

PRODUCT SUSTAINABILITY AND EMOTIONAL DESIGN

Pantea Ioan*

*University of Oradea, e-mail: ipantea.uo@gmail.com

Abstract

People's concern for beauty and comfort has highlighted over time the relationship of interdependence between the aesthetic and the functional, leading to the emergence of the concepts of environment, ambient, habitat, object, which today governs many aspects of the everyday life. An individual, being a living being, instinctively inclines to all that is natural, organic, and rejects all that is unnatural. Therefore, any object created naturally or artificially is considered beautiful when it meets the rules of organic, natural proportionality. An object is harmonious, it has a pleasant appearance, when it is well proportioned, when between the component parts and the whole there are judicious dimensional ratios that increase its aesthetic value. The reports that best respond to these desiderata are the reports that respect the natural laws of proportionality. The purpose of this paper is to construct the graphic design of an object, in a horizontal plane, using the harmonic network of the pentagram, in order to create harmony, the scale balance between one element and another or between an entire object and one of its parts. The sustainable emotional design links the principle of emotional design to sustainability.

Key words: sustainability, product design, golden rule, pentagram

INTRODUCTION

The affective design is a branch of the ergonomic thinking that deals with the emotional effect that a product has on a user based on the interaction with him. It is how a product "affects" a person, and which results in an emotional or behavioral response through its attributes. The goal is to provide products that, for example, delight. Emotions can, however, be volatile or transient, leading to products whose attributes soon fade. If a person has a strong enough emotional attachment to a product, then they are less likely to throw it away. (Pantea, 2019)

The understanding and applying of the concepts of sustainability is becoming a necessity in a world that is trying to cope with the demographic pressures, the degradation of the natural environment, and the scarcity of the available resources or the instability of the financial markets. Companies need to integrate sustainability into their processes and strategies in order to effectively meet new challenges. The performance measurement and evaluation must include social, environmental and economic indicators. These issues need to be integrated and managed in a balanced way in order to understand the sustainability of a product from the perspective of all the interested parties. The consumer is not interested in the profit margin but is

interested in the effects of the purchased products on his health, considering them more and more seriously in the purchase decision.

MATERIAL AND METHOD

In composition the most important concept is the concept of proportion, it refers to the relationship between the visual and the elements. The proportion is the scale, the amount of the degree of dominance or subordination between the visual elements, it can create order. The gold section aims to achieve a harmonious proportion, which plays an important role in creating the harmony of the construction, so the previously thought-out reports can create a unique, pleasing image for the viewer (Pantea, I., 2019). In order to make the pentagon, it is built a circle with perpendicular axes. Divide the radius OB into two equal parts obtaining the point K (figure 1). With the leg of the compass in K take the radius KG in the compass and draw an arc of a circle from G to the horizontal axis of the circle obtaining the point L, which folds on the circle in the point M (figure 2).

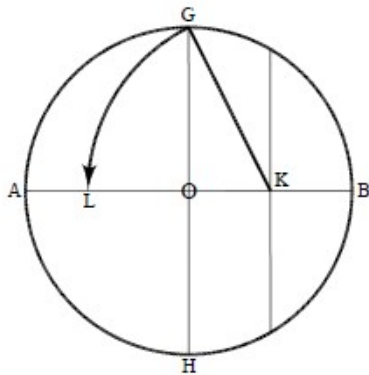


Fig. 1 Pentagon construction

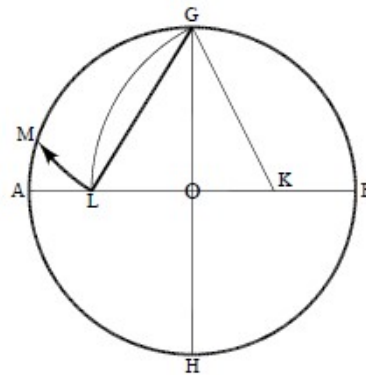


Fig. 2 Tracing the side

The GL segment represents the side of the pentagon (figure 3). Draw the diagonals NG and PG inside the pentagon (figure 4). If the side of the pentagon is 1, the NG diagonal is equal with φ ($= \sqrt{5} / 2 + 1/2$ or 1.618034 ...). The side and the diagonal of any ordinary pentagon are in ratio 1: φ (figure 4). The analysis is done according to Pythagoras' theorem. To understand the φ inherent proportions of the pentagon, we must consider the right triangle 1/2:1 or 1:2 which initiates its construction $KG = \sqrt{5}/2$ (figure 5)

