

# ATTRACTIVENESS' FACTOR IN FOOD BASED LOGO DESIGN

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## ABSTRACT

This research aims to understand the factors of 'attractiveness' food-based in logo design. Based on an in-depth literature review, the research includes one design dimension, 'attractiveness.' "Attractiveness" is investigated on its influences on emotive consumer response. To reach the understanding of 'attractiveness,' one of the methods used is the Viewer's Impression Words (V.I.W.), a modification of Kansei Words (K.W.) usually found in Kansei Engineering. This method combines formalistic and visual semiotic analysis theory to achieve the Viewer's Impression Words (V.I.W.). Emotion Engineering presents a combination of quantitative and qualitative methodologies and is used to achieve loose principles to help designers understand the factors of an 'attractive' logo. This method is suggested as a new technique to improve the process of Emotion Engineering through understanding the factors of attractiveness in logo design and thus offer loose principles to help in 'problem-solving usually found in graphic design. 50 logos was selected as a design stimuli. These logos were then classified according to their domain which is food companies. Results showed that attractiveness is an important part of a food-based logo design from the suggested method. From the V.I.W, selected words suggested by participants (consumer), it can be transformed into loose principles to help new designers to design based on consumers' preferences. The findings also suggest that it may help designers reach 'attractiveness' in their logo by getting the idea of what is preferred in food logo design.

**Keywords:** Logo design, attractiveness, emotion engineering.

## INTRODUCTION

This paper aims to investigate how food-based logo design characteristics influence consumer response. Based on the literature review in the food-based company logo design domain, the research included a fundamental principle, which is 'attractiveness.' This principle was based on in-depth literature

reviews that look into the term, similar to the principle of ‘appeal’ found in the 12 principles of animation. The term is also found in the art and design principle, although with slightly different meanings and how the word is used. The research aims to understand the attractiveness factors that affectively influence consumers in their decision-making. Attractiveness is ambiguous and subjective. It carries different meanings to individuals due to its subjective nature. Therefore, the methodology brought in this study looks at ‘User-Centered Design,’ which attempts to understand ‘emotions’ with a combination of qualitative and quantitative methods.

## **PROBLEM STATEMENT**

Attractiveness in logo design.

1. Hard to define ‘attractiveness.’

Logo design choices might look unimportant to some people (Luffarelli et al., 2019). Some do not put much effort into finding the right design to represent their establishment. It is partly because the literature on attractiveness has not been published widely. In the design field, ‘attractiveness’ is often misinterpreted and is a perplexing principle to be defined. It can be associated with the principles of ‘appeal’ that are usually found in animation and graphic design principles. Attractiveness has also been regarded as a personal likeness and a subjective perspective (Williams, 2002). A design without appeal is rather monotonous and less exciting (Walker, 2013).

2. There is no known method to achieve attractiveness

Past studies readings show that methods that focus on achieving ‘attractiveness’ in logo design are rare. There seems to be a lack of literature and comprehensive information; no effective formula has been devised to achieve the outcome (Iuri, 2009), (Walker, 2013) and (Yuen et al., 2015). To achieve the ‘attractiveness’ of a logo design, the designer will use his own experience, education and skills in designing a logo.

3. Student designers design according to their gut feeling

Defining ‘attractiveness’ in a logo usually gives designers differing points of view; thus, it shows subjective understanding. Many will come up with emotive suggestions such as feelings, psychology, and semiotics in the elements of

their logo. For example, choosing a suitable color for a brand involves more than cosmetics. Designers will investigate color-coding systems such as RGB, CMYK, and spot colors when selecting colors. These systems will help designers choose their colors to make designs look good or attractive. For instance, RGB is suitable for the screen, but selecting a CMYK color may hamper the design. It is easier for experience designers to pinpoint these systems through experience but may not be so for students and new designers.

## **RESEARCH OBJECTIVES**

This research aims to achieve three objectives. The first objective is to propose a method to measure ‘attractiveness’ factors embedded in successful logo designs using the ‘emotion engineering’ approach. This approach is a combination of the art and design field with science. The second objective is to investigate the structure of an attractive logo design, the significant factors, the usage of design principles, perceptions, design theory, and its influence on the viewer’s impressions. The third objective is to provide evidence that emotion engineering can capture and quantify viewers’ impression of attractiveness from existing successful logo designs through empirical studies.

## **HYPOTHESIS**

The specific ‘attractiveness’ factors can be the significant driving influence that makes logo design successful and incorporate the emotion engineering method through the viewer’s impression in determining the attractiveness factors. Students and designers can adopt emotion engineering to find logo design attractiveness factors by assessing viewers’ impressions. Lastly, students can formulate the research data as new loose principles (to assist designers).

## **SIGNIFICANCE OF THE STUDY**

Based on the research objectives, firstly, the study can achieve a method to measure ‘attractiveness’ through viewers’ impressions of existing successful logo designs. Secondly, the study will identify the structure of attractive logo design, the significant factors, the use of design principles, and its influence on consumers’ impressions. Also, it will produce novel logo design ‘attractiveness’ principles by extracting ‘attractiveness’ factors embedded in existing successful logo designs. Thirdly, through emotion engineering, the study can produce a noble method to design logos that could understand the attractiveness factors through consumer impression.

