level including function, usability, and the scenarios in which people would use the "Mondrian" on different occasions. For example, Holmquist and Skog (2003) found the Mondrian's compositions to be a good basis for abstract information visualization. The use of three easily distinguishable colors together with geometrical shapes seemed ideal to visualize dynamic data concerning e-mail traffic, current weather, weather forecasts, and most recently bus departure times. These are typical examples of turning "Mondrian" into "visualization" in that data has been mapped to the size, position, and color of the fields in a composition. From the usability point of view, the "Mondrian" is a special interface used in the ambient information visualization (Holmquist and Skog 2003). Therefore, the design features on the middle level of the "Mondrian" should be focused on how to express its function based on ergonomics.

In the identification phase: What are the user needs? We need storage room in our living space, such as TV case, book shelf, cabinet, closet etc.; In addition, the user needs a projection screen and a whiteboard for teaching and writing. Therefore, the method of turning "Mondrian" into "Interior" from "ideality" to "reality" becomes an important issue at mid -level.

In the translation phase: taking Mondrian's compositions series 1917–1940 as an example, the composition series also called "Neo-plasticism" (Troy 1979) which want to emphasize the art meaning that artists want to express, but tries to balance the relationship between the form and the art meaning (Fendelman and Taylor 1999). In that time, it is necessary to emphasize the appearance because the appearance that will tell audience whether a work actually expresses a pure plasticism of the universal. Execution in ideality is to art what action in reality is to life. It is noted that people from different cultures use different ways to understand Mondrian's composition representing different cultural meanings. Within these cultures, they may share some differences and similarities in turning "ideality of Mondrian" into "reality of interior" either the form or the art meaning. "Ideality" and "reality" between the form and the art meaning are the crucial elements for the core value of the Mondrian's composition.

In the implementation phase: for the mid-level in Neo-plasticism appearance, the most external means for the expression of form and natural color are internalized and thus rendered equivalent to the pure plastic means of essence. The essence of Neo-plasticism is more important than external appearance. For example, Mondrian's "Composition 2" (1922) (Locher et al. 2005) is composed of rectangular form with colors as shown in Fig. 4. These rectangular color planes express harmony which is the nature of Neo-plasticism. Based on "Composition 2," Fig. 5 shows how to turn "Composition 2" into "reality" as a projection screen or a whiteboard for writing. Consequently, Fig. 5 shows how to combine Mondrian's art works – Tableau No. IV: Lozenge Composition with Red, Gray, Blue, Yellow, and Black (1924/1925), with "Composition With gray and Light brown 1" to design a TV case and book shelf together (McManus et al. 1993).

Fig. 4. TV case and book shelf from Mondrian's "Composition 2"

Fig. 5. TV case and book shelf from Mondrian's "Tableau No. IV"

3.3 Turning "Mondrian" into "Interior" from the Inner-Level

The inner-level which is reflective design contains special content such as stories, emotion, and cultural features, and focuses on the symbolic meaning of the Mondrian. In general, the Inner-level interface of the Mondrian is derived from the symbolic meaning of color. The reflective design focuses on the Mondrian's work that is closely linked to a spiritual and philosophical interest. His art was linked to the theosophical movement (Blavatsky 2012) which studied reality on the basis of mysticism.

The identification phase asks: What are the user needs? The author traveled all over the world and collected many souvenirs and other collections representing their memories in different countries. So, the user needs a space for keep these materials not only for display but also for memory. Mondrian was interested in esthetic and theoretical thinking that creating happiness and harmony in the inner and the outer of his works. He found a theoretical support for the development of his plastic activity, and knew a different kind of beauty: one that he creates himself, and that in nature appears only under a veil (Barriga 2011; Dan 2013).

