

Full Length Research Paper

Consumer hierarchical value map modeling in the healthcare service industry

Wan-I Lee*, and Chia-Hui Lin

Department of Marketing and Distribution Management, National Kaohsiung First University of Science and Technology, Kaohsiung, 811 Taiwan R. O. C.

Accepted 17 May, 2010

Estimating consumer value is useful for comprehending consumers' need. Most research of consumer value focus on discussing single attribute but are incapable of exploring multi attributes to explore its entire connotation including attributes, consequences and values. However, it is important to understand what attribute do consumer care and their linkage in marketing decisions. The current study applies Means-End Chain (MEC) to model a healthcare consumer Hierarchical Value Map (HVM) as 3-tiers with line segments connecting related nodes at each level for understanding how consumers transform service attributes into their own value. The current study includes conducting the consumer categorization processes and Second order Confirmatory Factor Analysis (SCFA) to test the goodness-of-fit of consumer value model and analyze relationships between consumer value and satisfaction. Then, apply hard laddering to collect data for constructing a hierarchical value map. The study not only enhances the empirical insufficiency in results and value level of consumer value, but also confirms Holbrook's (1994c, 1996, 1999) eight types of consumer value including efficiency, excellence, status, esteem, play, aesthetics, ethics and spirituality on healthcare institutions. The results reveal that each attribute of excellence value is completely linked in three levels. On the other hand, the spirituality value has the weakest links in consumer cognitive structure where the number of linkage between attribute-result and result-value is the least. Finally, satisfaction in value level is linked with waiting time of outpatient services, administration procedures, registration service, range of services, attitude/courtesy of nurses, physician expertise and treatment effect in attribute level. These findings are relevant to issues concerned with healthcare in Taiwan and other developing nations which serve as an important reference for the healthcare service industry.

Key words: Consumer value, means-end chain, hierarchical value map, satisfaction, healthcare service industry.

INTRODUCTION

Consumers are at an information disadvantage under the situation where asymmetric information exists between consumers and healthcare providers in the traditional healthcare environment. As the Taiwan economy has markedly improved over the last two decades, the demand for high quality healthcare services has become prominent in the minds of consumers. Due to the increased public awareness as to what constitutes high quality healthcare, understanding consumers has become a matter of pressing importance among healthcare providers as they seek to attract and retain consumers. At

the present time, consumers are able to glean various kinds of information under different situations when they need to choose healthcare services. It is for this reason that creating consumer value is the key to business success and delivering consumer value can further develop consumer loyalty (Heskett, Sasser and Schlesinger, 1997; Reichheld, Markey and Hopton, 2000; Reichheld, 1994).

In order to understand how consumers choose healthcare services, managers need to understand the decision process, the consumers' behavior, and the basis for decision-making. Holbrook (1994c, 1996 and 1999) proposed the Means-End Chain (MEC) approach in order to explore how consumer value drives decisions. The analysis of the hierarchical contexts of consuming describes

*Corresponding author. E-mail: wilee@ccms.nkfust.edu.tw.

the relationship between consumers and products, services or actions. Meanwhile, the hierarchical value map (HVM) explains why the consumers' selection of certain products or services is helpful in terms of satisfying their goals. Therefore, managers may formulate their marketing strategy through the use of a MEC analysis in order to link consumer value with products or services.

Most past studies on consumer value in the healthcare services industry focus on discussing a single attribute but are incapable of exploring multiple attributes in order to understand the broader context that includes attributes, consequences and values. However, understanding the attributes with which the consumers are concerned and the linkages in marketing decisions is important. The current study applies MEC analysis to model a healthcare consumer HVM to understand how consumers transform the service attributes into individual consumer's value (for example, providing consumers with customized service). Preparing a HVM involves identifying the consumer categorization processes and engaging in second-order confirmatory factor analysis (SCFA) to test the goodness-of-fit of the consumer value model, as well as analyzing the relationships between consumer value and patient satisfaction. Hard laddering is applied in order to collect data for constructing a hierarchical value map. The study not only enhances the empirical insufficiency in results and value level of consumer value, but also supports Holbrook's (1994c, 1996, 1999) typology of eight types of consumer value, namely, efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality in relation to healthcare institutions.

