International Review of Management and Marketing

ISSN: 2146-4405

available at http: www.econjournals.com

International Review of Management and Marketing, 2018, 8(2), 63-68.

An Application of Adobe Illustrator for a Two-dimensional Surface Food Packaging Design: A Pilot Data Visual Design Elements Analysis

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ABSTRACT

Undoubtedly, it has been proven that the attention given to packaging design is continuously supported by prevalent academic research, particularly in the food and beverage industry. However, there are opposing views which are in favour of the notion that packaging design presents more utilitarian benefits rather than hedonic benefits. Specifically, this paper describes findings based on a grounded theory which incorporates a quantitative method to obtain results to purposefully identify the visual design elements and the hedonic responses on a food packaging design. As a matter of fact, visual design elements identified in this paper act as the means of identification in measuring aesthetic values of a food packaging design with hedonic response as the mediating variable. Essentially, by applying the descriptive statistics as the measurement method, this paper primarily explores the extent and quality of the research instrument. Besides, this paper has utilised two-dimensional (2D) graphic technology via the application of Adobe illustrator to present a set of visual design elements. In addition, the pilot test result of the perceived visual design elements which were ascertained by the targeted respondents would be taken into consideration for further studies with respect to the design and aesthetic values of 2D graphic.

Keywords: Food Packaging, Two Dimensional, Visual Design Elements
JEL Classifications: M3, M37

1. INTRODUCTION

Generally, in examining the relationship between perceived visual design elements and hedonic values in appraising aesthetic values, it is vital to understand the objective of having a packaging design for food. In fact, there are three types of packaging in the packaging process which include primary, secondary and tertiary packaging. According to a finding, it was concluded that people make up their minds within 90 s during their first evaluation of products with regards to the design element. Interestingly, colour was discovered to significantly influence customers' mood and feelings towards a product (Li, 2016). Also, there are other findings which have reviewed on the visual design elements that have an impact on packaging design appraisal. For instance, the element of packaging design with close relation to colours might be able to reveal the degree of favourability of a particular food product. Besides, the impression, taste, texture and aroma of the food which is produced while looking at the image of the product can deliberately induce vivid imagination which would result in craving among the viewers (Orth et al., 2010).

In particular, our study focuses on the holistic visual design elements that are outlined on the surface of a primary a food packaging. Clearly, the first knowledge gap is the absence of a specific measurement in measuring visual design elements in connection with the hedonic responses. Secondly, it is noted that there is little scholastic research which observes the usage of two-dimensional (2D) computer aided design (CAD) in designing food packaging design.

1.1. Visual Perception

"Although the design of a package is one of the few point-of-sale tools available to inform and persuade consumers, little is known on how it affects consumer processing" (Orth et al., 2010).

Basically, the consumer process can be divided into two sections which are known as the central route and the peripheral route. Notably, Orth et al. (2010) have emphasised on the importance of functional package attributes that include the design elements which aim to boost the package's overall appearance, since the functional benefit is being claimed normally fall to a subjective appraisal which make it difficult to judge. When this issue occurs, consumers tent to perceived the quality of a packaging design based on the visual attributes. In an analysis by Silayoi and Speece (2007), have presented the visual design elements of a convenience food packaging design which includes elements such as colour and graphic, packaging shape, product information, packaging technology and layout of graphics information plays an important role towards the packaging design itself. Henceforth, in understanding both values of hedonic and utilitarian, it is essential to continuously enhance consumers' perception in delivering both values. Subject such as product volume and value for money has always possible to rely on the shape and size of the packaging, which it delivers the utilitarian benefit for the consumers. It is how aesthetic would cater the hedonic perspective? A key study by Hirschman and Holbrook (1982) have found out that hedonic perspective is essential to upkeep and further enhance the marketing research on consumer behavior (Mathews et al., 2009). In Malaysia, the Food Act 1983 and the rules and regulations of food 1985 are to monitor the consumers' rights in terms of health and other issues pertaining to preparing, producing and the use of the food products. Hence, there are specific elements that need to be appeared on a food label such as brand and logo of the company, text, name of the product, ingredients, nutritional facts, net weight, information of the food producer, expiry date, barcode, HALAL Logo, "Made in Malaysia" logo, tagline, illustration and photography of the food, colours, preparation instructions, price, environment information, caution sign/logo and other related symbols (Mokhtar, 2014. p. 67).

