# DEVELOPMENT OF A DESIGN FRAMEWORK TO CREATE AWARENESS OF BAKERY FOOD INGREDIENTS INFORMATION FOR PARENTS IN KLANG VALLEY

KASTURI PORMALU @ PERUMAL

UNIVERSITI PENDIDIKAN SULTAN IDRIS

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# DEVELOPMENT OF A DESIGN FRAMEWORK TO CREATE AWARENESS OF BAKERY FOOD INGREDIENTS INFORMATION FOR PARENTS IN KLANG VALLEY

KASTURI PORMALU @ PERUMAL

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"*vazhga valamudan"*

Kasturi Perumal.

# ABSTRACT

Malaysia is famous for its variety of foods. However, the most common staple is bread, especially among busy parents. Despite multiple health problems rising among children, parents' understanding and awareness of food ingredient information are lacking. The design elements diminish the effective delivery of the message of the bakery food ingredients' information. Therefore, based on the problems identified in the design elements, this research aims to develop a Bakery Food Ingredient Information (BFII) framework. As the study is a sequential explanatory mixed-method, a QUANTITATIVE-QUALITATIVE research design is used. Data were gathered by giving survey questionnaires to parents and doing in-depth interviews with graphic design experts using semi-structured questions. In the quantitative survey, 700 questionnaires were sent to parents in the Klang Valley with children between the ages of 7 to 12. The survey used a stratified random sample method. A total of 456 questionnaires were finally used in this analysis. Qualitative data were gathered through in-depth interviews with ten design professionals whom a well-known design agency chose to take part in the interviews. The quantitative data were analysed using the Statistical Package for Social Science (IBM SPSS) version 25.0. Qualitative data were coded using the thematic procedure, and N'Vivo software aid was adopted. The findings revealed that re-designing the bakery food ingredients' information was not practical; therefore, the experts proposed a QR-code smartphone application design to present the BFII. By using this method, it would be more convenient to assess the necessary information. Similarly, the findings suggest more cooperation among manufacturers, design agencies, and NGOs (wREGA) in developing the QR-code application design. This future project needs financial support from investors and a strong commitment from the government. Finally, the research findings present a QR Code user interface design and a BFII label design as reference models for the future.

# DEVELOPMENT OF A DESIGN FRAMEWORK TO CREATE AWARENESS OF BAKERY FOOD INGREDIENTS INFORMATION FOR PARENTS IN KLANG VALLEY

## ABSTRAK

Malaysia terkenal dengan pelbagai jenis makanan. Salah satu makanan ruji yang paling ringkas adalah roti, terutamanya di kalangan ibu bapa yang sibuk. Walaupun terdapat banyak masalah kesihatan di kalangan kanak-kanak, kefahaman dan kesedaran ibu bapa mengenai maklumat kandungan bahan makanan adalah kurang. Elemen reka bentuk mengurangkan penyampaian mesej maklumat bahan kandungan makanan roti dengan berkesan. Oleh itu, berdasarkan masalah yang dikenal pasti dalam elemen reka bentuk, penyelidikan ini bertujuan untuk mengembangkan kerangka maklumat bahan makanan roti (Bakery Food Ingredient Information, BFII). Oleh kerana kajian ini adalah kaedah campuran penjelasan berurutan, reka bentuk penyelidikan KUANTITATIF-KUALITATIF digunakan. Data telah dikumpulkan dengan memberikan soal selidik tinjauan kepada ibu bapa dan melakukan temu bual mendalam dengan soalan separa berstruktur dengan pakar reka bentuk grafik. Pendekatan sampel rawak berstrata digunakan dalam tinjauan kuantitatif, dan 700 soal selidik diedarkan kepada ibu bapa di Lembah Klang yang mempunyai anak berusia antara 7 hingga 12 tahun. Sebanyak 456 soal selidik akhirnya digunakan dalam analisis ini. Pendekatan temu bual mendalam digunakan untuk mengumpulkan data kualitatif, dari sepuluh profesional reka bentuk yang dicalonkan dari agensi reka bentuk yang mapan untuk berpartisipasi dalam wawancara. Data kuantitatif telah dianalisis dengan menggunakan sistem Pakej Statistik untuk Sains Sosial (IBM SPSS) versi 25.0. Data kualitatif dikod dengan menggunakan prosedur Tematik, dan bantuan perisian N'Vivo digunakan.Hasil kajian menunjukkan bahawa perancangan semula maklumat bahan makanan roti bukan penyelesaian yang praktikal. Oleh itu, pakar mencadangkan reka bentuk aplikasi telefon pintar kod QR untuk meyampaikan maklumat ramuan roti (BFII). Dengan menggunakan kaedah ini, maklumat yang diperlukan boleh dinilai dengan lebih mudah. Begitu juga, penemuan ini menunjukkan lebih banyak kerjasama diantara pengeluar, agensi reka bentuk, dan NGO (wREGA) dalam mengembangkan reka bentuk aplikasi kod QR. Projek ini memerlukan sokongan kewangan daripada pelabur dan komitmen yang kuat dari kerajaan. Akhir kata, penemuan penyelidikan menunjukkan bahawa reka bentuk antara muka pengguna QR Code dan reka bentuk label BFII sebagai model rujukan untuk masa hadapan.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| ANOVA | Analysis of Variance |
| BFII | Bakery Food Ingredient Information |
| NGO | Non-Profit Organization |
| QR | Quick Response |
| QUAL | Qualitative |
| QUAN | Quantitative |
| SPSS | Statistical Package for the Social Sciences |
| Wrega | Graphic Design Association of Malaysia |