LITERATURE REVIEW

Consumer value

Consumer needs and the available resources are important drivers of acquisition decisions for products and services (Hauser and Urban, 1986), and therefore identifying consumer value can provide measures that enhance the performance of companies (Keeney, 2001). Consumer value serves as the foundation of all effective activity and is the key to the formulation of a successful marketing strategy (Holbrook, 2006). In addition, comprehending consumer value and profitable consumers are essential to retaining consumers (Hawkes, 2000). Kotler (1996) asserts that the total consumer value is the difference between consumer value and consumer cost. Here, consumer value refers to the benefits a consumer expects from a particular set of goods and services, while Hilliard (1950) defines consumer value as an interactive relativistic preference experience which refers to the evaluation of some objective by certain consumers where the objectives may include any product, a service, a manufactured good, a social cause, and so on. By being

interactive, consumer value entails an interaction between a consumer and a service or product. By being relativistic, consumer value is comparative, personal, and situational. The term "preference" refers to the general concept of an evaluative judgment including a predisposition, attitude, opinion, directional behavior, valence, judgment, or evaluation. Finally, consumer value resides in the consumption experience derived from the purchased item (Holbrook, 1996). Consumers in the healthcare industry are always pursuing healthcare services that conform to the needs of value, and as such healthcare administrators must understand and fulfill their consumers' needs (Pan and Chen, 2004). The perceived value of healthcare to consumers results from the comparison between perceived quality and perceived cost (monetary and non-monetary), and further influences decision-making (Gooding, 1995).

Holbrook (1996) defines three key dimensions of consumer value, namely, the self-oriented, extrinsic, and intrinsic dimensions. Table 1 depicts the eight-celled typology of consumer value by treating each dimension as a dichotomy and combining each of them into a cross-table. 'Extrinsic value' further increases utility of consumption and belongs to a means-end relationship. 'Intrinsic value', on the other hand, emphasizes the value achieved through the consumers' experiences. When a consumer appreciates a product or experience in a selfish manner purely for his own sake, the value is 'self-oriented'. By contrast, a value that is other-oriented reflects how an individual gains utility from how a product or experience influences family, friends, colleagues, and so on. Active value has to do with the things done by an individual. Conversely, reactive value results from the things done to an individual.

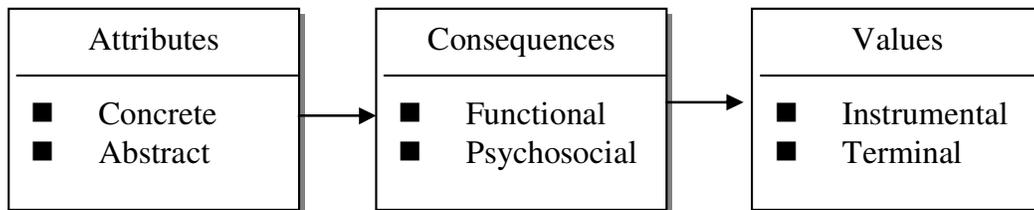
Means-end chains

Means-end chain (MEC) theory facilitates the understanding of the consumer's choice and how consumers link the attributes of products with particular consequences as well as how these consequences satisfy their personal values. Olson and Reynolds (2001) propose a comprehensive history of the MEC approach which focuses on the content and structure of consumers' knowledge involving three key concepts, namely, product attributes, consequences, and values where the theory gives insights into the buying motives and links these motives to the buying behavior (Gutman, 1982; Grunert and Grunert, 1995). Meanwhile, the concepts indicate that consumers perceive that relevant product attributes lead to consequences and further lead to certain values. Figure 1 shows the process of the model.