As a matter of fact, the theoretical framework of this study takes into account the effects of packaging design from the higher-order generic design factors which is then composed into multiple elements. Specifically, this theoretical underpinning is closely related to the Gestalt principles which opines the whole as a comprehensive sum of design.

Later, this process can then be alienated into two distinctive routes which are (1) the quality route and (2) the attractiveness route.

1.2. Theory of Gestalt Principles

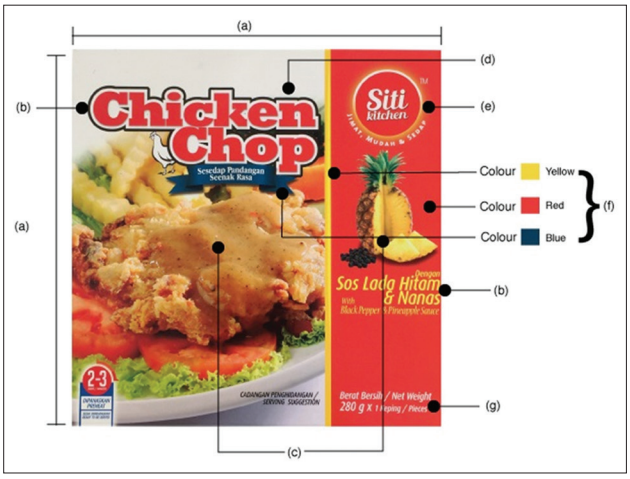
Precisely, our study closely followed the Gestalt theory by focusing on the holistic visual design elements that are imprinted on the surface of a primary food packaging. Actually, the word "Gestalten" originated from an image's description and the perceived meanings of the viewers (Guberman, 2015). According to Lugo et al. (2015), the classical Gestalt principles were proximity, continuity, closure, symmetry, parallelism, similarity, and common fate. Inevitably, these elements enable humans to perceive the "whole form." Additionally, with close relation to the Gestalt principles, this study presents 2D representations of visual design elements which consist a flat surface of a selected packaging design as the design stimuli. This particular 2D stimuli as shown in Figure 1. All these listed visual elements are used to measure the Gestalt principles in this study. Substantially, the subject of visual perception in accordance with the Gestalt "grouping" principles has been applied in neuroscience and computer vision. The definition of packaging design which is acquired from a collection of thoughts by Bloch (1995) and Gestalt psychologists, Koffka (1922) and Wertheimer (1925) has actualised the meaning of holistic design by applying various elements in achieving a particular sensory effect (Orth and Malkewitz, 2008). In this study, these design elements are shown to be associative on a 2D surface packaging design in Figure 1.

As observed in Figure 1, the imperative design of a ready-to-eat meal packaging design is strictly adhered. For instance, the visual design elements present in Figure 1 are (a) the square shape, (b) the bold colours of typography, (c) food illustration, (d) statement of identity that presents the essence of the product, (e) the brand name, (f) combination of a variety of colours to enhance the packaging design and lastly, the (g) net quantity. Significantly, these elements are among other elements that should be made available on a food packaging design to be conveyed to the consumers.

2. UTILITARIAN VERSUS HEDONIC BASED ON THE GROUNDED THEORY OF INDIVIDUAL DIFFERENCES

Furthermore, in supporting the review by Hirschman and Holbrook (1982), it is fundamental to acknowledge the value of hedonism which can be enhanced through visual cues on a packaging design. On the other hand, the utility element has always been the top priority which influences consumer choice. However, it is irrefutable that value of hedonism with regards to the visual representation is impactful in situations which involve products that rely on the first impression of the viewers. Thus, this paper presents the result of descriptive statistics on the reliability of perceived visual design elements that have been appraised by students of art and design. As a matter of fact, both utilitarian and hedonic responses have been studied to ascertain the quality

Figure 1: Phase ii: Surface design of the small medium enterprise food product of Malaysia, a two-dimensional representation on Adobe illustrator



and attractiveness of a product. In addition, these qualities have also been interpreted as central and peripheral routes. Particularly, central route has always been identified as the quality route, while peripheral route is considered as the source of attraction of a particular product (Orth et al., 2010). Although there have been numerous studies with respect to the outcome of these two routes, it is important to employ routes that might positively contribute in the design development of a packaging design. In the context of food packaging, several key visuals must be emphasised.

3. STIMULI

3.1. Proposal

In this study, visual design elements were identified using CAD (computer aided tools) of a 2D graphic software or better known as Adobe illustrator. Since the objective of this study is to determine and analyse the aspect of surface design of a packaging design, Adobe illustrator was discovered to be most appropriate and it is sufficient for the purpose of viewing the design elements. Despite recent sensationalisation of three-dimensional (3D) packaging design in the design industry, this paper ultimately highlights the importance of 2D presentations of a packaging design (Table 1).