In the translation phase, Mondrian expressed that if color represents meaning and expression, it has to be a universal meaning and formulated in every separated color and specified in the relational unity of image (Fendelman and Taylor 1999). For instance, unity and relationship are the determinants in the roots of the meaning in color. Mondrian offered no opinion on the question of whether color carries an inner meaning of its own. He needed to make the universal visible which forced him to keep available the possibilities of the pure and saturated color. Then, Mondrian used the concept in all of his works. From the beginning of the twentieth century, the esthetic-semiotic thinking currents started to be interested in language pictorial representation, by means of symbols and signs, both in abstract and figurative painting, design and architecture. Although arts are based on communicative elements, they cannot be studied exclusively through aesthetic or semiotic cases (Barriga 2011). Though Mondrian was not interested in symbology of form, his philosophical studies were based on geometric abstraction looking for the basic structure of universe. The main concept that tries to represent simplicity and harmony with the white background crossed by a lines grid of black color and the blocks of primary colors were considered by Mondrian as the basic colors of the

universe (Taft 1997). For examples, Mondrian's art works Composition London (1940), Composition 8 (1939), Composition with black yellow and red (1939), and Composition in Blue (1937) are shown in Fig. 6 (Locher et al. 2005; McManus et al. 1993).

Fig. 6. Memory closet from Mondrian's "Composition 2"

In implementation phase, based on the previous composition, the original idea showed at the left of Fig. 6. Although the idea expressed the structure of Mondrian's composition, it was too complicated to express the inner meaning of Mondrian's composition. After modifying, the final "Memory" closet is shown at the right of Fig. 6.

3.4 Designing "Arts" into "Product Design"

Designing "Arts" into "Product Design" will be a design trend in the global market. This is not a new idea; for example, Rietveld founded his own furniture factory in 1918. He involved the current scientific theory, mechanical production, modern city rhythms and Stijl moment's theories, in a conceptual development of form. In 1918, he designed *the red and blue chair*, considered as a true art work by generations of designers, and a product design paradigm. (Billinghurst et al. 2001; Van Zijl 1999). On the other hand, E-business is considered to be one of the pivotal components in cultural and creative design industries which have a significant impact on consumer perception of innovation. Lin (2009) proposed an ABCDE business model for turning "Aesthetics" into "Business": we need "Creativity" and "Design," then put the results of ABCD in E-business. It is a new approach that integrates design, culture, artistic craftsmanship, creativities and service innovation design in cultural and creative design industries.

For the local design, Qualia has gained popularity and broad application in product design. "Qualia" is a Latin adjective that refers to quality and comprises five elements: attractiveness, beauty, creativity, delicacy, and engineering. The sense of difference lies in quality, which includes attractiveness, beauty, and creativity, in which content renders the product surface (Yen et al. 2013). Attractiveness, beauty, and creativity belong to the emotional condition of the product "psychology"; delicacy and engineering belong to the rational condition of the product "physiology." Thus, qualia products involve rational conditions for consumer use but do not neglect emotional appeal (Mandler 2005; Bermond 2008). Taking Mondrian's art works as an example, the author turned

them into "real products." including Dining Table, Coffee Table, and Corner Table as shown in Fig. 7 from left to right.

Fig. 7. Examples of turning "arts" into "product design"

4 Summary

Understanding how to turn "Arts" into "Business" for "Creativity" and "Design", and E-business for creative industries are important research issues. Those issues are not so well covered until now. Therefore, based on the e-business, this paper proposes a research framework for illustrating how to transform "art" into "e-business", and design these aesthetic features into modern products to reinforce their business value. The framework of human-arts interaction provides a different way of thinking about interactive experiences with aesthetics. The most important part of this process is the user experience added into the cultural product design process and involved aesthetic design considerations. The framework is of value for designers because it can help to design "art elements" into aesthetic design, as well as provide users with a valuable reference for understanding aesthetic meaning. Results presented herein create an interface for looking at the way arts crosses over into product design, as well as illustrating the interwoven experience of arts and creativity in the innovation design process.

Along with Information Technology progress, e-business is becoming the most common concept in the Internet and electronic commerce world. However, in today's intensely competitive business climate, innovative products become central in e-business development. To be successful, innovative products must have a clear and significant difference that is responding to a marketplace needs. Furthermore, changes in consumer perception regarding aesthetics are also important in product design. For future studies, we need a better understanding of the acculturation process not only for the aesthetic in local design, but also for the user needs in the global market. While aesthetic features become important issues in the interactive experiences of users, the acculturation process between human and arts becomes a key issue in the cultural product design and are worthy of further in-depth study.

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