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APPLICATION OF GOLDEN RATIO IN INCREASING THE APPEAL OF PROPORTIONS IN DESIGN

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ABSTRACT

The main objective of this paper is to assess the accuracy and proportionateness of logo design while maintaining the aesthetic value of the original logo design. For this study, the Phi Matrix Golden Ratio software was used to understand better and deepen the calculation of the proportion in the golden ratio in creating a logo. This software makes it possible to designate a precise proportion for the logo during the entire creation process. Local business will benefit from this research when it comes to creating company logos.

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1. Introduction

The logo design produced by the designer is not just a mere sketch. All of them are arranged according to a composition that has been arranged in a particular method so that a design is in the correct proportion. There are well-known companies such as (Calisir, 2019)Apple that choose a much simpler logo with only a bitten mark of an apple. From 1976 to 2018, the logo underwent a revolution. However, the image of the apple remains the basis of the logo.



Figure 1: Apple Logo Evolution (Logo Source: Apple Inc)

When branding a product, the logo is essential. The symbol is able to facilitate international communication because of its universal symbol nature(Kohli & Suri, 2002). According to Colman, Wober, & Norris, (1995), businesses spend a lot of time and money developing their logos. Scholars have previously conducted several studies on how to create a successful logo. Although there is an expectation that well-designed logos will influence brand communications, the deep research on the role of logos in branding is limited. Therefore, researchers conducted studies on logo design and discussed relevant design theories, such as Verzyer's aesthetic response theory (Veryzer, 1993) and divine proportion using the golden ratio.

2. Literature Review

2.1 Logo

The term of logo can be refered as a form of visual communication design work that contains a picture or sign that is used as an identity to create an image of a character such as an institution, a company as well organisation (Henderson & Cote, 1998). A logo's functions must ensure that the message is communicated, received, and translated to the general public (Adîr et al., 2015). According to Adîr et al. (2015), the functions of a logo have to ensure the communication of the message, the reception, and the translation to the public, and specifics should include contact information to ensure and support communication between the organisation also the public. Additionally, the logo can explain and define the organization's identity also personality through information sharing; the logo provides information about the product/service/event and identification to identify the intended users. Translation encrypts the message, while aesthetics refers to a person's sensibility and emotion.

2.2 Golden ratio

Many artists and architects have used the golden ratio in their work, particularly in the golden rectangle, at least since the twentieth century. The golden ratio is defined as the longer

side ratio to the shorter side ratio, and it is thought to be aesthetically pleasing. The special proportioning properties of the golden section have a close relationship to a sequence of numbers called the Fibonacci sequence, named for Leonardo of Pisa who introduced it to Europe about eight hundred years ago along with the decimal system. This sequence of numbers, 1,1,2,3,5,8,13,21,34...., is calculated by adding the two previous numbers to produce the third (Elam, 2001). The Golden Ratio is a universal law that contains the (Elam, 2001) fundamental principle of all formative striving for beauty and completeness in both nature and art, and which pervades all structures, forms, and proportions, whether cosmic or individual, organic or inorganic, acoustic or optical; but which finds its fullest realisation in the human form. There is a common mathematical ratio that can be used to create visually appealing, natural-looking logo compositions in nature.



Figure 2: Fibonacci Number Sequence

3. Methodology

The geometric analysis using phi matrix golden ratio design and analysis software was used by Mohd Yusof & Hasan (2016) in car dashboard design as to identify the virtuous proportion in design.



Figure 3: Large (ab) and Smaller (bc) Segment & Golden Ratio Spiral

The golden ratio is the ratio between two segments such that the smaller (bc) segment is to larger segment(ab) as the large segment (ab) is to sum of the two segments (ac), or bc/ab = ab/ac = 0.618 (Lidwell et al., 2010). Therefore it was used as a basic reference in the shape of a circular

plane displayed in the form of spiral segmentation used to map the shape used in the logo as in Figure 4 and Figure 5.



Figure 4: Circle of Golden Spiral

Figure 5: Golden Section: Fan Template

The divine proportion was achieved by combining the original logo with a golden ratio circle, which was then arranged in lines. With the shape that has been obtained, the number of circles used is 1 circle F8, 1 circle F7, and 1 circle F1 and F2. Each circle is marked with a different colour to facilitate the process of sorting.

After that, smooth and adjust the pre-arranged circle areas to the desired shape. To make the field selection process easier later, give heed to the overlapping elements during the preparation.

4. Results And Discussion

The analysis of Phi Matrix Golden Ratio Design and Analysis showed that the existing fan logo A2 was less proportioned as most of the points and lines of the fan did not fall between the golden ratio scale lines.



Figure 6: Phi Matrix Analysis (Before) (Logo Source: Habhal's Cap Kipas Udang

A is the field ses have been grouped and adjusted according to the Golden Ratio scale.A2 showed the fan logo was less proportioned, as most of the points of the fan did not touch the Golden Ratio scale line.

Meanwhile, Figure 7 showed the logo, which was adjusted using the golden ratio circle B2, which showed that it was perfectly proportioned after analysis of Phi Matrix Golden Ratio Design and Analysis has been done. However, researchers recommend that designers conduct a phi matrix study prior to designing a logo and that any changes to the logo be made to the actual logo to scale the measurements according to logical and accurate proportions.





B1, the template created using the Phi Matrix Golden Ratio Design and Analysis, demonstrates that the logo design's perfections were adjusted. B2, the fan logo was perfectly proportioned as most of the fan point's fall within the golden ratio scale line.



Figure 8: Before and After logo proportion process

Figure 8 above shows the result of the comparison between the existing logo and logo that was perfectly proportioned. The existing logo on the left showed that the ratio of above and below (A

& B) of the logo was almost proportioned. However, the logo that was adjusted using Phi Matrix Golden ratio achieved a perfect proportion between above and below (A & B) of the logo.

The existing logo also showed that the area between (C &D) was not balanced as compared to the adjusted logo on the right, which was balanced.

5. Conclusion

The use of the golden ratio in logo design is intended as a measure to obtain a good proportion to increase the aesthetic value of the logo, according to the study on the application of the golden ratio on logo design, any shape, regardless of shape or size, can benefit from the use of the golden ratio. The golden ratio is expected to serve as a guide for designers seeking a proportional shape with a measurable track.

The proportioning systems and regulating lines of the golden ratio contribute to the cohesive composition of successful design, and understand the application of the golden ratio would benefit the design aesthetics.

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