With regards to the presentation of visual design elements for the stimuli, a ready - to - eat meal food packaging was selected for evaluation purposes. Most importantly, the evaluation underlines the significance of surface design that complements the objective of the study which scrutinizes the front of the packaging design. Accordingly, a picture of the packaging was captured and edited with Adobe Photoshop and Illustrator to enhance visual presentation. Next, the entire procedure of identification of visual design elements was supervised by a senior graphic designer specialising in SME packaging design in one of Malaysia's SME organisations. Then, the expertise within the subject was taken into account during the evaluation.

Moreover, this paper serves to accentuate the essence of a 2D surface design of a food packaging. This is because the front package itself has the ability to capture one's attention towards the final evaluation, be it quality or attractiveness wise. Thus, this paper proposes the implementation of Adobe Illustrator towards achieving the desired visual representation. Besides, a previous study by Yangjing et al. (2015) reiterated on the significance of digital technology which closely revolves around the process of packaging design. In this context, the cultivation of knowledge related to the process of packaging design would further assist designers in image and text data handling which improve the designers' adeptness in producing quality design. To add on, the arrangement of visual design elements are also chose by professional designers. Unfortunately, the visual assistance provided to the food producers is only limited to a certain extent, thus creating a boundary between designers and SME food producers. In particular, this setback affects the process of selecting and understanding packaging design in designing desired responses (Orth and Malkewitz, 2008). Evidently, Adobe illustrator is still being used in the process of designing a packaging (Figures 2 and 3).

Table 1: General design software requirements information obtained in this study

Software	Usage in packaging design
Adobe Illustrator	Illustration, designing
Adobe Photoshop	Image editing
3D max, AutoCAD	Perspective, Modelling

3D: Three-dimensional

In this study, the stimuli of this paper is presented with respect to the visual design elements and the Gestalt's principles. Specifically, the two phases of stimuli in this paper are as follows: (1) Identification of visual design elements on a selected packaging design and (2) 2D representations of visual design elements using Adobe illustrator.

3.2. The Application of Adobe illustrator

In this fourth era of industrial revolution, holistic research, design and production approach are considered as crucial components. In fact, these approaches should fit within the context of smart manufacturing which stresses that subjects are interconnected with each other in terms of research, design, testing, production and quality control (Vanderroost et al., 2017).

Figure 2: Conceptual and ideation process using two-dimensional sketch by emphasising the front package

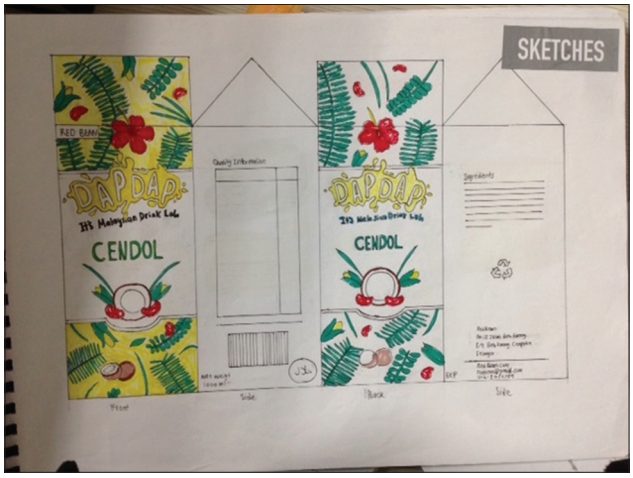
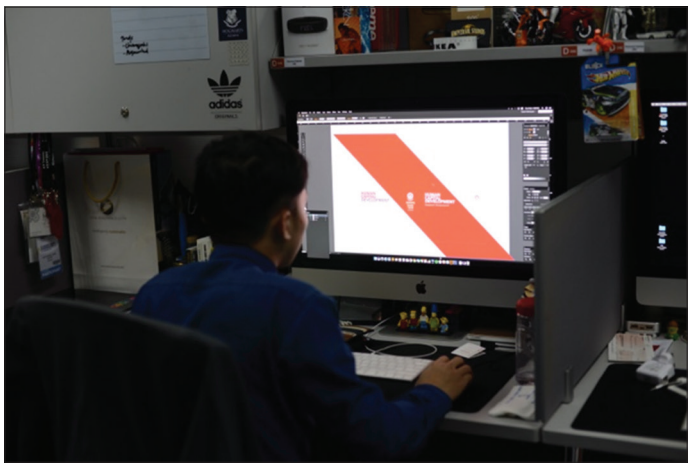