In MEC theory, product attributes are a means through which consumers obtain valued ends. Indeed, consumers choose products that give rise to particular consequences including benefits of product-use to achieve desired

Table 1. A typology of consumer value.

| Consumer value | | Extrinsic | Intrinsic |
|----------------|----------|-----------------------------------------------|-------------------------------------------|
| Self-oriented | Active | Efficiency (Output/Input, Convenience) | Play (Fun) |
| | Reactive | Excellence (Quality) | Aesthetics (Beauty) |
| Other-oriented | Active | Status (Success, Impression, Management) | Ethics (Justice, Virtue, Morality) |
| | Reactive | Esteem (Reputation, Materialism, Possessions) | Spirituality (Faith, Ecstasy, Sacredness) |

**Figure 1.** Means-end chain theory model (Olson, 1989).

values (Reynolds and Gutman, 1984). Three levels may be postulated, that is, the attributes, consequences, and values (ACV) may be hierarchically structured. For instance, attributes lead to consequences that lead to value satisfaction. The consequences may be direct, indirect, physiological, psychological or sociological. Meanwhile, consumers act so as to maximize the positive consequences and minimize the negative consequences (Gutman, 1982). At the attributes level, relatively tangible product characteristics are concrete attributes and product quality is an abstract attribute. Consequences can be the functional consequences of product use, psychological consequences, or the attracting of attention. At the highest levels of abstraction, consumers can represent a product in terms of the values obtained and achievement of basic needs during use, such as self-esteem or happiness (Walker et al., 1986; Pitts et al., 1991).

Laddering method and hierarchical value map

Interviewing consumers regarding the motivations behind the choices and interpreting these interviews in terms of the linkages between outcomes constitute the most usual research application of the MEC approach (Olson and Reynolds, 2001). Hinkle (1965) proposes the laddering method for interviewing consumers, which is by far the most important methodology for measuring the consumers' MEC. Laddering consists of a series of directed probes that initially refer to distinctions from perceived differences among specific brands of products or services (Gutman and Alden, 1985). Meanwhile, none of the subsequent higher-level elements are brand specific after the initial distinction based on contrasting brands. The results

are useful for developing an HVM that summarizes all interviews across consumers that represent ways of thinking with respect to the products or services (Reynolds and Gutman, 1988; Reynolds and Whitlark, 1995; Gengler and Reynolds, 1995).

The hierarchical value map (HVM) is without a doubt the most popular method used in the analysis of laddering data. Laddering by interview is a qualitative interviewing technique and follows a three-stage process (Reynolds and Gutman, 1988; Claeys, Swinnen and Abeele, 1995). The process begins by first performing a content analysis which leads to the construction of an implication matrix. This matrix represents the numbers of direct/indirect relationships among the ACV. The second step consists of the construction of a hierarchical value map (HVM), which presents a graphical representation of a set of MEC as associations across levels of a cognitive structure map. The HVM has the advantage of providing a well-organized summary of the information derived in the interviews. The HVM consists of nodes and lines which connect these nodes. Consumers are continuously probed with certain questions like "Why is that important to you?" which will force the subject up the ladder of abstraction. A sequence of concepts that serves as the results dominates the ladders. The third step has to do with categorizing the concepts into a smaller number of categories and the chains are pathways from one attribute to one value, which well reflect the means-end process for a large number of consumers. The chains between the concepts in the implication matrix are represented in order to construct the HVM. The attributes, consequences, and values form chains that are included in a HVM, which in turn depicts the cognitive or motivational decision structure of the consumer (Grunert and Grunert, 1995). These dominant MEC are resolved

by comparing all the chains in the HVM.

Numerous studies show that MEC is suitable for a wide range of marketing applications (Newel and Simon, 1972; Howard, 1977; Gutman, 1982; Olson and Thomas, 1983; Young and Feigin, 1975). In the early development stage, MEC is useful for explaining the derivative meanings of products and then later on in the segmentation, positioning, and testing of products (Claeys et al., 1995). Meanwhile, the predominant approach followed in the marketing literature for analyzing perceptions of self-relevance is MEC analysis (Thompson, 1997). van Trijp and Steenkamp (1998) apply MEC to new food design and find that new foods and their associated production technologies should not in themselves be seen as the goal or end of the design process, but rather as a means of fulfilling needs, thereby facilitating the achievement of consumers' values and goals. Therefore, marketing people could plan a marketing strategy by analyzing the MEC model to link the product or service with consumer value.