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# CHAPTER 1

# INTRODUCTION

## 1.1 Background of The Study

Information design is the study and practice of bringing clarity and comprehensibility to visual materials to direct, teach, inform and explain them to the general public (Few, 2011). At the same time, information design aims to develop an effective communication form that impacts consumers. Besides that, information design applies to a vast range of methods, including infographics, signs, packages, slides, forms, manuals, instructions, websites, maps, equipment displays, keypads, publications, menus, and commercials. Therefore, information design influences customers who read the information to find what they need, understand what they see and use what they purchase, as established by Redish (2000) and Black, A., Luna, P., & Lund, O (2017). As such, the information provided functions subtly on the psychology and imagination of the customers.

In order to develop a successful document or any other type of communication medium, such as a website, software application, or hardware device, entails a process that starts with understanding what the producers are trying to achieve, who use the items, and how they use them. (Redish, 2000; Black, A., Luna, P., & Lund, O. 2017). Krum (2014) and Marcus A & Wang W. (2019) mention that the information design's essence is data presentation. As such, data presentation has made material design a multipurpose communication tool for centuries, but many have never grasped its purpose and presence. Information graphics, infographics or data visualisation are the other names of Information Graphics. They are also recognised as "the science of visualisation" or "the art of science" because humans can visualise or perceive information through their eyes and minds. It is a fundamental principle of cognitive psychology, which explicates what the human mind captures and what it chooses to comprehend.

However, Few (2011) believes what a person sees can be controlled by employing the information design created and arranged that conforms with inherent human behaviour. McLeod (2008) and Pontis S. (2018) similarly emphasise that cognitive psychology perceives the individual as a processor of information, just like how the computer absorbs the information and trails a program to produce an output.

Information designs make it easier to communicate and articulate narratives to the public. It is the art of visualising and presenting complex data in an easy-to-understand and appealing manner. Few (2011), Krum (2013) and Guzzetti & Barbara (2015) mention that the three objectives are to inform, entertain, and persuade the audience and audience. Data and information are essential, powerful, and persuasive combined with good narratives (McLeod, 2008; Marchese, M, 2021). However, the

effectiveness of communication is determined by design. If the designers provide the wrong infographic/ information design with a cohesive narrative and details, its efficacy and impact can be futile. Generally, the application of design elements plays an essential role in communication. Necker (2016) identifies that data that needs to be more creative and better-executed needs to provide sufficient information.

Vyas (2015) indicates that the correct design elements can communicate independently in information design. Thus, clever and creative manipulation of the design elements on package labels can influence consumers' decisions. In this process, Frost (2014) emphasises that design elements like colour, space, and typography can warn, teach, explain, entertain, and control the buyers by presenting the content clearly and uniquely and engaging them by appealing and targeting their senses.

Furthermore, past studies have shown that design elements like colour, typography, and space arrangement can help consumers purchase the products when completely comprehended (Wong & Chou, 2012; Konstantoglou, Folinas & Fotiadis, 2020). The design elements (colour, shape, image) of a package are precise reflections of the characteristics of the products that carry messages about them (Burke, 2000; Barbosa et al., 2020). An essential part of successful business practice relies on good packaging design. Many companies invest a substantial sum of money in it.

The argument above shows that attractive packaging draws consumers' attention and influences them. Imiru (2017) endorses that packaging is a communication device providing details about the product, including contents, ingredients, price, nutritional values, cooking instructions and expiry dates.

