

Customer-based Menu Layout Design and Labeling Indices

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Abstract

This study focuses on the attribute classification and performance assessment of the layout design and labeling indices for high-priced restaurants' multi-page menus. Based on these indices, we set up customer questionnaires and use an importance-performance analysis grid to assess their performances, presenting that most indices' execution is below customers' expectations. Moreover, we employ the Kano model to identify the classification attributes of the indices, including 2 Attractive quality indices, 6 Must-be quality indices, and 16 One-dimensional quality indices, and determine 5 key indices. Lastly, this study provides suggestions on designing the menu layout.

Keywords: Menu, layout design and labeling, importance-performance analysis, Kano two-dimension quality model

JEL Classifications: D12

1. Introduction

A menu is a restaurant's spokesperson. It can be a tool for providing food safety information, it can be an advertisement to help consumers know about the goods provided by the restaurant, and it can help influence consumers' willingness to purchase. In this respect, a menu is an indispensable tool for restaurant businesses (Bosheff, 2002). When consumers come across goods they are not familiar with or when the information provided on a menu is incomplete, it is likely that they will not choose to purchase them (Ryu and Zhong, 2012). Therefore, making information available on the menu is of great importance to restaurants.

To some extent a menu serves as a communication channel between restaurants and consumers and also denotes a contract between the seller and the buyer, because the information on a menu has a legal effect (Mill, 2001). In an effort to safeguard the rights of the consumers, in 1997 the Food and Drug Administration (FDA) of Taiwan passed the Truth-in-Menu Law, which mainly regulates the nutritional content of foods on a menu and their restorative effects, sources, portions, and cooking methods. The FDA subsequently passed the Health Care Law in 2010, requiring chain restaurants to indicate information on their menus, including nutritional ingredients, calories, and fat content, and the health risks to high-oil and high-sugar diets (Pizam, 2011). Taiwan's regulations on menu labeling

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management mainly focus on protecting consumers' rights and food safety management. The Act Governing Food Safety and Sanitation (2017) requires restaurants to provide country-of-origin labeling of goods, because asymmetric information between the seller and the buyer likely leads to losses and customer complaints, which are not good for both service providers and consumers.

Previous studies on menus (Ozdemir and Caliskan, 2014) mainly look at menu planning (Kivela, 2003; Glanz et al., 2007; Bernstein, Ottenfeld, and Witte, 2008), menu pricing (Shoemaker, Dawson, and Johnson, 2005; Hwang and Lorenzon, 2008; Raab, Mayer, Kim, and Shoemaker, 2009), menu design (Kwong, 2005; Burton, Creyer, Kees, and Huggins, 2006; Hwang and Lorenzon, 2008), menu analysis (Antun and Gustafson, 2005; Taylor, Reynolds, and Brown, 2009; Ozdemir, 2012), and menu engineering (LeBruto, Quain, and Ashley, 1995; Raab and Mayer, 2007). Most studies in the literature on menu design center on the layout of foods on the menu (Kincaid and Corsun, 2003; Reynolds Merritt, and Pinckney, 2005), menu labelling, information disclosure (Wansink, Painter, and Ittersum, 2001; Lockyer, 2006; Mills and Thomas, 2008; Pizam, 2011), the combination of nutritional ingredients (Kurato, Martin, Lan, Chappell, and Ahmad, 2000; Lee, Lee, and Shanklin, 2001), and descriptions of the menu items (Hwang and Lorenzon, 2008; McCall and Lynn, 2008). According to Cichy and Hickey (2005), menu design is the basis of the restaurant industry, and its purpose is to make consumers, employees, and restaurant investors feel satisfied with the restaurant. McCall and Lynn (2008), and Reynolds, Merritt, and Pinckney (2005) point out that menu design impacts the purchase willingness of consumers. This study aims to help the restaurant industry dispel consumers' doubt on restaurants' honesty and food safety and to attain consumers' confidence by properly providing information such as pricing, nutritional ingredients, and source of food on the menu.

Menu design affects costs, service process planning, and production sequence. In addition, consumers choose the food they will order mainly based on the information shown on the menu. Mill (2007) find that consumers often spend two minutes on average browsing a restaurant menu, and the combination of a well-designed menu and item promotions can lead to a 2% to 10% increase in volume of business. For demanding consumers at high- and medium-priced restaurants, menu content (pictures and words), layout, and texture may play an important role in the selection of foods listed. Previous studies on menu design mainly explore the needs of consumers and menu management, with evaluation models often structured based on the opinion of experts (Kotschevar and Withrow, 2008; Wang, 2014). In this aspect, the research results obtained are not applicable for evaluating consumers' perception on menu layout design and labeling, which involve how restaurants convey information to them. Therefore, the content and the extent of information that will be shown to consumers need careful assessment. Furthermore, consumers' opinion on the menu is very important as they are its ultimate users. However, there is insufficient research on an

evaluation model of menu layout design and labeling indices from consumers' perspective. There are even fewer studies in which Kano models help identify the properties of indices and in which Importance-Performance Analysis (IPA) helps evaluate the indices' importance and their performance. Thus, this study targets to fill this gap in the literature.