METHODS

Sample and data collection

This study combines qualitative (means-end chain analysis) and quantitative research methods to develop a consumer hierarchical value map (HVM) in healthcare service industry. Indeed, by applying qualitative dominates quantitative methods in order to understand how consumers transform service attributes into individual consumer's value. The study involves conducting the consumer categorization processes and performing second-order confirmatory factor analysis (SCFA) to test the goodness-of-fit of the consumer value model and analyze the relationships between consumer value and patient satisfaction. Then, hard laddering is applied to collect data in order to construct a hierarchical value map.

The data collection process includes two stages: the survey to test the goodness-of-fit of the consumer value model and the interviews to develop the healthcare consumers' hierarchical value map (HVM). The convenient and snowball sampling procedures, where the snowball sampling relies on referrals from initial subjects to generate additional subjects, are applied to consumers from six hospitals - 2 national university medical centers and 4 private regional hospitals in Taiwan - which had patients that were willing to complete questionnaires approximately 50 min. The respondents were familiar with hospitals as a result of a previous stay/visit or through knowing friends/relatives who had stayed in hospital before. In order to minimize bias due to the survey instruments, a pilot test was conducted. A total of 700 questionnaires were delivered and 504 questionnaires were completed, representing a 72% response rate in the initial survey. Based on the results of the survey, the researchers selected 50 respondents who had volunteered to complete the interviews. The interviews consisted of reading a series of questions aloud and recording the participants' responses. All of the respondents were asked if they agreed to participate in the interview several weeks later and data were collected to contact those who agreed. Table 2 summarizes the demographic characteristics of the respondents participating in the interviews.

The data collection methods consisted of the audio recording of individual interviews, as well as notes recorded in a journal by researchers both during and after the interviews. Each interview lasted approximately 50 min and the questions addressed in some detail the issues of consumer value and satisfaction. In order to ensure the generalization of the categories of the researcher's

findings, a study on the "truth value"- its applicability, its consistency and its neutrality - was constructed by reflecting on the assumptions adopted (Reid et al. 1995). The assumptions involved confirmability, credibility, transferability and dependability. The details may be described as follows:

- (1) Confirmability (objectivity): Search for bias and make it visible for inspection.
- (2) Credibility (internal validity): Establish credibility through multiple actions and allow participants to validate it as an accurate and truthful representation of the study's reality.
- (3) Transferability (external validity): Provide relevant and rich descriptors of a wide range of information.
- (4) Dependability (reliability): Establish credibility by gathering data that represent a variety of situations.

This study also adopted the following four steps to construct a high-quality consumers' HVM where an example of a HVM is shown in Figure 3:

- (1) Identify consumer values: Ask consumers questions in order to understand their thoughts regarding value.
- (2) Compare each value that is obtained from the consumers' subjective perceptions with an objective: Develop a hierarchical consumer value map to understand every competition improvement. Meanwhile, compare every value by the consumer's view.
- (3) Identify design objectives: According to every goal, design and join the goals progressively from bottom to top such as from attribute, consequence to value in Figure 3.
- (4) Develop the relationship network (Linkages in three levels of A-C-V): Pay close attention to the impact of the specific value to the consumer of every design characteristic. Meanwhile, join the step-by-step goal information to develop the relationship goal.

Significant relationships were found between the consumers' basic demands and expectations of service quality. There were more females (58%) than males (42%) and their ages ranged from 21 - 65 years old with an average age of 45. In terms of education level, 52% of the respondents held bachelor's degrees. Besides obtaining basic descriptive information, a series of questions was asked to explore the current consumer values for the healthcare service construct and measure items from the consumers' perception [how do you do this? Illustrate in Figure/diagram]. Reynolds and Gutman (1988) pointed out that when the sample size is between 30 and 50, the correlation may be discovered through HVM.