According to the Rochester Institute of Technology, New York, food ingredients information falls under an information design category; the researcher has chosen bakery food ingredients information for this study. A study by The Star Online (2017) indicates that the Malaysian market has seen a growth in the demand for baked food as more products are consumed at mealtimes, replacing rice and noodles. Meanwhile, several studies by the University Kebangsaan Malaysia (2013), the Consumers Association of Penang (2017), and The New York Times (2017) have highlighted that children consume more convenience bakery food in schools than at home. Bread and cupcakes are common foods in the school canteens (Consumers Association of Penang, 2017).

Moreover, Crouch (2019) concludes that today's bread is full of chemicals and additives, especially white bread, which is one of the most chemically contaminated foodstuffs. Additives are chemicals added to loaves of bread either directly or indirectly during the processing, storing, or packaging, which help to prolong the shelf-life and enhance the nutritional value or flavour. Nevertheless, all these "processing aids" (chemicals) in the food ingredients are not openly stated on the labels (Vilibert, 2014 & LC Gioia, JR Ganancio, CJ Steel, 2017).

Survey results by the Consumer Association of Penang Guidebook (2015 & 2020) revealed that most processed food labels did not tell the truth. They also misled consumers with ambiguities and violated food laws in the process (The New York Times, 2017; Consumer Association Penang (2015 & 2020)).

Furthermore, The New York Times (2017) declares that young children go through many health problems early in their lives. Daily sugar consumption in food is increasing and steadily getting worse, more than people can imagine. Indeed, all forms of food contain sugar directly or indirectly, with various names. The younger generation, especially children, are victims of all these flavoured foods that lead to chronic illness and slow health degeneration. Only a few people understand the seriousness of health issues and make judicious food choices. Although many understand, they fail to educate their children on healthy food consumption.

The distinct display of helpful information on bakery ingredients may help parents select healthy baked food. By carefully reading the information, one may avoid complications such as allergy, obesity, diabetes, heart disease and high blood pressure, which has become a severe public health problem. Furthermore, the information on food ingredients is of great help in guiding parents with children with health issues. The inscriptions written on packages and the visual aspects that include colour, images, spokes-characters, and front-of-package claims, can help understand a food product. The information on bakery ingredients helps to make the correct decision to purchase suitable food for their children to live a healthy life ( Elliott, C.1). & Brierley, M. (2012) and the Malaysian Dietary Guidelines for Children and Adolescents (2016).

However, Shafie & Azman (2015) documented that the effectiveness of food ingredient information design is questionable. Chien, Chien, Chang, & Chen (2018) claim that food ingredient information misleads parents with ambiguous food ingredient information. Furthermore, Joshi, Mofidi, & Sicherer (2002); Silayoi (2007); Ramli, N. Amin, N., Zawawi, M, and Aziz, N.A. (2018) confirm that the technical terms used in the food ingredient information are challenging to understand, added with

crowded information. Additionally, most consumers are confused with the information presented on the packaging due to the ineffective application of design elements (Anith Liyana Amin Nudin, Mohd Amin Mohd Noh, Wan Nur Khalisah Shamsudin, Izwan Abdul Ghafar, Norsharina Samsuri & Nik Narimah Nik Abdullah, 2016).

Besides, an evaluation of the packaging shows that participants preferred factors that improved readability, such as increased font size, use of design elements and colour to highlight the concentration of the active ingredient and show the contrast between the font colour and background (Emilia da Silva Pons, 2019). Thus, the past findings prove that a change in presenting bakery food ingredients information is highly needed. Hence, this research identifies an effective bakery food ingredient information solution through a framework design.

Additionally, parents must realise the seriousness of healthy food choices and the importance of scrutinising the information about the food ingredients. The design and appearance of the information on food ingredients are essential as they are an effective communication link with the consumers. This study fills the literature gap by conducting research that combines the current and proposed design solutions onto the ingredient information labels to help consumers make healthier food choices. In particular, this study focus on parents who desire a healthy lifestyle but ignore the need to read the food ingredients on labels.

Hence, firstly this study was designed to identify awareness of bakery food ingredient information among parents concerned with their children's health. Secondly, it was to study the effectiveness of design elements of the information on bakery food ingredients. Thirdly, the attempts to identify whether parents can read and identify the

components or sources of the ingredients. In this situation, design elements such as colour, font size and layout arrangement (space) influence readability, legibility, and visibility.

Therefore, this research analyses the effectiveness of the information on the food ingredients by studying the design elements that convey important messages. Additionally, this research presents a suitable information framework for bakery food ingredients from a practical perspective. A focused professional group validate the framework's design and provide a better guideline for future research. Lastly, this study develops and proposes a design solution for bakery food ingredient information for future practice.