## **RESEARCH SCOPE AND LIMITATIONS**

Limited literature exists on logo design K.E (emotion). As such, citations are mainly based on Interface design (Lokman, 2010, Kim et al., 2003). The research also focused on audience impressions of successful logo design only. The study limits itself to investigating 'attractiveness' embedded in the selected good logo design domain through viewers' impressions. The study will separate the chosen logo designs into specific parts (10 design elements) from the (anatomy of a logo) to enable evaluations through design and gestalt theory principles.

The subjects for the F.V.S.A. analysis consist of designers and academicians chosen from around Sabah. Subjects employed were selected from a specific group of Universiti Malaysia Sabah students from the researcher's faculty. The number of participants is 50, assigned to undergo the semantic differential scale exercise. The Viewer's Impression Words (V.I.W.) or modified Kansei Words (K.W.) is limited to 30 words only that were selected from thousands of potential words. The experimental phase was devised to validate the proposed loose attractiveness principles., which might not reflect actual practice.

## **LITERATURE REVIEWS**

Logo design choices sometimes looked unimportant to some. However, getting the design on point is vital for several reasons. According to Luffarelli et al. (2019), a well-designed logo will significantly benefit establishments. A well-designed logo will help boost the interest of customers, distinguish brands from their competitors, help to facilitate brand recognition, convey information about the brand, and influence investors' decisions. It is also a communication tool that establishments use and appear in the company's products, websites, business cards, etc. It is an element that consumers will always see.

The design characteristics of logo design can substantially affect consumer behavior and brand performance. Previous literature has shown that a logo's complexity and simplicity can influence investors' decisions and that the logo's symmetry or asymmetry can boost brand identity. Looking into a study by Machado (2015), The paper aims to study how logo design characteristics influence consumer response. Based on an in-depth literature review on consumer responses to logo design, the authors included one fundamental dimension of logo design in this research: naturalness. They investigated the influence of the different types of natural logo designs on affective response. Some literature touches on theoretical aspects such as the design process and

design but rarely touches on understanding attractiveness and measuring them. Design attractiveness has been discussed, but no details on achieving appeal (Walker, 2013; Carter, 2016; Iuri, 2009; Yuen et al., 2015; Mohd Yusof, 2014 and Tsukamoto, 2006). The principles of logo design suggest typically showed how to design using principles such as keeping the design simple, using color strategically, making it scalable and versatile, looking great in black and white, making the design memorable and timeless design (*6 Basic Principles of Logo Design*, 2018). An example of a principle that focuses on attractiveness is ‘appeal.’ It is an essential principle in animation. The principles of ‘appeal’ were initiated based on the work of leading Disney animators. The purpose was to produce the illusion of characters that follows the fundamental law of physics, timing, and character appeal (Thomas & Johnston, 1995).

### APPEAL AND ATTRACTIVENESS

Pillar principles in design and animation, always confused to mean cute and fluffy (Lassester, 1987), appeal to have your eyes drawn to the specific figure and appreciate what we see. An appeal does not appear naturally (O’Connor, 2018), and almost impossible to establish an exact definition (Walker, 2013), making it a guessing game and prone to failure. Also, it is very subjective, and opinion varies between viewers.

Designing a logo requires a comprehensive problem-solving method and a combination of different aspects and elements (Iuri, 2009). Most literature on character design focused on drawing style and technical aspects and ‘how-to’ (Vincent, 2017). User-Centered Issues (emotion engineering) were visible in the research by (Amiruddin, 2017). The study uses questionnaires to quantify viewer responses from various animation designs such as (Anime, Disney, and Malaysian animation). After, a guideline was produced to assist designers. These efforts were supported by (Mohd Yusof, 2014) by using face-to-face interviews and visual literature incorporating a ‘character matrix’ (Tsukamoto, 2006) by dividing personality and six classifications (using a rectangular mathematical layout) consistent with Gestalt Theory. Lack of extensive understanding of the process led to an effort called ‘the process of character design (Iuri, 2009), describing the methodology and creative aspects of the process. However, it only touches on the planning and organizing model.

## **FORMALISTIC AND VISUAL SEMIOTICS**

Formalistic and Visual Semiotics is a study of signs, which can be anywhere and everywhere. Signs mean visual signs that include designs, paintings, and photographs (Chandler, 2007). Visual semiotics provides an intuitive approach to creating designs (Mohd Yusof, 2014). Mamaghani, Dalir, and Soleimani (2014) use the semiotic approach in watch design, where it is used to identify the feelings and emotions of the customer. Data was achieved from the representation according to identifiable aesthetics, criteria, and cultural factors.