To ensure the reliability of classifying the consumers' MEC, in further research it is essential to include a reliability test in any content analysis (Krippendorf, 1980). Two judges are widely used for this purpose (Kolbe and Burnett, 1991). In this study, three judges categorized each questionnaire for testing the average interjudge agreement and reliability. Table 3 shows the average interjudge agreement and reliability of the three levels of abstraction of the study.

Kassarjian (1977) points out that the reliability of the content analysis is acceptable when the value is greater than 0.85. The average interjudge agreement of the current study is 0.86 and reliability is 0.95, thereby achieving the standard measures of agreement.

DATA ANALYSIS AND FINDINGS

Confirmatory factor analysis

Confirmatory factor analysis (CFA) is useful for testing the appropriateness of the full theoretical model. The

Table 2. Profile of respondents (N = 50).

| Profile | Number | Percent |
|------------------------------|--------|---------|
| Gender | | |
| Male | 21 | 42 |
| Female | 29 | 58 |
| Age | | |
| Under 30 | 6 | 12 |
| 31-40 | 10 | 20 |
| 41-50 | 22 | 44 |
| Over 50 | 12 | 24 |
| Education level | | |
| High school or less | 7 | 14 |
| College | 26 | 52 |
| Graduate (or above) | 17 | 34 |
| Monthly income (NT\$) | | |
| Under \$10,000 | 2 | 4 |
| \$10,000 to \$29,999 | 14 | 28 |
| \$30,000 to \$49,999 | 11 | 22 |
| Over 50,000 | 23 | 46 |
| Occupation | | |
| Business | 6 | 12 |
| Housekeepers | 2 | 4 |
| Banking/finance | 16 | 32 |
| Manufacturing | 8 | 16 |
| Service industry | 7 | 14 |
| Wholesale and retail | 11 | 22 |

Table 3. The average interjudge agreement and reliability of three levels of abstraction.

| | Attributes | Consequences | Values |
|------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Average interjudge agreement | $(0.89+0.85+0.86)/3$ = 0.87 | $(0.84+0.87+0.82)/3$ = 0.84 | $(0.9+0.89+0.89)/3$ = 0.89 |
| Reliability | $(3*0.87)/(1+2*0.87)$ = 0.95 | $(3*0.84)/(1+2*0.84)$ = 0.94 | $(3*0.89)/(1+2*0.89)$ = 0.96 |

current study utilizes Holbrook's eight-celled typology of consumer values that include efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality to explore consumer value in the healthcare industry. As such, the current study applies LISREL to perform second-order CFA to test the appropriateness of the model. Figure 2 shows the second-order confirmatory factor analysis model of consumer values. Composite reliability is useful for evaluating a set of observed variables regarding latent concepts and the degree of consistency in the internal consistency index. Table 4 shows the results of the composite reliability analysis of the consumer value evaluation model. The results reveal that the composite reliability of all constructs except for ethics

is greater than 0.5 (Bagozzi and Yi, 1988).

The second-order confirmatory factor analysis of overall consumer value model fit is shown in Tables 4 and 5. Most indexes of the absolute fit measures, incremental fit measures, and parsimonious fit measures possess construct validity. (An absolute fit index is used to directly evaluate how well the a priori theoretical model fits the sample data, an incremental fit index assesses the proportionate fit by comparing a target model with a more restricted, nested baseline model and a parsimonious fit measure is used to diagnose whether model fit has been achieved by over-fitting the data with too many coefficients (Hu and Bentler, 1999).) In Table 4, the RMSEA value is 0.074 close to the limit for acceptable