## 1.2 Problem Statement

The packaging information elements of food product descriptions are essential, especially the food ingredient information. The effectiveness of this food ingredient information has a strong association with the use of design elements (Anja Zorko, 2017). The packaging information and design elements are colour, shape, typography, size, label format, image, and material selection (Heer Vyas and Bhuvanesh. V; 2015). These design elements play a significant role in delivering messages as they represent practical bakery food ingredient information.

The role of design elements in presenting product packaging information has received far less attention, which suggests that manufacturers and designers have to consider this issue seriously (Anith Liyana (2016). When design elements are weak, it influences the effectiveness of bakery food ingredient information.

Nevertheless, the food ingredient information section on the packaging is more of a template format. The manufacturers apply it for the sake of law enforcement and not to communicate their messages (Anith L.A.N, 2016). Therefore, visibility and readability are not the priority of the manufacturers. Furthermore, the manufacturer prefers to apply corporate colours to the entire packaging without thinking about the visibility and legibility of the bakery food ingredient information (BFII). They aim to promote sales and increase profit (Heidenstrøm, N.,2019). Because of the corporate colour application, the background and font colour mismatch diminishes visibility. Furthermore, the colour choice worsened due to printing techniques, selection of materials and space constraints.

Many researchers highlight the influence of design elements in presenting packaging information design. J Suresh Kumar (2017) and Nicoleta Andreea NEACŞU (2015) explain that the classic design elements of packaging are: shape, colour, and graphics are crucial in delivering (ingredient or nutrition) packaging information. Based on Ageliki's (2020) characterisation, the physical look of the BFII in this study has been classified into four design elements. The packaging information font colour, background colour, font size, and layout design are independent variables, and the product packaging is the dependent variable of this present study.

Based on A.A. L Barbaso (2020), background colour, font colour, font size, and layout arrangement played an equally important role in determining the effectiveness of bakery food ingredient information. Nyilasy (2017) declared that the background and the font colour played a significant role in understanding food ingredient information. Additionally, Anja Zorko (2017) recommended black text on a white background because this combination is considered best to enhance readability. Besides, the font size also affects the legibility and readability of the bakery food ingredient information. The rationale for a suitable font size for bakery food ingredient information is to reduce the time spent finding the needed information.

Likewise, layout design combines and arranges elements, such as text, colour, graphics, and others. A good layout can improve visibility and communicate information effectively. However, in the present situation, the amount of product information on the packaging is overwhelming. The use of dual or triple language for bakery food ingredient information in Malaysia creates space constrain and makes the layout design more challenging. Shafie & Azman's (2015) findings on food packaging information prove that there are weaknesses in using design elements.

Azimah, Azrina, Norhaizan, Mohd Sokhini, & Daud (2013) indicate that the consumption of bakery food among Malaysian is drastically increasing. The consumer survey result revealed this finding by PURUTO Taste / Tomorrow (2020,) an online article from when the Covid-19 pandemic increased Malaysian consumption of bread. Previously bread, which once was a healthy food, has become hazardous, as revealed after several studies. Bakery products of the four leading foods (semisolid fats and cooking oils, fast foods, fried foods, and baked products) have contributed to Trans Fatty Acids (TFA) intake. This food causes adverse changes in the human body

(Azimah et al., 2013; Clemens, Hayes, & Reddy, 2017). These Trans Fatty Acids (TFA) cause high blood cholesterol, which leads to an increase in cardiovascular disease (CVD), and develops type 2 diabetes mellitus and cancer (Siti Nurshahbani & Azlan Azrina, 2014; Tierney and others, 2017). Therefore, understanding bakery food ingredients information is crucial for a healthier nation.

As highlighted, parents' actions and awareness of food labelling are important as it is an important issue. Safie and Azman (2014) stated that food ingredients might create adverse allergic reactions in some children, so parents need to monitor the types of food ingredients consumed by their children. So they believed that reading and understanding the food ingredient information would help parents to avoid adverse reactions to their children's health. As such, reading food ingredient labels is vital for parents with children with health complications. Parents should gain knowledge of food to prevent food allergies among their children, which might sometimes be fatal reactions (Shafie & Azman, 2015). Thus, this study identifies a wide gap between parents' awareness and their understanding of design elements of bakery food ingredient information. The ability and awareness among parents to understand the BFII will lead to a practical design and better delivery of information.

Besides, issues about transparency in conveying the food ingredient information are vital. This study will look into the effectiveness of bakery food ingredient information on a broad spectrum. Several studies have shown that consumers make purchase decisions contingent on what they perceive on the food ingredient information labels (Zul Ariff Abdul Latiff, Nur Aisyah Ruslee, & Mohamad Amizi Ayob, 2016). When parents can read and understand the food ingredient information, it will be easy

to make a purchase decision without hesitation. Furthermore, it is a lawful right of the parents to choose healthy and safe food for their children.