## **EMOTION ENGINEERING**

They were also known as Kansei Engineering. Almagro and Martorell (2012) mentioned that Kansei Engineering incorporates emotion in design and product services. It also realizes how the properties of a product or service carry certain emotions in its users. In the K.E method, the engineers get data by using specially devised questionnaires. Model in K.E shows three main steps, which are (I) defining the elicited emotions (semantic space); (ii) decisions on factors that affect response (space of properties) (iii) model of each factor in relation to each response (synthesis phase). This experiment mimics experiments done in an industrial context. However, Kansei Engineers are not statisticians. The statistical techniques practiced in K.E. can be misused, and K.E. could also benefit from extensively used statistical methods. K.E. does not focus on advancing statistics; instead, it proved a good platform for statistics techniques in other areas. Nagamachi (2010c), in his book, stated that to use K.E methods, the Kansei engineer would need to observe customers' or viewers' behavior to determine their feelings, wants, needs, and emotions. In the next step, the knowledge of statistical methods should be in the engineer's hands to enable them to achieve good specifications of new product design. It is also essential for the engineer to learn human factors or ergonomics discipline to facilitate ease of use for customers to operate.

Over the years, Kansei Engineering has developed to be one of the design philosophies used in the modern design of vehicles, furniture, and FMCG products. Kansei Engineering's main concern was the user-centered issue that significantly values academic and industrial value. According to C.C. Chen (2018), Kansei Engineering is user-oriented, and it concerns the user's personal needs and desires. Kansei Engineering provides a systematic method to transform the user's affective and emotional responses into design and engineering specifications. The technique emphasizes integrating analytical and

practical approaches to assist in problem-solving. Kansei Engineering Method has been used and proven to be successful in many different areas. The experts in this research field also had been working to encourage interdisciplinary interactions and cooperation.

## Methodology

The research methodology uses a mix-method style, where it combines qualitative and quantitative methods. The researcher explores Kansei Engineering methodology to find potential paths to understand ‘attractiveness’ in logo design. The procedure provides a systematic platform for reaching the aim of this research. A few types of Kansei Engineering methods exist; however, Kansei Engineering Type I was the closest to this research, theoretically and technically. The graph below explains the research framework.

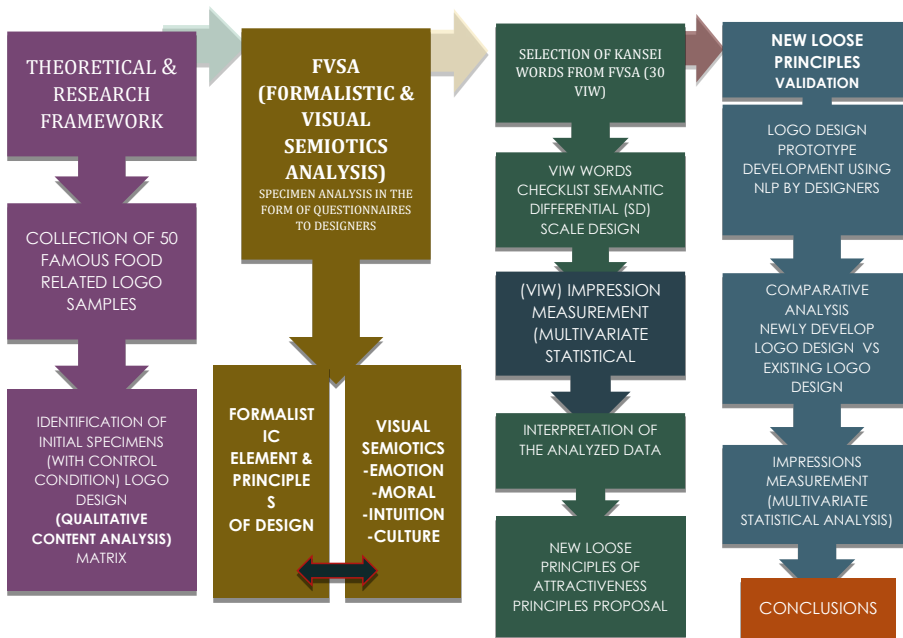
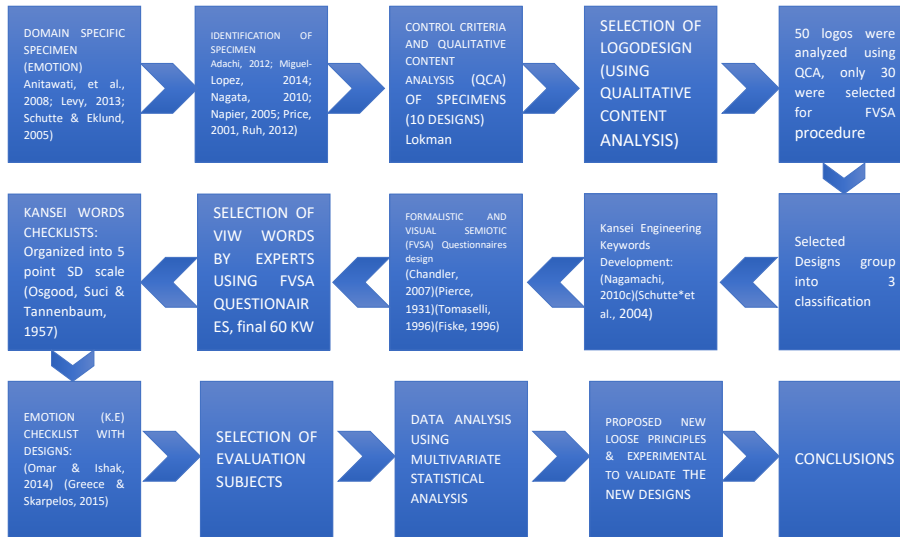