Figure 3: The usage of Adobe Illustrator in packaging design



3.3. The Characteristics and Application of Illustrator

Moreover, the recent design software; Adobe illustrator is equipped with characteristics such as perspective drawing, beautiful strokes, bristle brush, multiple artboard enhancements, shape builder tool, drawing enhancements, round - trip editing with Adobe Catalyst CS5, resolution - independent effects, clean, sharp graphics for web and mobile devices and integration with Adobe CS review (Adobe Press, 2010. p. 8). According to Zhu (2014), Illustrator is a CAD Software that is widely used in product packaging design, graphic design, advertising, illustration and other fields. Besides, the technical operation of Adobe CS is easily grasped as it is beginner-friendly and provides step-by-step tutorial for designing.

4. TARGET RESPONDENTS

Initially, this study aimed to evaluate the perceived values among people with design background to gauge the perceived level on the visual design elements and aesthetic appraisal. In order for this criterion to be fulfilled, university students which have passed their fundamental art and design subject were engaged as participants for the pilot test. Indeed, the experience and knowledge gathered during the evaluation process of design assessment has impressed a certain value among these students.

5. EVALUATION

Generally, the evaluation in the pilot test mainly involved the testing of the variables. However, in this paper, the result of the reliability analysis of the independent variable was cited. In this paper, Figure 1 shows the visual design elements that were assessed as the independent variable.

Henceforth, the reliability of the research instrument was employed in this pilot study. After the reliability of the measurement was tested, the analysis of Cronbach's Alpha-Coefficient was incorporated to assess the reliability of the measurement. According to Nunnally and Bernstein (1994), the Cronbach's Alpha must possess the value of above. 70 to be considered as a suitable item scale to be measured.

For the purpose of this paper, the visual design elements' appraisal is being measure in a statistical data. This paper was delineated using the descriptive statistics analysis which applied the Cronbach's alpha as the method of measurement and evaluation. Precisely, the reliability of the instruments has to be within the compliance of a preset standard. Thus, justifying the application of the Cronbach's alpha testing. According to Tavakol and Dennick (2011), the estimation of reliability is able to identify the error in estimation of the measurement in one particular test. With respect to this study, the purpose of Cronbach's Alpha in this paper was also to determine the items which are correlated to each other. However, it was argued that a high coefficient alpha does not necessarily lead to a high degree of internal consistency. In fact, the ulterior motive of determining the internal consistency of the measuring items using Cronbach's Alpha is to analyse the "interrelatedness" of the sample test items. Consequently, these alpha values would provide further insight and shape the development of assessments and questionnaires.

Table 2 presents summary results of internal consistency with regards to the items measurements of visual design in the pilot study.

For reference, the visual design elements that were assessed are shown in Figure 1. As mentioned previously, the assessment was conducted with adherence to the Gestalt's principles in order to comprehensively represent the holistic views of the packaging design.

6. FINDINGS AND CONCLUSION

On top of that, the findings of this paper are aim to strategically highlight beneficial properties for packaging designer which would provide breakthroughs for future marketers and SME food producers in Malaysia to better understand the usage of 2D graphic representations for the food products.

Also, it should be noted that the first knowledge gap evident in this paper is there is no specific form of measurement to calculate visual design elements and its aesthetic values.

In response to the first knowledge gap of this paper, the visual design elements which are presented in Figure 1 were firstly assessed by the targeted respondents and it was concluded that the reliability of the visual elements are acceptable and reliable for further study.

Secondly, another evident concern is the issue of insufficient scholastic research which observes the usage of 2D CAD in designing food packaging design. In contrast, news regarding 3D approach is gaining momentum and has begun to monopolize the designing industry. Nevertheless, the 2D structure remains integral especially in presenting the visual design elements as an overview. For instance, Berghman and Hekkert (2017) mentioned that aesthetic considerations are not supposed to be appraised alongside products that are deemed artistic as monotonous items may also project similar aesthetic values. To exemplify, the common objects that are considered monotonous are toothbrushes and food packaging.