This study explores multi-page paper menus used by medium- and high-priced restaurants in Taiwan, including their menu layout design and labeling. We collect the related indices through an analysis and discussion of the current literature on menu design and labeling. Based on these indices, restaurant industry experts recruited by this study construct an initial model that evaluates menu layout design and labeling from the perspective of consumers. Next, we invite experts experienced in menu design to assess whether the indices taken into account in the initial model are appropriate. Based on the experts' evaluation, the study develops a questionnaire for a modified Delphi method on menu layout design and labeling indices and asks the experts to continually provide inputs for the questionnaire until all opinions collected reach a certain acceptable level of convergence. We then construct a formal evaluation model and design the final questionnaires on IPA and Kano Two-Dimensional Quality Model to evaluate the properties, importance, and performance of the indices, consequently indentifying key evaluation indices. Lastly, this study examines the influence of different indices on customers' satisfaction on menu layout design and the influence of their satisfaction on improving their impression about the restaurant. We offer the research results as a reference for medium- and high-priced restaurants when designing a new menu. Moreover, this study fills a gap in related literature for this area of the restaurant sector.

2. Literature Review

2.1. Studies on Menu Design and Labeling

Research on menu design and labeling cover several aspects. Mill (2001) advocates that the dishes on a menu should be properly described and priced in combination with any sales promotion to attract consumers. Antun and Gustafson (2005) indicate that consumers expect to obtain information, such as prices, good-looking appearances, product information, cooking process, etc. when reading a menu. A menu that provides too little information will not enable consumers to know the products of the restaurant and its operating style. Mills and Thomas (2008) point out that a menu that provides information such as quantity, quality, price, brand name, place of origin, images, purchase specifications, and preparation process will help consumers make the proper choices. In addition, Kotschevar and Withrow (2008) suggest that restaurants should establish an evaluation framework, fit for a restaurant menu with a specific style, that includes the operations of the restaurant (internal) and the needs of consumers (external). They advise that the easiest way to evaluate whether the menu design is valid is through an independent expert review using menu evaluation forms. This review includes 86 indices and 7 dimensions: (1) menu profitability, (2) presentation of text, (3)

menu comprehension, (4) physical support, (5) menu mechanics, (6) item selection, and (7) menu and item presentation.

Chen, Fang and Wu (2011) suggest indices that could be used to evaluate the design of a menu for theme restaurants and identify the framework and elements of the evaluation model, including 36 indices and 2 main categories: customer needs and business organization. Customer needs consist of food design, dish supply, service management, restaurant atmosphere, and overall feel of the restaurant, whereas business organizations consist of financial management and external and internal objectives. Wang (2014) explores the establishment and appropriateness of menu labeling indices from the perspective of experts and develops an evaluation framework consisting of 60 indices, 9 dimensions, and 2 factors: organizational goals (ethics, legal norm, education, and crisis management) and customer needs (dishes, placards, promotion, design, and proofreading).

To summarize the literature, studies on menu design and labeling aim to satisfy both organizational goals and customer needs (Kotschevar and Withrow, 2008; Chen, Fang and Wu, 2011; Wang, 2014); however, information displayed on the menu is closely related to customers' evaluation (McCall and Lynn, 2008). A menu that intends to satisfy consumer needs should be designed based on their perspective and must show information about the dishes and the restaurant (Bernstein, Ottenfeld, and Witte, 2008). Unfortunately, there is little research on the construction and performance evaluation of menu layout design and labeling indices from the perspective of customers.

Bosheff (2002) asserts that a menu may serve as an advertisement, as the menu information influences the purchase willingness of customers. Cichy and Hickey (2005) indicate that menu design aims to satisfy customers, employees, and restaurant investors. Reynolds, Merritt, and Pinckney (2005), and McCall and Lynn (2008) observe that a well-designed menu sways customers' purchase willingness. In this respect, restaurants should make good use of menu layout design and labeling so that they can attract more customers. Based on these results, the present study proposes the following hypotheses.

H1: The performance of labeling indices significantly affects customers' satisfaction with the layout of a menu.

H2: Customers' satisfaction with the layout of a menu significantly affects their impression on the restaurant.

2.2. IPA Matrix

Martilla and James (1977) first propose IPA as a simple and effective tool that analyzes the importance and performance of products or services. Managers can use IPA to measure the competitive position of a company in its market, to identify opportunities that could help a company improve its operation, and to guide a company in terms of operational strategies (Myers, 2001; Matzler, Bailom, Hinterhuber, Renzl, & Pichler, 2004).

IPA is often applied based on the collection and calculation of data about satisfaction (or performance) and importance from data obtained from a survey on customer satisfaction or service quality. In this matrix, the performance and importance of service attributes are the X and Y axes, respectively. The cutting lines of the X and Y axes divide IPA into four quadrants that represent the four different management strategies. Hollenhorst, Olson, and Forteny (1992) claim that the grand mean is used more often and more properly serves as the cutting point for X and Y axes than the median; thus, this study divides IPA into four quadrants using the grand mean. The quadrant where service attributes are located allows managers to clearly identify the advantages and disadvantages of the products or services that their company provides.

When a service attribute falls into Quadrant I (high importance and high performance), it means that the attribute is at a high level and that the company has an opportunity to gain or keep its strengths; this quadrant is thus called *Keep Up the Good Work*. When a service attribute falls onto Quadrant II (high importance and low performance), it means that the customers value the attribute, but its performance is relatively low; therefore, the company needs to pay close attention to its performance and improve it immediately. This quadrant is called *Concentrate Here*. When a service attribute falls onto Quadrant III (low importance and low performance), it means that the company does not need to invest efforts and resources into this attribute any more; thus, the quadrant is called *Low Priority*. Lastly, when a service attribute falls onto Quadrant IV (high importance and low performance), it means that the company may have invested too many resources into it; therefore, it would be better if the company considers reallocating the resources. Accordingly, Quadrant IV is *Possible Overkill* (Martin, 1995; Chu and Choi, 2000).