Nevertheless, manufacturers should not provide misleading food labelling, which can create confusion among parents (Shafie & Azman, 2015). It is the responsibility of the manufacturer to ensure that parents understand the content of the food they purchase and consume. Based on the context of this study, bakery food ingredients may have several adverse reactions, especially for children who suffer from allergies and eczema. Thus, it is essential for the manufacturers of bakery food to precisely deliver precisely their message. The aim of manufacturers should be to ensure that the parents understand the content of the food ingredient information clearly because it will help them choose healthy food (Elliott C1. & Brierley M., 2012). Hence, this study concerning a suitable framework for information distribution in food labelling is crucial.

Moreover, awareness and understanding are essential, as ineffective communication about food labelling can lead to severe allergies among children (Gupta et al., 2011). After conducting a survey in Klang Valley, Dr Amir reveals that Malaysians lack awareness of allergies as food allergies among children are reaching an epidemic level (The Star Malaysia, July 2016). All these research findings remind us of the Malaysian Dietary Guidelines for Children and Adolescents. The Guidelines urge parents to educate their children on the information found on the food labels (Ministry of Health Malaysia, 2013). The severity of food allergies reveals the importance of adequate food ingredient information for children's health.

Besides, the perception and use of the food ingredient information have correlated with demographic factors, which include gender and education. Studies dealing with nutrition-label literacy that differ across demographic factors are limited in Malaysian contexts. (Ramdan and others, 2016). Petroviti et al. (2012) argue that the use of food labels among consumers is influenced by gender and education. Several studies have focused on product labelling and consumer food packaging information (Rose, 2012). The use of nutrition labels has been subject to gender differences, with most research demonstrating that women use nutrition labels more than men (Stran and Knol, 2013). Besides, higher-educated people are more conscious of food labels than lower-educated people (Aryee and others, 2019). Thus, this past study examines the role of demographic factors such as gender and education in food labelling.

Furthermore, the effectiveness of the food ingredient information relies on the application of design elements. Generally, the design of food ingredient information is not user-friendly and well-known to the public (Roberto & Khandpur, 2014). A case study on "Aisha Food Industry Sdn. Bhd." reveals that enhancement in packaging areas is required. Proper food packaging with clear information and design elements is crucial in marketing strategies (S. Kiumarsi, Jayaraman, Salmi Mohd Isa, & Varastegani, 2014). Consequently, design elements like colour, space/layout and font size (typography) can influence the comprehension of the contents of the packaging (Wang, 2010). These design elements are often used to communicate health risks effectively. For example, using semiotic conventions of colour can be beneficial for food labelling communication (Drescher, Roosen, & Marette, 2014). This above statement justifies that the wise use of design elements can promote an effective

information design. Thus, a comprehensive study on a suitable design that can ensure the successful distribution of information is essential.

Therefore, this study, conducted in the Klang Valley, aims to identify the awareness of ingredient information among parents concerned with their children's health. Besides, this study examines whether parents can read and identify the components or source of the ingredients clearly or not by looking at the design elements such as colour, font size and layout arrangement (space), which strongly influence readability, legibility and visibility. Therefore, this study will analyse the effectiveness of food ingredient information in conveying its message by studying the design element. Research on food ingredient information has hardly been conducted in Klang Valley, and this study can provide a better idea for further amendments to the design element in food ingredient information.

Thus, analysing and evaluating the effectiveness of the bakery food ingredients information fills the gap in understanding parents' expectations of their needs on the food ingredient information labels, and that can eventually lead to good designs for future practice. When parents can read and understand the food ingredient information, it is easy to purchase without hesitation. Furthermore, it is a lawful right of the parents to choose healthy and safe foods for their children.

This study also attempts to develop a framework to overcome the weakness in the design elements for bakery food ingredient information (BFII) based on the research findings of the current design. This study also recommends solutions and model ideas for future industrial practice. The researcher has been concerned with bakery food ingredient information's effectiveness and developing a solution by providing a

framework design. The researcher expects the framework design to help improve the bakery food ingredient information by effectively communicating its message.

## 1.3 Purposes of the study

This research intends to examine the relationship between the awareness of parents and bakery food ingredient information. In addition, the research also attempts to find out the effectiveness of the bakery food ingredient information based on the design elements among parents. Further, the study attempts to evaluate the factors that influence the effectiveness of bakery food ingredient information according to design experts' views. It is also the intention of this research to develop a framework for bakery food ingredient information.