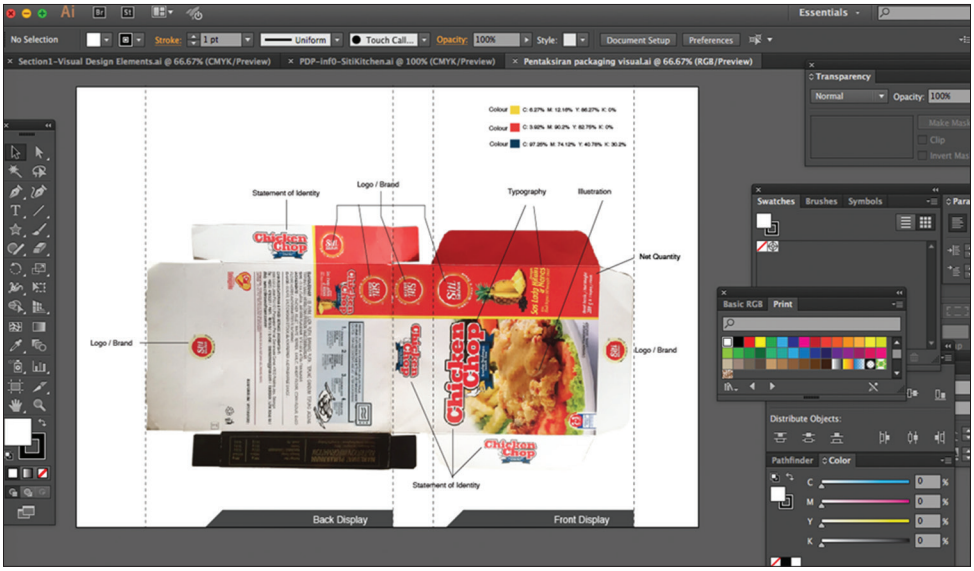
Concisely, this paper was designed to determine the values of the application of computer - aided technology such as Adobe illustrator for packaging design that have the possibilities in assisting both designers and food producers and marketers. Indeed, there is still a need for the design industry to continuously keep abreast with updated versions and features that will potentially ease designers, thus facilitating food producers to revolutionise design within the needs of a particular food product (Figure 4).

Table 2: Summary results

Variable	Cronbach's alpha	Number of items
Visual design elements	0.857	7
Hedonic value	0.915	12
CVPA	0.924	11
Product aesthetics evaluation	0.936	15

CVPA: Centrality of visual product aesthetics

Figure 4: The usage of Adobe Illustrator in packaging design: Phase (1) identification of visual design elements on a selected packaging design



7. CONCLUSION

In the correlation between visual design elements and the existence of Gestalt's theory is transparent and applicable with the 2D application in food packaging design. Although this paper did not specify or provide any verification regarding the acceptance and utilization of the 2D application among the majority of stakeholders of food marketing, this approach can be examined in future studies. Nonetheless, this paper has provided several noteworthy contributions for the food marketers to fully comprehend the perspective of food packaging in a 2D computer application and the visual design elements that represent the aesthetic values. As such the visual design elements present in Figure 1 are the most essential elements that would grab the consumer's attention towards a food packaging design. Additionally, further enhance the marketing research on consumer behavior.

Therefore, as the purpose of this paper is to serve the needs of food producers and marketers, specifically to understand the basic application which can be implemented for future food product packaging and its' design that will serve the aim in creating attention among consumers. In addition, with the comprehension of this CAD, it is hope that it will cater the need of food producers and marketers understand better the significant value that can be offered by packaging design. Since through the phase of data collection and past reviews found that there is a gap of knowledge among food producers and marketers in understanding the importance of packaging design for food products, especially for SME products which falls under the category of micro enterprises.

In addition, this paper provides a data analysis obtained from a pilot study studying on the visual design elements that offer significant values on a food packaging design. A reliable value on listed visual design elements such as are (a) the square shape, (b) the bold colours of typography, (c) food illustration, (d) statement of identity that presents the essence of the product, (e) the brand name, (f) combination of a variety of colours to enhance the packaging design and lastly, the (g) net quantity are in line with previous studies presented in this paper which looked on the quality reasons. However, the findings of this paper contributed to the hedonic perspectives and its' perceived visual design elements that contribute to an added value of aesthetic appraisal on food packaging design. Henceforth, this paper presents the concept of evaluating the 2D food packaging design by undergoing appraisal by people with design background as the individual differences values highlighted will be valuable for food marketers especially. Ultimately, this study emphasises on the significance of aesthetic appraisal and the visual design elements present through the application of a 2D design for the enhancement of design practice for both designers and non-designers.

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