To summarize, research on the catering service industry has widely used IPA (Hollenhorst, Olson, and Forteny, 1992; Martin, 1995; Chu and Choi, 2000; Zhang and Chow, 2004; Kuo, 2007; Su, 2013). However, research on the performance evaluation of menu layout design and labeling has rarely employed it. Hence, utilizing IPA in a study can help provide valuable advice for restaurant owners in terms of menu layout design and labeling.

2.3. Kano Model of Two-dimensional Quality

The concept of two-dimensional quality first appears in the Motivator-Hygiene Theory by Herzberg, Mausner, and Snyderman (1959). Kano, Seraku, Takahashi, and Tsuji (1984) later adapt it and subsequently develop the Kano model of two-dimensional quality. As opposed to the model of one-dimensional quality that indicates that customers are already satisfied when the quality attribute is provided or fulfilled, the idea behind two-dimensional quality is that customers are not necessarily satisfied or may have neutral feelings when the quality attribute is provided or fulfilled. Before analyzing the Kano model, related data should be obtained through a survey questionnaire.

One can design the questionnaire with sets of two opposite questions - namely, positive questions (quality attributes are provided or fulfilled) and negative questions (quality attributes are not provided or unfulfilled) - with five possible responses each (Kano *et al.*, 1984). The survey aims to examine the perception of whether each quality attribute is sufficient or not. The five possible responses are: *I like it that way*; *It must be that way*; *I am neutral*; *I can live with it that way*; and *I dislike it that way*. After data collection, the quality attributes are categorized into Attractive quality (A), One-dimensional quality (O), Must-be quality (M), Indifferent quality (I), and Reverse quality (R) (Matzler and Hinterhuber, 1998). Different customers may have different evaluations for the same attribute. Each attribute gets a different cumulative number and percentage of attribute categories. Lastly, the statistically relative majority represents the standard for categorization.

Berger *et al.* (1993) propose the Customer Satisfaction Coefficient (CSC) to measure the extent to which customers' satisfaction, CS (1), increases and the extent to which customers' dissatisfaction, CS (2), decreases when a quality attribute has been improved. They calculate the coefficients of CS (1) (X axis) and CS (2) (Y axis) by the aforementioned cumulative number or percentage. Based on Berger *et al.*, (1993), one may calculate the average impact of a service attribute on satisfaction via $CS(1) = (A+O)/(A+O+M+I)$; and the average impact of dissatisfaction via $CS(2) = -(O +M)/(A+O+M+I)$. In addition, the grand mean of the two coefficients serves as the cutting line to draw a CSC matrix. What is worth noticing is that the attribute that falls onto Quadrant I has the biggest potential to increase customers' satisfaction and decrease their dissatisfaction. Accordingly, it is called the *Effective Improvement* area. The matrix becomes a reference when setting up key attributes and improving the order of attributes. Some studies apply the Kano model to examine the catering service industry (Pawitra and Tan, 2003; Chang and Chen, 2011; Chen and Chen, 2015). This study thus adopts the Kano model to categorize the menu layout design and labeling indices.

3. Methodology

This study explores multi-page paper menus used by mid- to high-priced restaurants in Taiwan, including menu layout design and labels. Based on expert evaluation, we utilize an improved Delphi method, IPA analysis, and Carnot two-dimensional quality model to evaluate the nature, importance, and performance of the indicators, consequently indentifying key evaluation indicators. Finally, the study examines the impact of different indicators of menu layout design on consumer satisfaction and the impact of satisfaction on improving restaurant consumer impressions. Figure 1 presents the research flow chart and research steps.