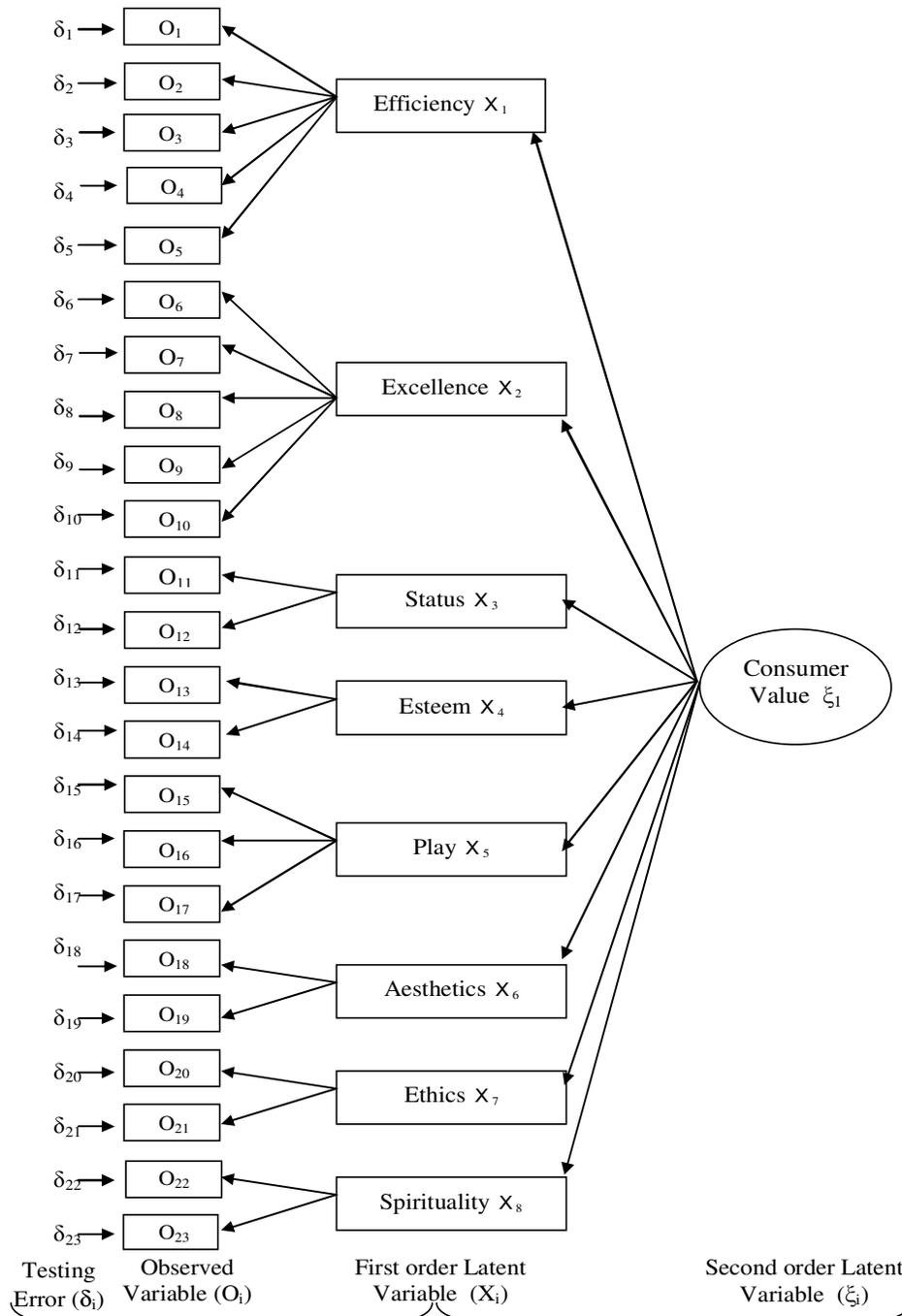


Figure 2. The second order confirmatory factor analysis model of consumer values.

acceptable fit of 0.08 (Browne and Cudeck, 1993). The AGFI value is 0.84 which is greater than 0.8 (Bagozzi and Yi, 1988). Overall, the fit indices suggest that the proposed model is a reasonable explanation of observed covariance among the given constructs. The statistical tests indicate a good overall fit of the study's hypothesized model. Meanwhile, the factor loadings λ are significant, which indicates that the variables of all constructs achieve convergent utility. Therefore, Holbrook's

(1994c, 1996, and 1999) eight types of consumer value not only sufficiently represent consumer value in the healthcare sector but are also useful for further qualitative analysis.