## 1.4 Research Objectives

The objectives of this research indicate what is to be achieved by this study.

i. To identify parents' awareness of the bakery food ingredients information.

ii. To analyse the effectiveness of bakery food ingredients information based on the design elements among parents.

iii. To evaluate the factors that influence the effectiveness of bakery food ingredients information based on the perspective of design Experts.

iv. To develop a framework of information for bakery food ingredients.

## 1.5 Research Questions

The following research question has been designed based on the above research objectives. They are as follows:

RQ: What is the effectiveness percentage level of bakery food ingredients information among parents based on the context of the design elements?

Q1: What is the percentage level of awareness among parents of the bakery food ingredients information?

RQ2: What are the parents' opinions of bakery food ingredient information?

RQ3: What influences the effectiveness of bakery food ingredients information based on the design Experts' perspective?

RQ4: What is the design solution to improve the effectiveness of bakery food ingredients based on the design Experts' perspectives?

The research questions put forward in this section will be answered in Chapter 4 of this thesis.

## 1.6 Conceptual Framework of Research

A conceptual framework is a system that the researcher considers best to explain the development of the process to be studied (Camp, 2001). The conceptual framework is linked with the relevant theoretical concepts to promote and systemise the researcher's knowledge. The conceptual framework of this research was developed based on Extreme Formalist by Zangwill (2001 & 2005) and "Visual Rhetoric Theory by Sonja K. Foss (2005). This section explains the details of the conceptual framework, as shown below in Figure 1.1.

In this framework, the concepts from the theories were applied to study the effectiveness of bakery product ingredient information in the context of how design elements communicate their messages. The researcher has generated two propositions in response modes: (i) design element (form) characteristics of extreme formalism in establishing the design/image of bakery food ingredient information as a pure formal work with aesthetic properties. Second (ii) visual rhetoric presents the "nature" characteristic that covers the presentation aspect of bakery food ingredient information in delivering the messages effectively. The "function" and "evaluation" are the following characteristics that present the assessment process of bakery food ingredient information.

This study aimed to achieve the information design system by evaluating the application of design elements in BFII. In this process, parents with children from 7 to 12 years were given questionnaires to assess their awareness and understanding of the bakery food ingredient information in the context of design elements. As well ten Experts from the design industry were interviewed. According to the theory, the

Expert's explanation affirmed the design elements' criteria. The following are the criteria of the conceptual framework used in this study.

### 1.6.1 Design Elements

Fry's (1913) concern for the compositional order is confirmed through expressing volumes in space (Jacqueline V. Falkenheim, 1972). This compositional order led to the formal practice of design elements. Nick Zangwill (2001) characterises, "formalism has aesthetic/nonaesthetic properties. That means if something has an aesthetic property, it has some combination of nonaesthetic properties which is responsible for the aesthetic property". This statement means that aesthetic property /beauty should not be the main aim of design.

Extreme formalist criteria highlight that the "formal aesthetic properties are determined solely by an arrangement of design elements" (Nick Zangwill 2001). As such, the arrangement of design elements is known as the formal properties of an artwork/ design. Thus, the arrangement of background colour, font colour, font size and layout of bakery food ingredient information is analysed in terms of effective design elements practice.

#### I. Nature of image

Through the "nature of image", the purpose of bakery food ingredient information is studied.

## II. Function of Image

The second section of visual rhetoric refers to how the image operates for its viewer. Thus, the function of design elements was studied in this section to determine the effectiveness of BFII design elements.

## III. Evaluation of image

This section refers to the analysis or "assessing" of the image of bakery food ingredient information and how the conclusions are drawn.