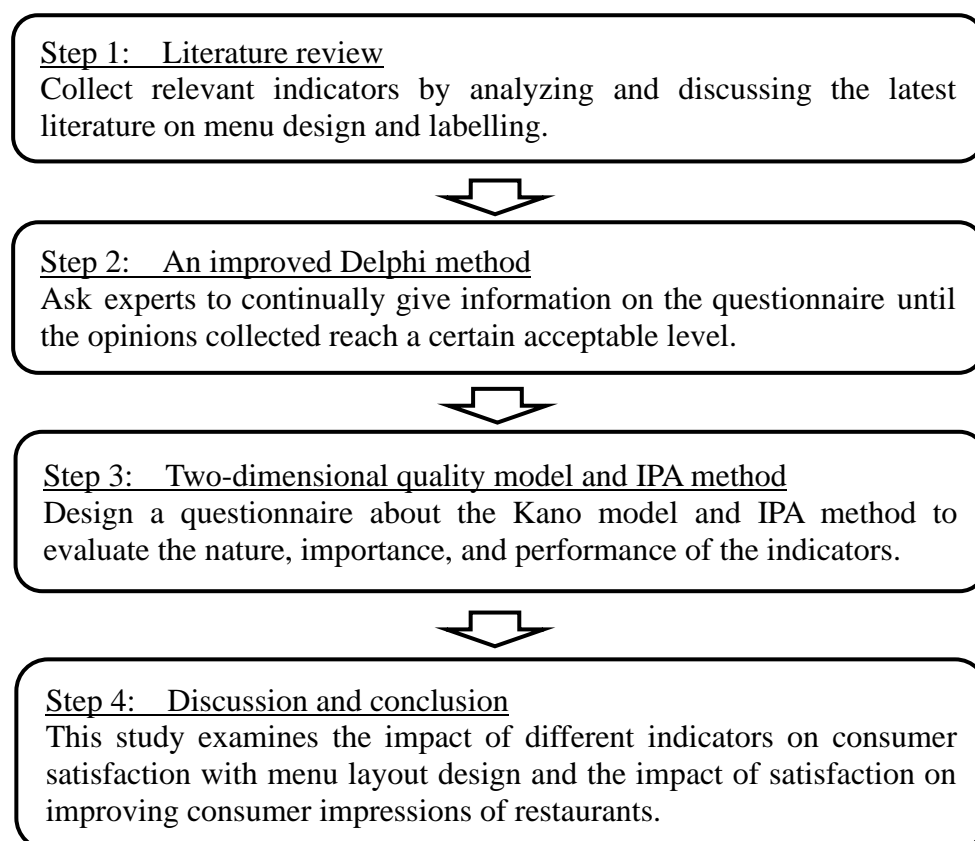


Figure 1: Research Flow Chart

3.1. Initial Model for the Evaluation of Menu Layout Design and Labeling Indices

After a literature review and analysis, this study adopts the menu evaluation forms by Kotschevar and Withrow (2008) and refers to the indices of Din, Zahari, Othman and Absa (2012). A panel of three experts met on the November 20 and 27, 2015 to discuss the related literature and to see opinions in terms of customers' perspectives. The discussions came up with the indices for menu layout design and labeling. With the advice on the modification of indices from the experts, we establish an initial evaluation model for menu layout design and labeling indices. The model includes 49 indices and 3 dimensions: information displayed on the menu (words and pictures), menu layout, and texture and appearance of the menu.

3.2. Selection and Modification of the Indices

3.2.1. Expert Content Validity

Kotschevar and Withrow (2008) propose a simple and effective way to evaluate a menu design through the examination and evaluation of experts, because their opinions are valuable. Therefore, we invited 15 experts experienced in menu design to appraise the appropriateness, representativeness, and completeness of the indices before designing the questionnaires about IPA and Kano. We asked them to offer their advice on the modification of the indices in order to improve the validity of the questionnaires. The questionnaires were designed based on Table 1. There are three options for each index: “Proper”, “Improper”, and “Proper after revision”. In addition, two blank columns are kept behind each dimension for the experts to add new indices so that important information will not be missed.

After collecting the appraisals of the experts, we remove a total of 8 indices out of 30 and add 1 index (*commodities fit for those with specific religious belief*). In total, 23 indices remain in terms of information displayed on the menu (words and pictures). As for menu layout, we remove 2 out of 13 indices and add 1 index (*the menu is bilingual: Chinese-English or Chinese-Japanese*) for a total of 12 indices. In terms of texture and appearance of the menu, we remove 1 (*the size of the menu is proper and easy to browse through*) out of 6 indices and add 1 index (*the texture and design of the menu are environmentally friendly*) for a total of 6 indices. In summary, 3 dimensions and 41 indices form the basis of the questionnaire design using expert reviews and the modified Delphi method (see Table 1).

Table 1A: Evaluation Model after Expert Content Validity and Modified Delphi Method

Dimension	Expert Content Validity	Modified Delphi method
Information displayed on the menu (words and pictures)	C1. Nutritional ingredients, such as calories	○
	C2. The grade label of verified food quality, such as the quality of beef and seafood	○
	C3. The place of origin of raw materials or the information about their production and marketing, such as the production area of beef or seafood	○
	C4. Certificate of examination of raw materials, such as organic, safe, non-poisonous, or natural	×
	C5. Seasonal goods	○
	C6. The relationship between the price and the unit (or portion), such as five Xiao Long Bao (steamed buns)/portion/NT\$100, or fried rice for three persons/NT\$200	○

Table 1B: Evaluation Model after Expert Content Validity and Modified Delphi Method

Dimension	Expert Content Validity	Modified Delphi method
Information displayed on the menu (words and pictures)	C7. Reminders on allergens, such as “The dish contains eggs and mangoes”	○
	C8. Dishes without prices labeled or with current prices or priced according to weights should be explained with words or pictures	○
	C9. Dishes are labeled with the major raw materials and seasoning	○
	C10. Clearly labeled “Genetically modified foods”	×
	C11. Clearly labeled “Chemical seasoning-free, such as no MonoSodium Glutamate (MSG), chicken powder, and lentionione”	○
	C12. The dishes served to customers should be in accordance with the words and pictures on the menu	○
	C13. Business hours of the restaurant	×
	C14. Trademark logo of the restaurant	○
	C15. Information on social media accounts such as websites, Facebook, and QR code	○
	C16. “Service charge” amount if it is added	○
	C17. “Minimum consumption” and “Holiday prices and daily prices”	○
	C18. “Payment methods (cash or credit cards that can be used to pay)”	×
	C19. “Extra service (takeaway service, home delivery service, and catering service)”	×
	C20. “Commodities especially designed for the elderly”	○
C21. “Commodities especially designed for children”	○	
C22. “Commodities fit for consumers who favor foods with low sugar, low oil, and low salt”	○	
C23. “Commodities fit for consumers with a specific religious belief, such as halal food certification”	○	
Menu layout	E1. The commodities of the same category are arranged on a menu according to their prices (in ascending or descending order)	×
	E2. The commodities are arranged on the menu based on categories	○
	E3. The commodities are arranged according to recommended categories	○
	E4. Words and pictures are clear and easy to read	○
	E5. The style and wording of the menu are in accordance with the decoration, atmosphere, and signs of the restaurant	○
	E6. The heading stands out and the font size is big enough and easy to identify	○
	E7. Proper spaces between commodities should be reserved	○
	E8. Recommend specials with a card or ribbon	○
	E9. Menu layout design and configuration are proper and allow customers to find the commodities that they want to order easily	○
	E10. The font size of the words is appropriate	○
	E11. The words on the menu are printed in a commonly used font	○
	E12. The menu is bilingual (Chinese-English or Chinese-Japanese)	○
Texture and appearance of a menu	M1. The menu is good looking and appealing	○
	M2. The shape and the size of the menu are appropriate and easy to browse through	○
	M3. The texture is durable and high quality	○
	M4. The menu is clean and tidy	○
	M5. There is no trace of revision or deletion on the menu	○
	M6. The texture and design of the menu are environmentally friendly	○

Note: ○ denotes that the index is retained; × denotes that the index is deleted.