Figure 1 The research process



**Figure 2** The research process (Con't)

### **ANALYSIS OF GOOD LOGO (FORMALISM APPROACH)**




The research also uses a partly formalism and semiotics approach in analyzing food-related good logo design. There are too many choices available; hence, the study only chose 50 famous logo designs from the internet and ran the analysis. There were four steps of formal analysis in logo design: description, analysis, interpretation, and evaluation (Bank, n.d.). In writing a formal logo design analysis, it is essential to clarify the formal elements of work (logo) that affect the depiction of the subject matter and its expressive content. The formal information and element are the ones to emphasize. It is important not to interpret the artwork. Formal analysis is a technique that is important and is used to organize visual information. It can also be understood as something that is used to interpret things seen in an artwork into written words. This method can be applied to photographs, paintings, designs, or any work of art from any period. A formal analysis paper can be used to analyze famous logo design to understand why it is successful and famous. It is a simple analysis of the elements such as shape, forms, color, mass, space, and line used in the design. In this study, formal analysis is transformed into F.V.S.A. or Formalistic and Visual Semiotic Analysis. It is a questionnaire developed from past studies for extracting V.I.W. or Viewer's Impression Words. Viewer's Impression word is a modification of Kansei Words contained in the Kansei Engineering method.



**Table 1** Questions example of formal analysis (Bank n.d)

Description	Analysis
What kinds of things do you see in the work? How would you describe them? What information can you get from the logo? Abstract/ Realistic	What element of art did the design use (Line, Shape, Space, form, texture, color)? What Principles of Design are used (rhythm, movement, balance, proportion, variety, emphasis, and unity)? How do the elements and principles of design work together?
Interpretation	Judgment
What do you think this design is about? How does the design make you feel Would you agree with the choice of medium and colors	Why do you think people should accept this design What would you do if you were the designer? What is worth remembering about the design

**Table 2** Information on the selected food logo design (example)

	Logo:	Basic Info	Formalistic Traits
1		The symbol shows a stylized coffee mug, which now uses only a wordmark consisting of the brand name only within orange and pink. Color brings joy and a happy mood	Round shapes, use of color, lines, background, and foreground
2		The logo symbolizes the arches, which is the substance of the architecture of the franchise. The shape of M. Simple	Shape and color, use of foreground and background, lines
3		The color indicates stimulation and appetite, happiness, and friendliness.	Round shapes, foreground, and background, color use, lines,

The F.V.S.A. is a method of combination of formalistic analysis and visual semiotics. The matrix score below (Table 3) is used to select the Famous logo from the food domain to select the 50 good logos based on their F.V.S.A. appearance. These are also used for calculations later in the Kansei Engineering approach in reaching loose principles.

**Table 3** Matrix score for selection of food logo design (example)

Logo Design

	Appearance	Simplicity	Memorable	Flexible	Color/Appropriate	Timeless	Unique	Quali Typo	Meaningful	Vectorized	Proportion	Score
Dunkin Donuts	/	/	/	/	/	/	/	/	/	/	/	8
Mcdonalds	/	/	/	/	/	/	/	/	/	/	/	9
Burger King	/	/	/	/	/	/	/	/	/	/	/	9
Subway	/	/	/	/	/	/	/	/	/	/	/	7

### LOGO DESIGN SELECTION THROUGH QUALITATIVE CONTENT ANALYSIS (Q.C.A.)

Further investigation of the chosen logo design uses the Qualitative Content Analysis approach through Mayring’s Step Model of Inductive Category Development. To select suitable logo designs from the Chosen 50 famous logo designs, the research uses this step. This data is then combined in the F.V.S.A. analysis. The object of qualitative content analysis can be all sorts of recorded communications such as videotapes, documents, and protocol of observation. Qualitative content analysis is defined in the framework as a practical, methodological, managed analysis of texts within their context of communication, following content analytical rules and step-by-step models and with less quantification (Becker & Libmann, 1973). The approach used in this section is to investigate each element of good design in logos. The quantitative method in this section of research is not emphasized.

The item/categories needed for the analysis to identify good logo design characteristics were listed down. The design item and categories can be observed through the logo anatomy, such as originality, ideas, letterforms, iconography, eligibility, and details (Leonardis, 2015). The selection of the logo elements also followed the approach of Hiroyoshi Tsukamoto’s personality matrix and costume matrix, which uses classifications (Tsukamoto, 2006). The categories were also based on secondary data available from magazines and websites on logo design. The list of items/categories in this part of the research followed the Kansei/ Affective Engineering Type I (Nagamachi, 2010c). The item/ category or design elements of the logo design are related to the final design specification: Category in this research means the detail of the design item — for instance, the elements of the logo such as appearance, memorable, etc. The selection of the product’s item and category should be thoroughly checked as a refined classification of the item and categories will lead to a successful design.