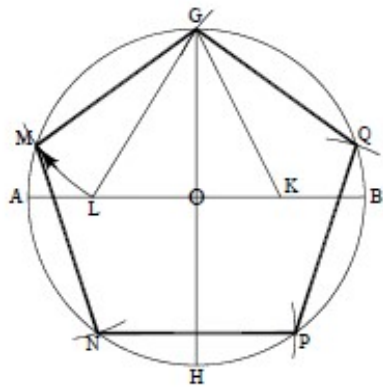


Fig. 3 Folding the side of the pentagon on the circle

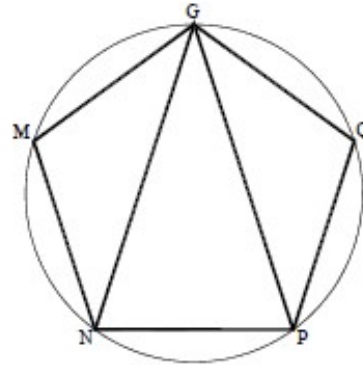


Fig. 4 Golden triangle

In figure 6 we meet the gold section. (Fletcher R., 2006, 72)

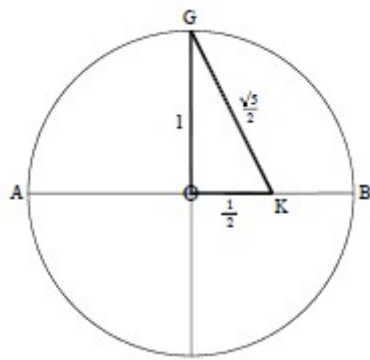


Fig. 5 Pythagoras' Theorem

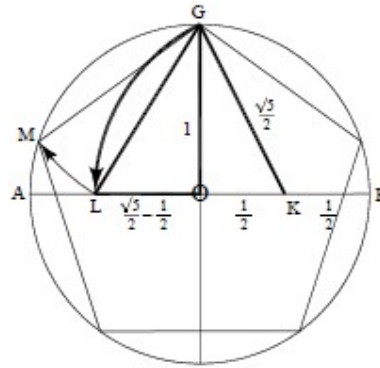


Fig. 6 Golden section

Each segment of a common pentagonal system refers to the others as a function of the variable ϕ . If the pentagon GMNPQ and its five diagonals are drawn, the PN side of the pentagon is 1, the diagonal NG is equal to ϕ (figure 7). If the SP segment is equal to 1, it results that $RS = 1/\phi$, $PN = \phi$ and $NG = \phi^2$. The segments grow simultaneously in geometric proportion. (Fletcher, 2006,)

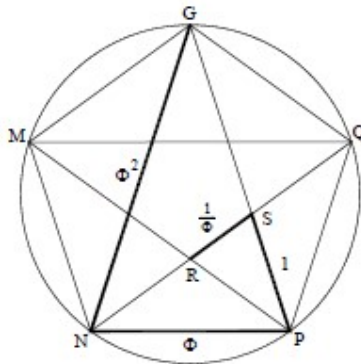


Fig. 7 The golden triangle and the pentagram

RESULTS AND DISCUSSION

To achieve a visual balance in the design of any type, we can use the number 1.618033. Whether we accept it or not, behind any balanced element, we run into a mathematical calculation. This number represents the golden number or the golden section, and through its prism we obtain a pleasant aesthetic, being at the same time in relation to the human being. To build the harmonic network, the inverted pentagon is also drawn, with the tip down over the normal pentagon. We draw the diagonals forming gold triangles (figure 8). We mark the harmonic points of interest on the network of the pentagram created (figure 9). From these points, we build with the compass circles with the obtained radius, making the connection between the arcs of the circle.