3.3. Modified Delphi Method

This study invited experts to fill in the modified Delphi questionnaire for the modified evaluation model (Table 1) in order to establish a rigorous and concise evaluation model for menu layout design and labeling indices and to ensure the representativeness of the dimensions and indices. The modified Delphi method suggested by Murry and Hommons (1995) advocates a questionnaire developed based on the collation of a large amount of related literature. Traditionally, expert opinions form the basis of the questionnaire design. Comparatively speaking, the modified Delphi method saves time and improves the return rate of the questionnaires. As for the number of invited experts, Adler and Ziglio (1996) claim that 10 to 15 homogenous experts are needed. Couper (1984) suggest that at least 10 experts should continuously participate in the study before the research with the Delphi method is done. For this study, 20 experts experienced in menu design were invited to form the modified Delphi expert panel

The questionnaire focuses on the importance of the 41 indices and basic information. A five-point Likert scale (1 for *very unimportant* and 5 for *very important*) is the scoring method. Each dimension has two blank columns reserved for the experts to add important indices. Prior to the questionnaire development, the study asked the experts for their consent, informed them of the purpose of conducting the survey, and stated that two or more rounds of the survey may be conducted. Following the return of the questionnaires, we check and confirm the correctness and completeness of the data. Next, we analyze the data with Statistical Product and Service Solutions (SPSS) software to reach group consensus. The survey may be stopped depending on the stability of responses of the questionnaire. If the paired sample t-test for the two rounds of the survey reach the level of significance, i.e. $p < 0.05$, then there is a significant difference between the responses of those two rounds - that is, the responses of the questionnaire are not stable; otherwise, the responses of the questionnaire are stable and the survey can be stopped.

The questionnaires were handed out through e-mail. The first-round survey spanned February 22 to March 5, 2016. During this period, 20 copies were handed out; all returns are valid. The questionnaire for the second-round of the survey were based on the indices of the questionnaire (i.e., means and modes) used in the first round and the data obtained from the first round. The second round covered March 11 to 28, 2016. During this phase, 20 copies were handed out; all returns all valid. The result of the paired sample t-test is $|t| < 1.96$ ($p > 0.05$), which is insignificant. Therefore, it is not necessary to carry out the third round.

We make the selection of indices according to their importance or appropriateness. The higher the mean is, the more important or appropriate an index becomes. The mode shows the concentration of expert opinions. When the mean is ≥ 3.5 and the mode is ≥ 4 , it means that the expert panel thinks the index is important or appropriate, and it should be retained. We judge the consistency of expert consensus by the viewpoints of Faherty (1979) and

Holden and Wedman (1993). If the interquartile range of the panel's opinions for an index is < 1 or the standard deviation is ≤ 1 , then the panel reaches a consensus to some extent. The results from the first-round survey show that the appropriateness of the indices C4, C10, C18, C19, and E1 are poor (mean < 3.5); thus, we remove them. The opinions of the panel on the indices C10, C19, and E1 have low consistency (their standard deviation is > 1 or the interquartile range is > 1); thus, we retain them for the second round. The results of the second-round survey show that indices C4, C10, C13, C18, C19, and E1 have low appropriateness and moderate consistency (the standard deviation is ≤ 1 and the interquartile range is ≤ 1); therefore, we remove the 6 indices. In this way we are able to develop a formal evaluation model with 3 dimensions and 35 indices for menu layout design and labeling indices, as shown in the last column of Table 1.

Questionnaire design, sampling, and survey

This study design the questionnaire according to the formal evaluation model. The questionnaire consists of five parts: the first part includes the demographic variables such as gender, age, educational background, occupation, monthly income, consumption frequency per year, types of restaurant, etc; the second and third parts encompass the Kano quality model questionnaire, which consists of sets of two opposite questions (one positive and one negative) for each index with five options for each question as mentioned earlier; the fourth part contains the IPA questionnaire, which includes questions about the importance and performance of each index, measured using a five-point Likert scale (1 for *very unimportant* or *very dissatisfied* and 5 for *very important* or *very satisfied*); and the fifth part comprises two items: “*I am satisfied with the menu layout design and labeling of this restaurant*” and “*I have a good impression about the restaurant.*” These two items' scores also take up a five-point Likert scale (1 for *strongly disagree* and 5 for *strongly agree*).

This study utilizes the multi-page menu used by medium- and high-priced restaurants in Taiwan. Medium- and high-priced restaurants refer to those that serve local or foreign food through service personnels with a service charge, and each customer generally spends over NT\$500 (about US\$16.5) on average. By including the validity and the return rate of the valid questionnaires, we adopt purposive sampling and snowball sampling to obtain participants for the survey.

The sample customers are those who had dined at medium- and high-priced restaurants in the past one month. In total, there are twenty qualified respondents: four each from the manufacturing industry, service industry, and agricultural industry (agriculture, forestry, fishery, and animal husbandry), four students, two civil servants, one military personnel, and one teacher. Trained graduate students explained to the respondents the research purposes and how the survey is conducted. Subsequently, with prior consent from the initial 20 survey participants, each of them was respectively asked to invite about 40 eligible respondents to answer the questionnaire. To encourage them to participate, a present was given as a token of

appreciation. After survey administration, the returned questionnaires were examined and validated. The survey spanned April 5 to 26, 2016. During this period, 780 copies were handed out; 30 copies were not returned, and 44 were invalid. Total valid questionnaires are 706 for a return rate of 90.5%.