The research organizes the pre-selected logo design into sections by using the Gestalt approach.

**Table 4** Qualitative Content Analysis (Q.C.A.) on logo design elements

	<b>Design Elements</b>	<b>Item/ Category</b>	<b>Definition</b>	<b>Coding Rule</b>
1	Appearance	Personality Balance	Should reflect your business - personality	The logo must appear strong or balance
2	Simplicity	Simple Ease	Easily recognized, simple, when printed on its own, it is distinguishable	Looks simple, easy to apprehend
3	Memorable	Discovery Less Abstraction	Can communicate without the company name. Not too noticeable. But not too ambiguous until the message is lost.	The logo should appear memorable, with the potential for discovery and less abstraction.
4	Flexible	Visible Distinguishable	It should be visible from far. Also should be distinguished in size.	The logo must appear visible from any angle and is distinguishable

Source:(Soikun & Ibrahim, 2018)

**Table 5** Elements of a good logo

	Elements of Logo Design	Item /Category
1	Appearance	Strong Balance
2	Simplicity	Simple Ease
3	Memorable	Retain/identify Less abstraction
4	Flexible	Visible Distinguishable
5	Color appropriateness	Less colour Ease of reproduction
6	Timeless	Innovative Long life
7	Unique	Stand out Assuring
8	Quality Typography	Readable Legible

9	Meaningful	Representation Ambassador
10	Vectorized	Flexibility Communication

Source: (Bowersox, 2017)

The study conducted a step-by-step analysis and sees that only certain logos are suitable for the investigation as some of the logos have a resemblance to each other. The research only uses 30 logo designs to undergo the following process and created the F.V.S.A. questionnaires to provide adjectives, nouns, etc., by referring to the elements, principles, and design theory. Using ‘purposeful’ sampling technique, the research chooses the evaluation subjects for the F.V.S.A. questionnaire. This technique is often used in qualitative research to identify and select individuals considered experts and knowledgeable in their respective fields (Cresswell & Plano Clark, 2011). The recruitment of respondents in the study involved selecting designers and academicians from design studios and the researcher’s university.

The V.I.W. are collected by investigating the ‘attractiveness’ factors embedded in successful logo design. Kansei words were collected after the Kansei Engineer understood the intended strategy, and the collection of words will be related to the product domain. The words are usually synthesized from related magazines, business newspapers, or salespeople concerning customer emotions and opinions. The Kansei words are adjectives, nouns, verbs, and sometimes sentences (Nagamachi, 2010c). The F.V.S.A. exercise selects 30 V.I.W. for the measurement tool. The study then organizes the 30 V.I.W. into a 5-point semantic differential scale (S.D.) checklist to measure the response to identify attractiveness factors. The SD scale (the Semantic Differential) is a psychological measurement scale devised by Osgood, Suci, and Tannenbaum (1957) and his colleagues. The positive and negative words were arranged on both sides of a horizontal line. For example, Beautiful-Ugly is set on both sides of a continuum. This method is used to clear the psychological language structure thoroughly. However, Kansei/Affective engineering was devised to achieve good design, so the arrangement was modified to beautiful-not beautiful.