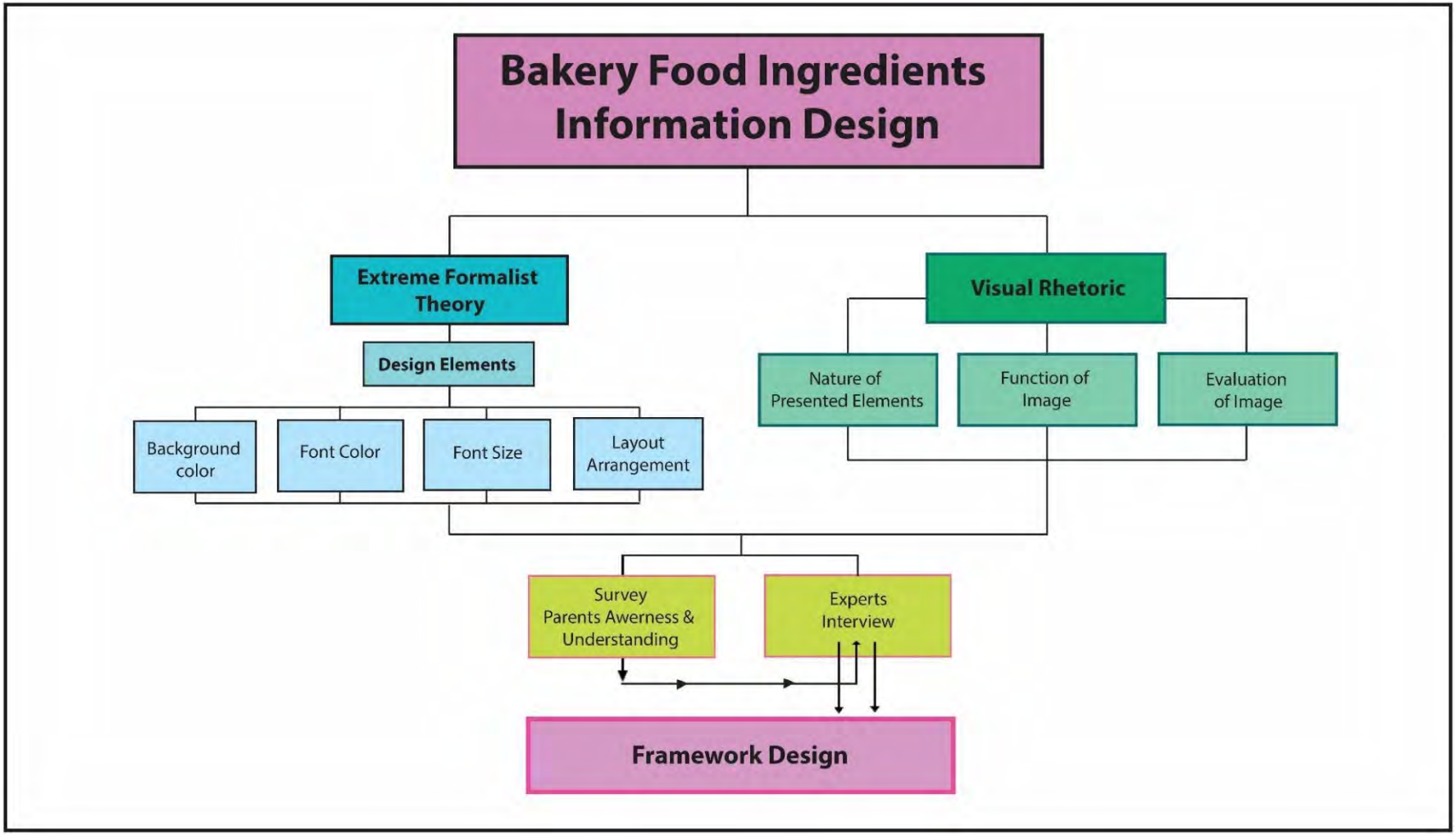


*Figure 1.1.* Conceptual Framework Developed by the Researcher of the Study.

## 1.1 Important of Research

This study's importance is providing the necessary input to food industries to improve their bakery food labelling design or system. As there is a lack of precise design of the current ingredient information of bakery food, the public tends to make purchasing decisions without basic knowledge and understanding of ingredients that lead to health hazards among children. This study attempts to develop or identify a design solution to overcome this problem. The importance of this study is:

(i) This study connects the application of design elements to the bakery food ingredient information, which makes the ingredient information's content visible and understandable mainly because of the designs. The information about the ingredients fails to reach the public, especially parents concerned about their children's health.

(ii) Thus, this study sheds some light on the need to effectively present bakery food ingredients to the public (parents). Besides, the research reveals numerous factors related to packaging design elements that can influence understanding.

(iii) The results from this research can be incorporated with the present labelling method to provide a solution to display the bakery food ingredient information that may not lead to any misconceptions among parents.

(iv) Meanwhile, this study can identify the possible recommendations from the analysis to be completed through the samples.

## 1.2 Scope of Research

This study focused on the understanding among parents of the design elements of bakery food ingredient information. The study was conducted among parents with children between 7 and 12 years old. Also, graphic design Experts who have experience of more than five years participated in this investigation. In terms of geographical coverage, the research only covered the Klang Valley. Specifically, the quantitative and qualitative strands' research area was restricted to the Klang Valley district. The limit of research scope to the Klang Valley is explained in the limitation of the site.

## 1.3 Assumptions

This study is conducted based on several assumptions and limitations:

i. The respondents are parents from different ethnic groups, cultural backgrounds, and education levels. These are the demographical factors.
ii. Respondents selected for this study are assumed to have adequate knowledge of food ingredients.
iii. The answers given by the respondents are assumed to be truthful without any bias or prejudice.