4. Analysis and Discussion

4.1. Sample Structure

Female respondents are slightly more than the males (percentage). Among the participants, 241 (30.3%) are between 36 and 45; 168 (23.8%) are between 26 and 35; 146 (20.7%) are between 46 and 55; and 136 (19.3%) are 25 years or younger. As for their educational background, 415 (58.8%) are bachelor degree holders; 150 (21.2%) are master's and doctoral degree holders; and 141 (20.0%) are senior high school graduates. In addition, 300 respondents (42.5%) are from the service industry 121 (17.1%) are from the manufacturing industry 100 (14.2%) are military personnel, civil servants, and teachers; and 92 (13.0%) are students. Most of them (39.8%, n=281) have a monthly income of NT\$30,001 to NT\$50,000; 214 (30.3%) have a monthly income of no more than NT\$30,000; 132 (18.7%) have a monthly income of NT\$ 50,001 to NT\$70,000; and 79 (11.2%) have a monthly income of no less than NT\$70,000. Among them, 257 respondents (36.4%) eat three to four times per year at medium- and high-priced restaurants; 159 (22.5%) eat five to six times per year; and 125 (17.7%) eat no more than twice per year. In terms of types of restaurants, 235 respondents (33.3%) frequent Western restaurants; 123 (17.4%) dine mostly at Japanese restaurants; 118 (16.7%) eat at cafeterias; and 106 (15.0%) dine at Chinese restaurants.

4.2. Validity and Reliability Analysis

We use Cronbach α to analyze the reliability of the importance and performance of the three dimensions. The values of Cronbach α for the three dimensions all exceed 0.8, which means that the scale has relatively high reliability (Nunnally and Bernstein, 1994). The study formulates the formal questionnaire, founded upon related literature about the catering industry, after examining content validity and uses the modified Delphi method to screen the indices. This gives the questionnaire good expert validity and content validity.

4.3. Classification of the Indices and Customer Satisfaction Coefficients

This study identifies and classifies the indices using Kano model and determines which of them could significantly increase customer satisfaction and decrease customer dissatisfaction according to the calculated CSCs. Table 2 shows the results of classification: Attractive quality (A) consists of 2 indices, C22 and M1; Must-be quality (M) consists of 6 indices, C8, C12, C16, C17, E2, and E7; One-dimensional quality (O) consists of 16 indices, such as C1, C2, C3, C6, C7, C9, C11, and E4; Indifferent quality (I) consist of 11 indices, such as C5,

C14, and M6.

Table 2: Classification and CSCs of Kano Two-dimensional Indices

Index	M (%)	O (%)	A (%)	I (%)	R (%)	Q (%)	Category	CS (1)	CS (2)
C1	9.07	34.99	26.77	26.91	2.12	0.14	O	0.632	-0.451
C2	21.25	30.17	24.08	23.23	0.57	0.71	O	0.549	-0.521
C3	23.80	29.89	20.40	24.22	0.71	0.99	O	0.512	-0.546
C5	10.06	15.16	32.15	41.36	0.85	0.42	I	0.479	-0.255
C6	23.09	36.97	14.16	24.08	0.71	0.99	O	0.520	-0.611
C7	20.54	30.88	21.25	25.64	0.85	0.85	O	0.530	-0.523
C8	29.75	16.86	14.02	23.23	3.54	12.61	M	0.368	-0.556
C9	16.29	35.27	18.27	28.05	1.13	0.99	O	0.547	-0.527
C11	17.14	31.87	24.36	24.93	0.85	0.85	O	0.572	-0.499
C12	40.65	34.42	7.37	16.29	0.42	0.85	M	0.423	-0.760
C14	10.48	10.62	19.69	58.22	0.57	0.28	I	0.306	-0.213
C15	6.66	9.07	26.35	55.52	2.12	0.28	I	0.363	-0.161
C16	46.88	33.43	3.54	14.02	0.42	1.70	M	0.378	-0.821
C17	46.60	32.15	5.95	14.16	0.71	0.42	M	0.385	-0.797
C20	10.06	19.69	30.74	38.81	0.71	0.00	I	0.508	-0.300
C21	9.77	19.97	31.73	37.82	0.42	0.28	I	0.521	-0.300
C22	9.49	21.67	37.11	29.60	0.85	1.27	A	0.601	-0.318
C23	0.14	13.31	22.10	48.73	1.98	13.74	I	0.420	-0.160
E2	33.14	19.12	20.54	26.06	0.71	0.42	M	0.401	-0.529
E3	12.18	18.98	26.63	40.93	0.71	0.57	I	0.462	-0.316
E4	29.89	45.33	9.49	14.59	0.00	0.71	O	0.552	-0.757
E5	15.72	32.72	25.64	25.21	0.14	0.42	O	0.588	-0.488
E6	18.70	30.88	24.65	24.93	0.57	0.28	O	0.560	-0.500
E7	31.59	23.09	20.54	24.22	0.28	0.28	M	0.439	-0.550
E8	8.64	9.63	30.45	46.46	4.25	0.57	I	0.421	-0.192
E9	23.09	37.68	15.30	23.09	0.28	0.57	O	0.534	-0.613
E10	21.53	30.59	21.95	25.35	0.28	0.28	O	0.528	-0.524
E11	14.16	16.57	19.97	47.88	0.99	0.42	I	0.371	-0.312
E12	8.92	10.06	26.20	52.97	1.56	0.28	I	0.369	-0.193
M1	13.74	21.39	35.98	28.33	0.28	0.28	A	0.577	-0.353
M2	22.38	33.57	18.70	24.65	0.57	0.14	O	0.526	-0.563
M3	20.82	31.16	22.24	25.21	0.28	0.28	O	0.537	-0.523
M4	32.72	44.05	8.36	13.74	0.71	0.42	O	0.530	-0.777
M5	21.81	30.74	20.54	25.07	0.71	1.13	O	0.522	-0.535
M6	11.47	25.07	25.21	37.39	0.42	0.42	I	0.507	-0.369
Grand mean								0.487	-0.469

Notes: 1. A: Attractive quality; O: One-dimensional quality; M: Must-be quality; I: Indifferent quality; R: Reverse quality; Q: Quality unable to determine. 2. $CS(1) = (A+O)/(A+O+M+I)$; $CS(2) = -(O+M)/(A+O+M+I)$.

