

DEVELOPMENT OF GRAPHIC SYMBOLS BASED ON TROPICAL PLANT IMAGES IN DECORATIVE TILES PRODUCTION

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ABSTRACT

The most important aspect of choosing tile is the pattern design. Therefore the importance of focusing the production process in design has become crucial. The biological, physical and visual aspects of environment influence life philosophy, culture, society, tradition and creativity development. In the production of design symbols, it is evident that there is lack of focus and assessment given to the production process compared to that of the end product. The importance of the transformation process is emphasized by Wallschlaeger and Cynthia Busic-Synder who believe that the problem solving processes are shown to illustrate how the process can be altered for use in solving specific types of problem in design. Therefore, the objectives of this research are to determine the significance of systematic design process and ideas transformation in the development of graphic symbol. This study explores the relationship between tiles production and its pattern within an activity theory framework, focusing on data collected using questionnaires survey from selected universities in Peninsular Malaysia and interviews at Design Department of selected manufacture in Peninsular Malaysia. At the conclusion of this paper, a design criteria and analysis of system will be developed before production process of decorative tiles design from tropical plants images.

1 INTRODUCTION

This study focuses on analysing how the transformation process occurs and how to design an effective manual system. It requires the understanding of the relevant definition of the concept of transformation in accordance with changes in applications and technology, especially in the context of design research. Nature processes distinctive potential resources in the production of design process and innovation. The potential of environmental resources such as tropical plants can contribute to design production. In Malaysian context, tropical plants are closely related to the daily life of the people, and also one of the most favourite subject matter used in ceramic tiles design, as a symbol or pattern on the surface. In the production, a broad range of tiles varying in dimensions, dimensional tolerance, strength, apparent porosity, surface texture, decorative coatings, and overall quality are produced by the tiles industry. Since tile have high ratio of surface area to thickness, the element of constructing graphic symbol involving tropical plant images as motif, is become crucial. For thousands of years, artists have relied on the natural world for inspiration, especially designers of pattern in our modern world. Floral pattern designs were chosen because flowers have traditionally been depicted in artwork and decoration since the beginning of visual communication. The artists of the Art Deco style, despite their emphasis on geometric rather than organic line, followed in the longstanding tradition

and placed great importance on the floral motif in fabric patterning. In fact, at the peak of Art Deco, over half the fabric designs produced depicted floral imagery, most of which was treated geometrically.

2 Literature Review

2.1 Design Transformation Process

The term transformation is also used in the context of the mind to visual interpretation in the communication process as explained by Paul Laseau (2001: 8) where the process of graphic thinking can be seen as a conversation in which it can be communicate through sketches. The communication process involves the sketched image on paper, the eye, the brain and the hand.

Alan Powers (2002: 36) relate the term transformation of nature through his statement:

- a. The transformation from the point of thinking and creativity. This relates to how we stimulate ideas and thinking in the development of the mind. Here, the transformation process in the brain, followed by members of the body before translated into paper or by computer.
- b. The transformation of the visual angle and design. The process is divided into two aspects namely physical (elements) and meaning (principles). Physically, the transformation process created in the form of the size, shape, form, fabric and color. In terms of meaning (principles), it was translated by nature good or bad, soft or hard, balance etc.
- c. The transformation from the perspective of the nature or character of the environment, such as small or big, fast or slow, smooth or rough etc.

Charles Wallschlaeger and Cynthia Busic-Synder (1992: 23) also agreed with the above statement and explain that the process described a series of events, stages or phases that can be viewed in a variety of ways. It is planning and organizational tool used to guide creative activities toward an end goal. The above author through his book 'Basic Visual Concepts and Principles' (1992) emphasized the importance of creation versus process

through the passage: "The problem solving processes are shown to illustrate how the process can be altered for use in solving specific types of problem". Based on the discussion, it can be concluded that natural resources such as plants have the potential to be an innovative sources that can provide guidance to the understanding of transformation process of design, principles of aesthetic design and result's evaluation.

2.2 Graphic Symbol in Tiles Design

Innumerable designs on surface in homes, workplaces and shopping malls have become computer-based. From the lowly flat surface design of toilet signage, advertisement and ceramic tiles, to different audio-video appliances together with animated applications, and all of these have become equipped with more complex functions. In the midst of these complex applications and the human attempting to utilize are the graphical symbols. In general, a symbol is any graphical character or other representation. It is intended to (a) stand for something else, (b) communicate a use for an object/structure, or (c) communicate what should or should not be done at a given time or location (Stramler, 1993). Graphical symbols, in turn, usually pertain to terms like icons, and pictograms or pictorial symbols (Bocker, 1993). The former refers to symbols that are simple, concrete and usually self-explanatory of the ideas, objects or functions they represent (Wood and Wood, 1987). There is a growing demand for finely detailed ornament symbol design, but there has been no way to design and produce affordable custom ceramic tiles with complex geometric and organic symbol (Mckee, 1990). However, decorative ceramic tiles are manufactured in vast quantities, with wide application in both domestic and commercial setting in 1998. Although tile production has increasingly been subject to the introduction of automated technology, with high speed lines approaching production rates in the order of 200 tiles/min, the control of tile quality, has often remained essentially a manual operation. This lack of automation is particularly evident in the inspection of more 'difficult' complex surface and texture designs, where the presence of undetected surface cosmetic defects often tends to convey an impression of poor quality, leading to unacceptability and resulting loss of sales and profitability (Smith and Stamp, 2000).