Source: S.D. Scale questionnaires

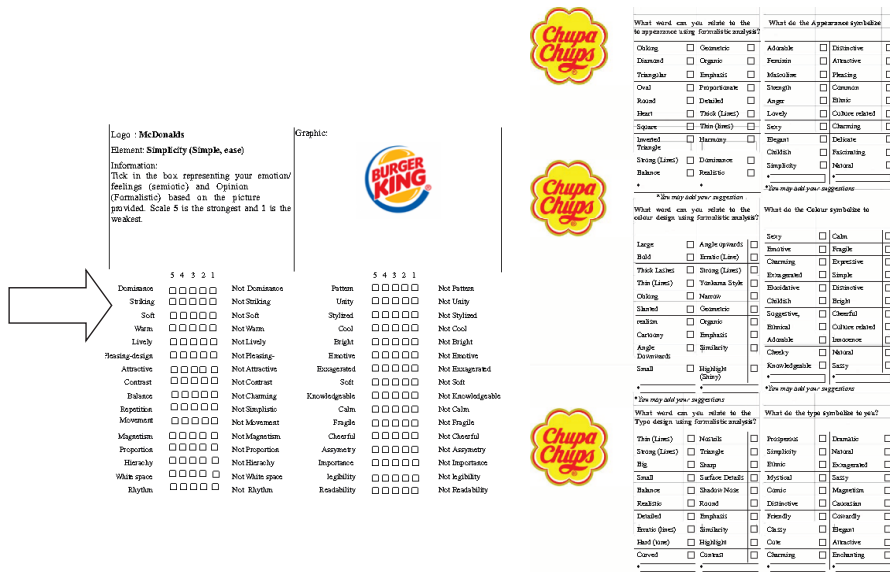


Figure 3 Example of F.V.S.A analysis to S.D. scale questionnaires

### The Concept of ‘Attractiveness’ in logo design

This research suggested that the ‘attractiveness’ concept in logo design can be made possible using Factor Analysis (F.A.). By following and referring to other Kansei Engineering research such as (Lokman, 2010a; Nagamachi, Tachikawa, Imanishi, Ishizawa, & Yano, 2008; Mamaghani, Rahimian, & Mortezaei, 2014). The ‘attractiveness’ concept discovery was from the significant factor in factor analysis (F.A.). The result of the F.A. used Varimax rotation, in which the interpretation of the variables can be simplified. Henry Felix Kaiser suggested varimax rotation in 1958.

In Table 6, Total Variance Explained, a total of 6 significant factors were derived from a total of 30 variables. Six factors scored an eigenvalue of more than 1.00, following the Kaiser stopping rule that states only the number of factors with an eigenvalue of over 1.00 should be considered in the analysis. The help of the F.V.S.A. analysis, which was performed in choosing the Viewer’s Impression Words (V.I.W.), which consisted not only adjectives but also nouns and verbs, has significantly assisted the research in choosing the suitable Viewer’s Impression Words (V.I.W.), thus providing high factors for ‘attractiveness’ in logo design elements. The first factor explains 12.403 % of the data, the second factor explains 10.977 %, while the third factor explains 8.100 %. While three

factors represent only 31.50% and many of the factor contributions, it is not seen as strong. Hence, the other three factors will be included to represent the whole data. The rest of the factors produce low cumulative percentages and are probably considered as not significant. In the sample below, only one (1) design element was shown as a sample because of the huge amount of data.

**Table 6** Total variance explained for logo design: Appearance

Total Variance Explained			
Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	7.407	12.403	12.234
2	6.578	10.977	23.321
3	4.900	8.100	31.589
4	3.200	6.323	37.879
5	2.200	4.109	42.001
6	2.232	3.802	45.880
Extraction Method: Principal Component Analysis.			

This research suggested that the attractiveness concept of logo designs is structured by six factors derived from Factor Analysis. Table 7 shows the factor loading result. It offers more or fewer factor loadings throughout the six factors, which shows that though most parts are significant, some score higher loadings, providing insights that those designs should be highlighted and is substantial (attractiveness principles). Factors are labeled in reference to principles of logo design. Table 4.7 (rotated component matrix for logo design = Appearance) shows the factor loading results after the Varimax rotation. It shows loadings throughout the six factors, which show that most variables are considered significant with 0.5 and above scores. High score loadings mean the variables play a role in making the design elements’ ‘attractive’ and can be highlighted when designing an ‘attractive’ logo. However, certain variables that score low loadings but with support in the empirical study may include.

**Table 7** Rotated component matrix for logo design: Appearance

Rotated Component Matrix						
	Component					
	1	2	3	4	5	6
Soft	-0.003	-0.010	0.610	0.195	0.068	0.016
Repetition	-0.077	0.425	-0.270	0.142	-0.082	0.143
Traditional	0.026	0.068	0.527	0.735	-0.085	0.020
Warm	0.331	-0.119	-0.117	-0.025	0.110	-0.082
Lively	-0.008	0.017	0.757	0.075	0.505	-0.038
Pleasing	0.023	0.007	0.476	0.772	-0.089	0.047
Attractive	0.042	-0.037	0.525	0.781	0.075	0.019
Unity	0.076	-0.011	0.013	0.080	0.591	0.045
Charming	0.026	0.440	-0.356	0.168	0.079	0.002
Simplistic	0.059	0.020	0.557	0.752	0.096	-0.004
Magnetism	0.026	0.040	0.194	-0.074	0.859	0.008
Oval	0.021	0.794	0.270	-0.215	-0.041	0.009
Round	-0.142	-0.099	-0.130	0.673	0.090	0.034
Dominance	-0.066	-0.078	0.702	0.112	0.480	-0.027
Balance	0.417	-0.235	-0.009	0.023	0.124	0.007
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						

In the practice of naming the factors, according to A. G. Yong & Pearce (2013), it is more of an 'art' as there are no rules for naming factors, except to give names that best represent the variables within the factors. Labeling each factor group follows the Kansei Engineering approach to select the best representative word to describe the factor group (Nagamachi, 2010a).

The large datasets from this research that consist of several variables can be reduced by only observing groups of variables. Factor Analysis assembles common variables into descriptive categories. The item from the questionnaires can be reduced to a smaller set to get an underlying concept and facilitate interpretations. Key factors are focused on avoiding trivial variables and placing variables in meaningful categories (Rummel, 1970).