As illustrated in Table 2, we use the grand mean of CS (1) and CS (2) as the cutting line to divide the CSC matrix into four quadrants. The values of CS (1) and CS (2) for all indices are in Figure 1. The Effective Improvement area consists of 15 indices, C2, C3, C6, C7, C9, C11, E4, E5, E6, E9, E10, M2, M3, M4, and M5. These indices all belong to One-dimensional quality. For restaurants that want to improve the performance of their menu layout design and labeling, the greatest benefits will appear if they take these indices into account.

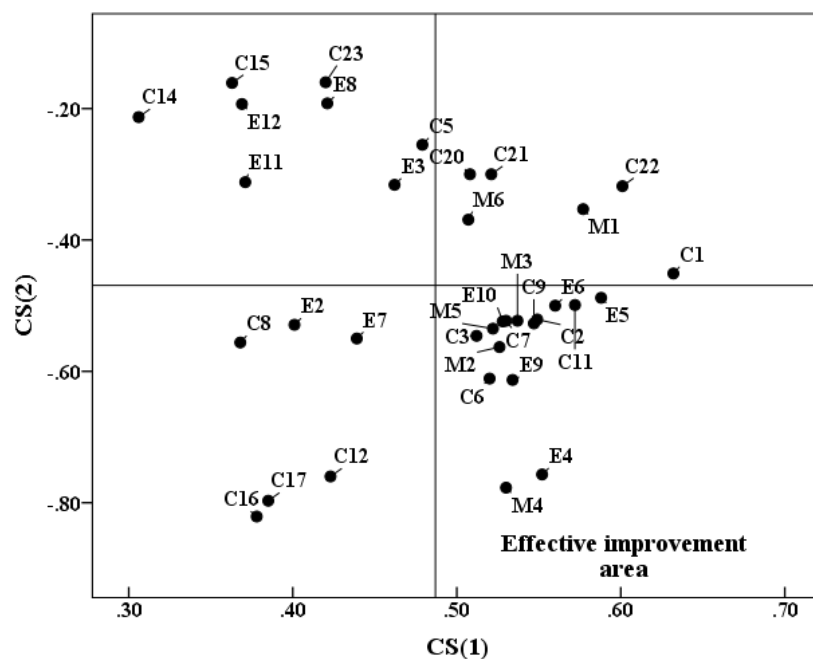


Figure 1: CSC Matrix

4.4. IPA Analysis

This study carries out IPA analysis for menu layout design and labeling indices. Table 3 shows that the grand mean for the performance of all indices is 3.50, and the grand mean for the importance of all indices is 3.85. We set these two values as the cutting points for the X and Y axes of IPA, thus forming the four quadrants. Table 3 lists and Figure 2 plots the means for the importance and performance of all indices. Eight indices are in the Concentrate Here area: C12, C7, C3, C2, C11, C8, C9, and C22 (arranged in descending order of importance). In the quadrant Keep Up the Good Work, there are 11 indices, including C6, C16, and M4. Ten indices are in the quadrant Low Priority, such as C1, C5, and M6. Lastly, 6 indices are in the quadrant Possible Overkill, such as E2, E3, and E5.

This study finds that the indices C2, C3, C7, C9, and C11 fall both into the Effective Improvement area as shown in Figure 1 and the Concentrate Here area as shown in Figure 2. These five indices are the key factors that should be taken into account when designing the menu layout for medium- and high-priced restaurants.

4.5 The Relationships among Menu Layout Design and Labeling, Satisfaction with the Layout Design, and Impression about the Restaurant

We set the overall performance of menu layout design and labeling as the independent variable and set satisfaction with the menu layout as the dependent variable when conducting the simple regression analysis. The standardized regression coefficient is 0.800 ($p < 0.001$), which means that the overall performances of menu layout design and labeling significantly

positively impact satisfaction with the menu layout. In other words, the greater the customers assess the performance of the menu layout design and labeling, the higher their satisfaction will be with the menu layout design. The results of multiple regression analysis show that the performance of each dimension exerts a significantly positive impact on satisfaction ($F=416.22$, $p<0.001$). Arranged based on descending order of influence, these dimensions are information displayed on the menu ($\beta=0.41$, $p<0.001$), menu layout ($\beta=0.29$, $p<0.001$), and texture and appearance of the menu ($\beta=0.17$, $p<0.001$). This result supports H1. The information displayed on the menu should be the first priority if a restaurant wants to improve customer satisfaction with the menu layout design and labeling, followed by prioritizing the layout as well as the texture and appearance of the menu.