2.3 *Design Criteria*

However, an improperly designed symbol can degrade the merits listed which have been discussed. Two common problematic concerns regarding icon design are: firstly, symbols often have language barriers that do not ensure instant comprehension across, or even within cultures (Waterworth, 1993; Manes, 1985; Karfhage and Karfhage, 1986); secondly, people cannot quickly locate the symbols they need (Gittens, 1986; Wickens, 1992). Many principles, criteria and guidelines for symbols have been proposed to qualify the design of symbols (Marcus 1984; Tognazzini, 1992; The CD-I Design Handbooks, 1992). In addition, according to Schenk (1991), graphic designers need to develop the ability to use drawing to support a wide range of tasks, which include as key-hold as criteria for design. Drawing is a tool helping them to perform managerial tasks, achieve creative output and control production. It is also the key to making essential communications about designedly issues with a variety of people including clients and other members of the design team. While many excellent manuals and monographs identify and explore much of the specific nature of the graphic design discipline, the characterization of all the particular ways in which graphic designers use drawing has hitherto been somewhat neglected in the literature (Schenk, 1989). Examples of good graphic design production are widely available through the many annuals and specialist journals that deal with the subject, but examples of the preparatory stages of the solutions are very rarely seen. For the most part, the drawn stages, the progressive sketches, still remain hidden from view.

2.4 *Tropical Plant Images*

For thousands of years, artists have relied on the natural world for inspiration, especially designers of pattern in our modern world. Floral pattern designs were chosen because flowers have traditionally been depicted in artwork and decoration since the beginnings of visual communication (Hubbard, 2009). The artists of the Art Deco style, despite their emphasis on geometric rather than organic line, followed in the longstanding tradition and placed great importance on the floral motif in fabric patterning. In fact, at the peak of Art Deco, over half the fabric

designs produced depicted floral imagery, most of which was treated geometrically (Hardy 2003).

3 RESEARCH METHODOLOGY

3.1 *Materials*

A questionnaire which included 12 items to be rated on the elements and principles in transforming tropical plant symbol design on tile. Table 1 lists the 12 items with their brief descriptions. The questionnaire was developed in the following manner. First, a set of 10 decorative tropical plant symbol designs was prepared based on pilot studies with twenty design based students from the Department of Industrial Design, UPM and Graphic Design Department, UiTM. Then, two experienced professional tile designers were recruited to analyse and synthesize these principles, criteria and guidelines. Each designer was allowed to add or delete any design elements to develop the list of design guidelines. Then, the designers met, and after extensive discussion of their work, constructed the 12 items questionnaire.

3.2 *Subjects*

Thirty-three graphic and industrial designers completed the questionnaire: 18 were male and 15 were female.

3.3 *Data Analysis*

Data is collected from the survey conducted. Results presented are obtained from the statistical analysis generated by Statistical Program for Social Science, SPSS 15.0. Simultaneously, this part discusses on the findings driven by the objectives highlighted in the study.

4 RESULTS AND DISCUSSION

Table 2 contains the elements of design guideline which have been analysed. From the analysis, we have identified 3 main categories: process transformation from tropical plant to symbol design, process transformation from symbol to tile and consumer's perceptions. Compared with the

previous findings and literature, the results of this study were more specific and more suitable for guideline to design a proper tropical plant symbols on tile.

Table 1: The 12 design elements and brief descriptions

No.	Element	Description
1	Types of style	How significant is style of pattern in tiles design
2	Transformation of plant images	The elements that characterize the transformation of plant image on tiles
3	Application for plant images	The element of shapes that should be applied on tropical plant images
4	The structure of transformation	The process of constructing petals as symbol design
5	Structure of tile's symbol design	The elements that can be applied during the process of constructing symbol on tile
6	Characteristic	Characterize the form of flower in symbol design
7	The elements	Importance of elements in interior and exterior design
8	Symbol design	Characterize petals in symbol design on tile
9	Criteria motif on symbol design	The rating of geometrical symbol design
10	Criteria motif on tropical plant	The rating of the effectiveness of motif used
11	Layout	The rating of the effectiveness of motifs used based on its alignment and layout
12	Aesthetic elements	The rating of the effectiveness of motifs used based on its aesthetical elements

4.1 Balance

Balance can be defined as balance refers to the ways in which the elements of design are arranged in a piece of an artwork (Ngo, Teo and Byrne, 1999). Balance of symbol design in tile is achieved by providing an equal weight of layout, left and right, top and bottom. Fig. 1 presents the layout of tropical plant symbol design versions in balance study. Fig.1 presents a balanced tropical plant symbol design in which half of the weight is roughly in one side of the layout and half is on the other.