### **Partial Least Squares (P.L.S.) analysis**

The relation between the Viewer’s Impressions Words (V.I.W.) evaluation and design elements were analyzed with Partial Least Squares. In P.L.S. calculation, the evaluation values on a Viewer’s Impressions Words (V.I.W.) word are assigned to (y), or dependent variables, and the design elements are assigned to (x) or independent variables with dummy variables. The qualitative variables, such as body color, is called “item.” The item variations such as white, blue, or red are called ‘categories’. Categories are expressed with dummy variables with 1/0 values (Nagamachi, Tachikawa, Imanishi, Ishizawa, & Yano, 2008).

**Table 8** Partial Least Squares calculation

1	Dependent variables (y)	30 sets of Kansei Words response	50 subjects
2	Specimen	50 Food Based Logo Designs	
3	Independent variables (x)	9 design elements	

To discover the correlation between design elements and the ‘attractiveness’ concept in logo design, Partial Least Squares (P.L.S.) is used with SAS JMP version 13. To be able to use P.L.S., three types of data were used. The first was the dependent variables, or (y), which is the response of the 30 Viewer’s Impression Words SD scale with fifty (50) subjects, the specimen, or the (food based) famous logo design, and thirdly the independent variables (x), the design elements. The design elements were then converted into dummy variables or indicators. The score for each variable vs. design element is investigated to determine the influence of the designs elements. To reach the ‘attractiveness’ concept, the research decided to adopt the Gestalt Theory. Gestalt Theory or also known as the “Law of Simplicity” or the “Law of Pragnanz” states that the basic principle of Gestalt identifies that the whole is greater than the sum of its parts. P.L.S. analysis ran into each design element individually. P.L.S. analysis shows precise coefficient score data and has enabled the research to identify the correlation between attractiveness concept and design element. Table 9 shows the examples of logo design with the ‘appearance’ element.



**Table 9** Correlation coefficient for logo design: Appearance

Categories: Appearance						
	Variables	Coefficient Score	Variables	Coefficient Score	Variables	Coefficient Score
1	Bold	0.0807	Elegant	-0.1054	Fragile	-0.0953
2	Wavy	-0.0310	Stand out	0.2060	Highlight	0.0845
3	Traditional	0.0119	Distinguised	0.0878	Innocence	-0.0412
4	Warm	0.0358	Feminine	-0.0639	Sassy	0.0063
5	Balance	0.0690	Bold	-0.0201	Sharp	-0.0463
6	Pleasing Design	0.0132	Legible	0.0703	Heroic	0.0510
7	Attractive	0.0747	Geometric	-0.0017	Cowardly	-0.0429
8	Strong	0.0745	Organic	0.0014	Voluptous	-0.0155
9	Charming	-0.0167	Emphasis	-0.0651	Baby based	0.0614
10	Simplistic	0.0068	Realism	0.0396	Mystery	-0.0358
11	Magnetism	-0.0610	Small	-0.0420	Surface Details	0.1898
12	Oval	-0.0354	Natural	0.0688	Combative	-0.1097
13	Round	0.0827	Erratic Lines	-0.0408	Muscular	-0.0029
14	Elegant	0.1332	Flexibility	0.0519	ComicGoofy	-0.1164
15	Simple	0.0297	Pleasing-Design	0.0774	Readable	0.0603
16	Attractive	0.0894	Emotive	0.0126	Oversized	0.0126
17	Sharp	0.1374	Exxagerated	0.0102	Smooth Texture	0.0252
18	Soft	-0.1118	Soft	-0.1091	Cute	0.0093
19	Natural	-0.0647	Knowlegdeable	-0.0115	Powerful	-0.0458
20	Childish	0.0269	Calm	-0.0441	Dramatic	-0.1086

The P.L.S. table indicates that the most significant positive scores show attractive Kansei and should be selected to create the ‘attractiveness’ principles and avoid the negative score. Table 10 provides insights on arranging the variables to enable designers to refer to the provided sample and the V.I.W to design their logo. The P.L.S. analysis identifies ‘attractiveness’ by showing V.I.W with a high score. These analyses are helpful to facilitate the interpretations in this research.

### Proposing logo design attractiveness loose principles

This study has allowed efforts to develop logo design ‘attractiveness’ principles. However, the principles suggested are domain-specific as the impression is different, and some only point to a specific product. Kansei Engineering approach recommends focusing on a particular domain when executing the Kansei survey as different traits will generate ambiguity in the analysis (Nagamachi & Lokman, 2010). The analysis from F.A. and P.L.S. had enabled the research to devise a requirement to design attractive logo design traits. The logo design traits used in the principles had a strong ‘attractiveness’ influence. It requires designers to select factors that suggest Kansei that influence them to design an attractive logo. The design requirements that were included in the proposed principles were from the design elements that have the most substantial influence in

evoking the target logo design ‘attractiveness’. Table 10 shows a sample of the design elements with a good logo reference for easy access for the designers to refer to while designing and mindful of the viewer’s impression words and factors that provide ‘attractiveness’ insights.