## 1.4 Study Limitations

This research aims to provide parents with individual awareness and understanding of the effectiveness of the design elements of bakery food ingredients. Nevertheless, the present study has several limitations that need to be stated. The limitation of this study is its scope of research and sampling procedure.

Furthermore, this study only focused on design elements and has yet to include other factors such as demographic, lifestyle, quality of products, and psychological factors that may affect the purchase intentions of parents. This study focuses only on local manufacturers' pre-packed bakery foods like bread, buns, and cupcakes. These food items are readily available at any convenience store, like 7- Eleven, Speed Mart, 99-Store, Hero Mart and hypermarkets like Giant, Tesco, Aeon, and others.

### 1.4.1 Limitation of Time

The time frame limited the research as it had to be completed on time. Another limitation of the study was that the researcher could not perceive answers because a structured questionnaire had been used to collect data from the survey population. Design elements are an extensive and vital subject, and only a few facets have been incorporated into the questionnaire leaving many areas of knowledge needing to be explored.

### 1.4.2 Limitation of Equipment/Facilities

The Covid'19 pandemic forced some limitations on this study. Data from four Experts were collected through an online meeting, although face-to-face interviews were planned. During the google meeting, the researcher faced a few technical problems, like the laptop's hardware being unable to support the recording process. Furthermore, the face-to-face interview recording also faced technical problems in the recording, where the clarity of the voices or sound system was poor. Thus, the researcher transcribed some parts of the interview based on her understanding.

### 1.4.3 Limitations of Site

This research was conducted in the Klang Valley, an urban area that encompasses the heartland of Malaysia's financial centre, modern industries and one of the fastest-growing metropolitan regions in the country. Klang Valley covers a geographical area from Rawang, north of Kuala Lumpur, to Sepang, bordering the Titiwangsa Mountain Range to Port Klang. It is the borders of Port Klang up to the Straits of Malacca. The comprehensive border coverage allowed the researcher to conduct an online survey that included corporate sectors, shopping malls, mini-markets, and schools. This data collected might not represent the total population and also may not represent the full racial distribution of Malaysia. The awareness and understanding among parents in the city area may differ from parents in the rural area. Parents in the city tend to have more food selections than parents in rural areas.

### 1.4.4 Limitations of Financial Support

Lastly, the researcher found that finance was another limitation of current research. To give a token of appreciation to the participants, The researcher could not obtain any grant to assist her in the study. As such, even the token of appreciation to the participants was from theresearcher's pocket.

These were the limitations and difficulties identified by the researcher during this study.

## 1.5 Operational Definitions

In this study, the following terms carry a specific definition.

### 1.5.1 Parents

The parents involved in this study were couples between the ages of 20 and 60, with children between the ages of 7 and 12 years old. This group of parents were the respondents of this study. This age limit was due to their late marriages.

### 1.5.2 Children

This study only refers to children between 7 and 12 years old. These children have started schooling, and parents focus on providing quality food to improve their mental and physical growth to compete with other children of the same age group.

### 1.5.3 Awareness

"Awareness" refers to parents' knowledge or perception of bakery food ingredient information "image" as defined in this study.

### 1.5.4 Design Elements

"Design elements" in this study refer to the design elements of a graphic design portfolio. Generally, the design elements were studied under seven categories. However, this study selected design elements based on the "label images" of bakery food ingredient information. Besides, the identification of design elements of information labels is also mentioned by Ageliki (2020), A.A.L Barbosa (2020) and Heer Vyas (2015) in their studies.

### 1.5.5 Bakery Food

In this study, bakery food refers only to pre-packed bakery products ready to be eaten. Bread, buns, and cupcakes are categorised as food mentioned in this study. The selected bakery products in this research are Malaysian-made bakery products only.

### 1.5.6 Bakery Food ingredient Information (BFII)

"Ingredient" refers to any substance, including food additives, used in manufacturing or preparing food and present in the final product. However, these are likely to be in a modified form. The ingredients are arranged in descending order of predominance in weight. This arrangement denotes that the ingredient that weighs most is at the top of the list, and the ingredients that weigh the least are at the bottom.

### 1.5.7 Brand

In this study,"Bran" refers to the bakery product images used in the survey. Around ten bakery products were used and labelled as Brand A to Brand J in the discussion.

## 1.6 Summary

This chapter is the introductory chapter and is subdivided into ten parts; that cover the research introduction, background, problem statement, the purpose of the study, research objectives, research questions, theoretical framework, conceptual framework, the importance of the study, study limitations, and the operational definition of terms and chapter summary.