4.2 Sequence

Sequence in design refers to the arrangement of objects in a layout in a way facilitates the movement of the eye through the information displayed.

Perceptual psychologists have found that certain things attract the eye. It moves from big objects to small objects. Fig. 2 presents the tropical plant symbol design versions in sequence study.

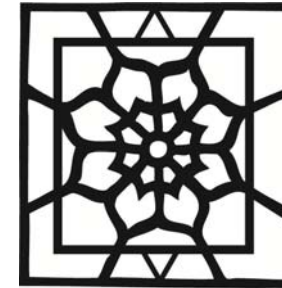


Figure 1: Layout of balance tropical plant symbol

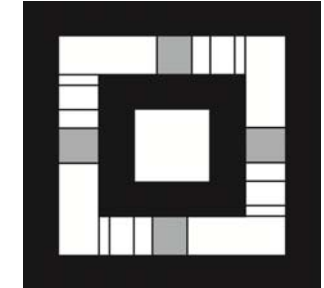


Figure 2: Layout of sequence tropical plant symbol

4.1 Unity

Unity is coherence, a totality of elements that is visually all one piece. With unity, the elements seem to belong together. Unity in symbol design is achieved by using thick and thin lines and leaving less space between elements of a symbol than the space left at the margins. Fig. 3 present the tropical plant symbol design versions in unity study. In Fig. 6, unity is achieved by leaving less space, and the elements are grouped together surrounded by white space.



Fig. 3: Layout of unity tropical plant symbol



Figure 4: Layout of simplicity tropical plant symbol

Table 2: Loadings of elements on the 3 main categories after data analysis

Categorization : Process transformation from tropical plant to symbol design			
No	Element	Item	Hits
1	Types of style	Geometric shape	87.5
		Organic Shape	75.0
		Abstract	58.3
		Traditional	50.0
		Urban	41.7
2	Transformation of plant images	Petals	87.5
		Leaves	75.0
Categorization : Process transformation from symbol to tile			
3	Application for plant images	Geometric shape	75.0
		Organic shape	87.5
4	The structure of transformation	Simple and clear	75.0
		Containing message	87.5
		Describable	75.0
		Memorable	87.5
		Scalable	87.5
5	Structure of tile's symbol design	Balance structure	75.0
		Flow of lines	87.5
		Strong form	75.0
		Simple form	87.5
		Dominant form	87.5
		Utilization of space	87.5
		Repetition of forms	87.5
6	Characteristic	Flat surface of symbol design	75.0
		Emboss symbol design on selected areas	87.5
		Contrast colour for dominant shape	75.0
		Glaze on embossed area	87.5
7	The elements	Line	75.0
		Colour	87.5
		Space	75.0
		Size	87.5
		Symmetry	75.0
		Direction	87.5
8	Symbol design	Centre as first point	75.0
		Combination of triangle and circle	87.5
		Expanding rectangle shape	75.0
		Implementing round shape as basic form	87.5
		Each shapes in symmetrical order	75.0
		Repetition of each shape	87.5
Categorization : Consumer's perception			
9	Criteria motif on symbol	Good first impression	75.0

design	Clean and nice look	87.5	
	Well structured	75.0	
	Simple and clear	75.0	
10	Criteria motif on tropical plant	Appropriate size	87.5
		Good placement	75.0
		Negative and positive spaces	
		General layout and use of space	75.0
11	Layout	Complexity and use of grids	87.5
		Effective use of layers	75.0
		Use borders and dividers	75.0
		Colour harmonies	87.5
		Ease of use	75.0
12	Aesthetic elements	Clarity and simplicity	87.5
		Professional appearance	75.0
		Artistic integration	75.0

4.2 Simplicity

Simplicity is directness and singleness of form, a combination of elements that results in ease in comprehending the meaning of a pattern. Simplicity in symbol design is achieved by optimizing the number of elements on symbol and minimizing the alignment points. Fig. 4 presents the tropical plant symbol design versions in simplicity study.

4.3 Regularity

Regularity is a uniformity of elements based on some principle or plan. Regularity in symbol design is achieved through consistent spacing and grouping of components. While both simplicity and regularity depend on the numbers of horizontal and vertical alignment points, unlike simplicity, regularity is less sensitive to the number of elements on the layout. Fig. 5 presents the tropical plant symbol design versions in regularity study.

5 CONCLUSION

In this paper, we have presented a design theory of developing design guidelines in designing symbol on tiles based on tropical plant images, as motif. In particular, we have introduced 12 design elements as guidelines: types of style, transformation of plant images, application for plant images, the structure of transformation, structure of tile's symbol design,

characteristic, the elements, symbol design, criteria motif on symbol design, criteria motif on tropical plant, layout and aesthetic elements. Having a way of objectively defining and measuring the qualities of these elements could help us to more reliably design tropical plant symbols that have these qualities. However, we would like to emphasize that these are preliminary data that need to be expanded upon.



Figure 5: Layout of regularity tropical plant symbol

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