Categories: Appearance					
Variables	Coefficient Score	Variables	Coefficient Score	Variables	Coefficient Score
1 Bold	0.0807	Elegant	-0.1054	Fragile	-0.0953
2 Wavy	-0.0310	Stand out	0.2060	Highlight	0.0845
3 Traditional	0.0119	Distiguised	0.0878	Innocence	-0.0412
4 Warm	0.0358	Feminine	-0.0639	Sassy	0.0063
5 Balance	0.0690	Bold	-0.0201	Sharp	-0.0463
6 Pleasing Design	0.0132	Legible	0.0703	Heroic	0.0510
7 Attractive	0.0747	Geometric	-0.0017	Cowardly	-0.0429
8 Strong	0.0745	Organic	0.0014	Voluptous	-0.0155
9 Charming	-0.0167	Emphasis	-0.0651	Baby based	0.0614
10 Simplistic	0.0068	Realism	0.0396	Mystery	-0.0358
11 Magnetism	-0.0610	Small	-0.0420	Surface Details	0.1898
12 Oval	-0.0354	Natural	0.0688	Combative	-0.1097
13 Round	0.0827	Erratic Lines	-0.0408	Muscular	-0.0029
14 Elegant	0.1332	Flexibility	0.0519	Comic/Goofy	-0.1164
15 Simple	0.0297	Pleasing Design	0.0774	Readable	0.0603
16 Attractive	0.0894	Emotive	0.0126	Oversized	0.0126
17 Sharp	0.1374	Exaggerated	0.0102	Smooth Texture	0.0252
18 Soft	-0.1118	Soft	-0.1091	Cute	0.0093
19 Natural	-0.0647	Knowledgeable	-0.0115	Powerful	-0.0458
20 Childish	0.0269	Calm	-0.0441	Dramatic	-0.1086

Atractiveness Factor	Burger King Logo			
	Appearance	Simplicity	Unique	Vectorized
	Bold	Elegant	Sharp	Flexibility
	Balance	Charming	Stand out	Pleasing Design
	Smooth	Simple	Distinquised	Communication
	Texture	Attractive	Legible	Readable
	Strong	Distinctive	Natural	Highlight

**Table 10** Sample of design element with logo design

To use the logo design loose principles effectively, designers should select the best combination from a concept of ‘attractiveness’ or factors that may consist of one or more elements of ‘attractiveness.’ An example of how to use the ‘loose principles’ should be as follows; for example, the designers want to design a logo, following the ‘attractiveness’ factor: appearance, designers may choose bold, balance, smooth, texture, and strong V.I.W. in their designs. To see the examples of the V.I.W., designers can refer to the attached logo designs.

Designers can also combine the ‘attractiveness’ factors according to their interpretations, either by selecting from only one factor or a combination of all factors. The factor elements can be chosen to define how to add ‘attractiveness’ to draw the new logo design; however, designers can reduce the number of factor elements to ease out the designing process. Such as choosing only a few factors or variables (Viewers’ Impression Words) that may provide understanding. Although the method can give a hint, it is only meant as a suggestion. As ‘attractiveness’ is subjective, its theory claims that aesthetic value is a matter of the psychological effect on the observer’s attitude, and these vary from observer to observer (Edwards, 1989). ‘Attractiveness’ appears as intuitive. Hence, it depends on the creativity and judgment of the designer with the help of the proposed ‘attractiveness’ loose principles. It also recommends designers blend in with their creativity and experience. This statement is supported by (Nagamachi 2010c). According to him, the essential step in Kansei

Engineering in collaboration with designers depending on the project. After the data is acquired, The Kansei engineer should collaborate with the designer and explain the analyzed data and interpretation to the designer. Several ideas might be derived from the data analysis. Hence designers and engineers should comprehend the final data interpretations and blend them with creative ideas.

## **FINDINGS**

The method and experimental study were executed, and the results were positive and managed to answer all of the objectives. Objective 1: achieved the method of measuring appealing factors by combining several arts theories such as Q.C.A. analysis, Formalistic, and Visual Semiotics analysis in Kansei Affective Engineering. Understanding the attractiveness factors in existing logos design enabled creating a new loose principle to create a new logos using the selected V.I.W. Objective 2: it can be seen that attractiveness, usage of principles, and design theory in the creation of logo design influence the viewer's impression. To have a more attractive logo design, a designer needs to understand the attractiveness factors, together with the principle of design and design knowledge. Hence, it leads to a more successful logo design in experimental research. Objective 3: it can be established that emotion engineering methods can capture and, at the same time, quantify viewers' impressions. The domain area, the famous logo design, produced loose attractiveness principles through the quantification of Kansei Words (V.I.W.) obtained from experts' opinions and viewers' impressions.

## **RESEARCH IMPLICATIONS**

Emotion Engineering can be added to design education to understand users' explicit and implicit views on art and design, especially non-tangible products such as graphic design, animation, and videos. The method may contribute to the design philosophy of user-centered design, especially in viewers' involvement in logo design work and design flow. The Emotion Engineering approach in this research introduced F.V.S.A. analysis and the combination of Gestalt theory in the design elements analysis section. This research suggested that to analyze non-tangible products such as logos; each design element could be divided according to gestalt theory. The design elements could be calculated in such a way for better understanding. Hence, it could be considered a benchmark for a revised analysis using the emotion engineering approach.

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