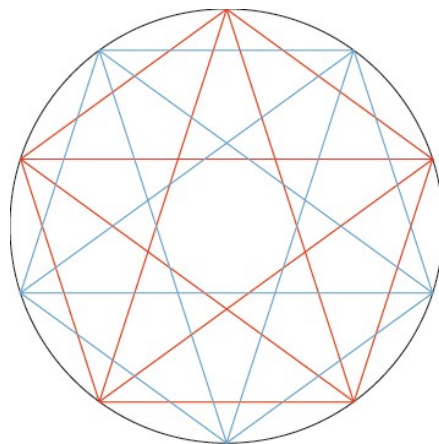


Fig. 8 Drawing the pentagram

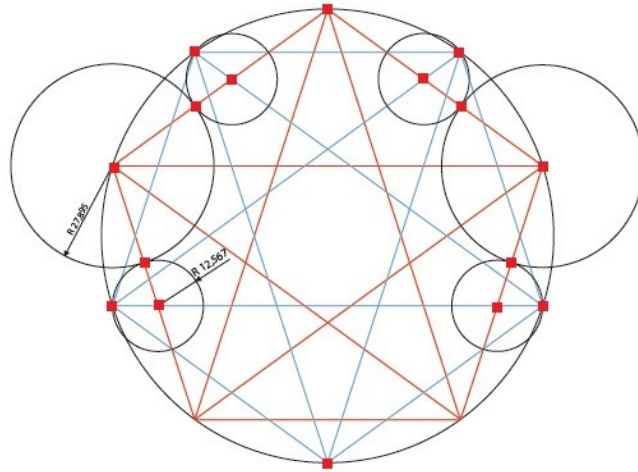


Fig. 9 Connecting the circle arches

A geometric figure is obtained consisting of arcs of a circle that have the center of the circles in the harmonic points of the pentagram and that form the contour of the horizontal surface of the carafe in the upper part (figure 10).

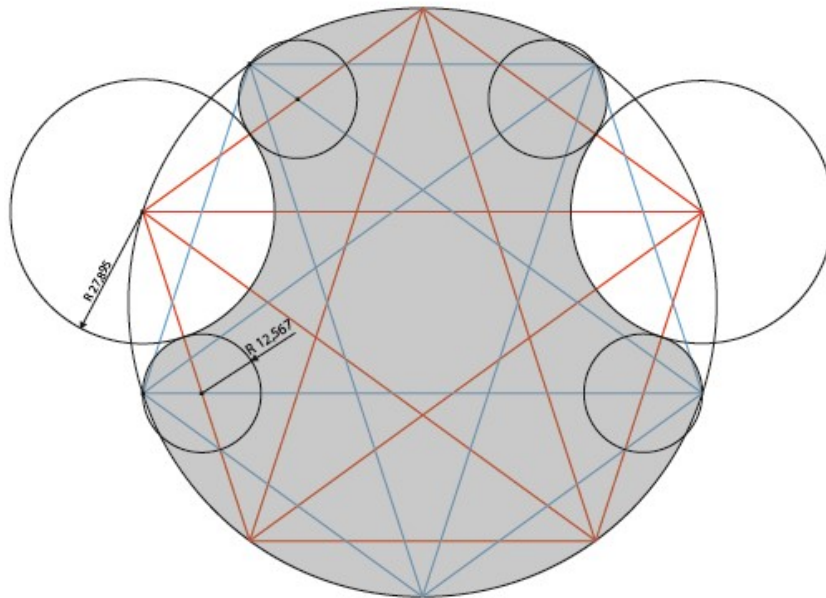


Fig. 10 The contour of the horizontal upper surface of the carafe obtained according to the harmonic network of the pentagram

CONCLUSIONS

The geometric organization itself does not produce the dynamic concept of inspiration. What the creative idea offers is a process of composition, a means of interrelating form, and a method of achieving visual balance. It is a system of uniting the elements into a unitary whole. The "golden section" aims to achieve a harmonious proportion, which plays an important role in creating the harmony of the construction, so the previously thought-out relationships can create a unique, pleasing image for the viewer.

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