Table 3: Descriptive Statistic of the Importance and Performance for each Index

Dimension	Index	Importance		Performance	
		Mean	Order	Mean	Order
Information displayed on a menu	C1	3.67	28	3.24	34
	C2	4.01	9	3.44	22
	C3	4.09	6	3.37	26
	C5	3.62	30	3.45	20
	C6	4.07	7	3.56	15
	C7	4.13	5	3.41	23
	C8	3.91	16	3.27	32
	C9	3.86	18	3.31	29
	C11	3.91	15	3.25	33
	C12	4.15	4	3.47	18
	C14	3.42	34	3.37	24
	C15	3.32	35	3.36	27
	C16	4.38	1	3.84	1
	C17	4.35	2	3.81	2
Menu layout	C20	3.66	29	3.27	31
	C21	3.70	26	3.35	28
	C22	3.85	19	3.28	30
	C23	3.62	31	3.23	35
	E2	3.76	23	3.54	16
	E3	3.68	27	3.51	17
	E4	4.05	8	3.74	4
	E5	3.78	21	3.60	12
	E6	3.93	14	3.63	9
	E7	3.77	22	3.58	14
	E8	3.45	33	3.37	25
	E9	4.00	10	3.68	6
E10	3.93	13	3.67	8	
E11	3.73	25	3.58	13	
E12	3.56	32	3.45	21	
Texture and appearance of a menu	M1	3.79	20	3.62	10
	M2	3.97	11	3.72	5
	M3	3.90	17	3.68	7
	M4	4.22	3	3.77	3
	M5	3.93	12	3.61	11
	M6	3.73	24	3.45	19
Grand mean		3.85		3.50	

positive impact on their impression toward medium- and high-priced restaurants. Therefore, a good menu layout design can help improve customer satisfaction and indirectly improve their impression about the restaurant. This study provides more research methods than other research in this field. Moreover, the results herein can serve as a reference for index selection, attribute confirmation, and importance and performance analyses of menu layout design and labeling, especially for the improvement of key indices when designing a menu layout.

5.2. Management Implications

5.2.1. Classification of Indices and Analysis of CSC Matrix

Based on the results, we categorize the indices “*Commodities fit for the consumers who favor foods with low sugar, low oil, and low salt*” (C22) and “*The menu is good looking and appealing*” (M1) under *Attractive quality*. This shows that consumers now value fitness and aesthetic feelings more. To attract the attention of customers, restaurant owners should offer a good-looking menu with quality texture and also label the commodities with “low sugar, low oil, and low salt” for consumers to choose. We categorize indices such as C8, C12, C16, C17, E2, and E7 under *Must-be quality*. The first 4 indices closely relate to customers’ benefits. The last 2 indices relate to convenience and comfort that customers experience while browsing the menu. The 6 indices are the most basic needs of customers for menu layout. Therefore, they should be taken into account during menu layout design; otherwise, it is likely that customers will be dissatisfied. The One-dimensional quality includes 16 indices: C1, C2, C3, C6, C7, C9, C11, E4, E5, E6, E9, E10, M2, M3, M4, and M5. It is advised that these indices be taken into account when designing a menu layout, because the more indices a menu has, the more satisfied customers will be. In addition, when restaurant owners want to improve the effectiveness of menu layout design and labeling, they can refer to indices in the *Effective Improvement* area of the CSC matrix, including 15 one-dimensional indices.

To summarize the research, the layout design of a multi-page menu used by medium- and high-priced restaurants from the perspective of consumers should include at least 24 effective indices (2 indices from *Attractive quality*, 6 from *Must-be quality*, and 16 from one-dimensional quality). According to the results, the remaining 11 indices like “*Seasonal goods*” (C5), which belong to *Indifferent quality*, are optional. Thus, restaurant owners can selectively take into account these indices depending on their specific needs.

5.2.2 IPA Matrix and Key Indices

There are eight indices in the quadrant *Concentrate Here* of IPA. We note that customers find these indices to be lacking, but deem them as important. Thus, medium- and high-priced restaurants should always consider them in menu layout design and labeling. Indices C12 (M), C7 (O), C3 (O), C2 (O), C11 (O), C8 (O), C9 (O), and C22 (A) all need improvements. As they are part of the 24 effective indices, they thus should be prioritized. Among them, the

following five indices fall in the *Effective Improvement* and *Concentrate Here* areas at the same time: “The grade label of verified food quality such as the quality of beef, and sea food” (C2), “The place of origin of raw materials or the information about their production and marketing, such as the production area of beef or sea food” (C3), “Reminders on allergens, such as ‘The dish contains eggs and mangoes’” (C7), “The dishes labeled major raw materials and seasoning” (C9), and “Clearly labeled ‘Chemical seasoning-free, such as no MonoSodium Glutamate (MSG), chicken powder, and lenthionine’” (C11). This means that these five indices are key for menu layout design and labeling. Nowadays, consumers pay great attention to healthy and quality food, and so it is advised that food materials, food sources, and allergens should be shown on the menu. In this way, consumers will eat at ease, will feel satisfied with the restaurant, and will have a good impression toward the restaurant.

5.3. Research Limitations and Future Research Direction

Although this study has carried out the survey as rigorously as possible, it still has limitations. Because of manpower and time limitations, the study employs purposive sampling and snowball sampling to obtain participants for the survey questionnaire. The sampling methods used affect the randomness of the sampling, which impairs the external validity of the research and weakens its reasoning. The present study also explores multi-page menus of medium- and high-priced restaurants; since the number of samples is limited, the representativeness of the study and the scope of inferences are both inadequate. In this aspect, it is suggested that future research expand the study scope, increase the number of samples, and improve the sampling method suitability. In addition, this study focuses on paper menus instead of e-menus; thus, the results are only applicable to paper menus of medium- and high-priced restaurants. Furthermore, we set up the model to evaluate the layout design and labeling of multi-page menus of medium- and high-priced restaurants, and so it is not specific to certain types of restaurants. Future research can explore e-menus and can establish an evaluation model for menu layout designs applicable either to all types of restaurants (basic indices) or to a specific type of restaurant (special indices).

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