Analyzing content

Content analysis attempts to explore all of the elements

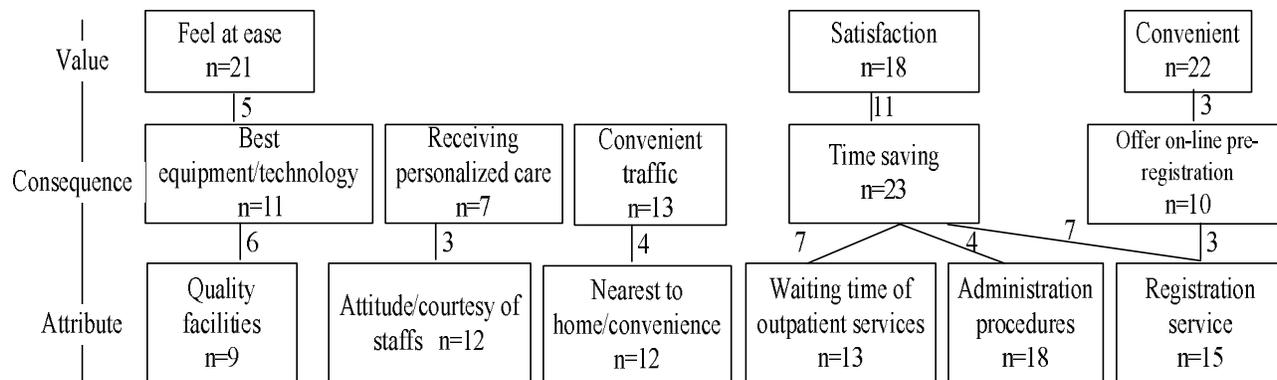


Figure 3. Hierarchical value map of efficiency.

Table 4. The overall consumer value model fit.

| Testing index | Criteria | Reference | Result |
|---------------------------------------------------------------------|------------------|-----------------------------|--------|
| Absolute fit measures | | | |
| χ^2 [do you really mean $p < .05$?] | p value > 0.05 | Carmines and Zeller (1979) | 0.00 |
| GFI (Goodness of fit) [do you mean R^2 ?] | > 0.8 | Bagozzi and Yi (1988) | 0.87 |
| SRMR (Single request / Multiple response) | < 0.8 | Hu and Bentler (1999) | 0.10 |
| AGFI (Adjusted goodness of fit) [do you mean adjusted R^2 ?] | > 0.8 | Bagozzi and Yi (1988) | 0.84 |
| RMSEA (Root mean square error of approximation) | 0.05 ~ 0.08 | Browne and Cudeck(1993) | 0.074 |
| Incremental fit measures | | | |
| [do you explain why an incremental fit is used? What does it mean?] | | | |
| NFI (Normed Fit Index) | > 0.90 | Hu and Bentler et al.(1999) | 0.93 |
| CFI (Comparative Fit Index) | > 0.95 | Bentler and Bonett (1980) | 0.95 |
| RFI (Relative Fit Index) | > 0.90 | Hu and Bentler (1999) | 0.92 |
| IFI (Incremental Fit Index) | > 0.90 | Hu and Bentler (1999) | 0.95 |
| Parsimonious Fit Measures | | | |
| [do you explain why an Incremental Fit is used? What does it mean?] | | | |
| PNFI (Parsimonious Normed Fit Index) | > 0.50 | Mulaik et al.(1989) | 0.82 |
| PGFI (Parsimonious Goodness of Fit Index) | > 0.50 | Mulaik et al.(1989) | 0.70 |

elicited by the laddering procedures. Examples for laddered questionnaires: (a) explain, in your own words, what is a definition of value; (b) what is your concern about the healthcare service? Why? (c) What is the specific value that hospital can offer? First, the process starts by recording entire sequences of ladders across all respondents on an individual coding form. Second, all of the responses are classified into three key concepts (attributes, consequences and values). From the results of the content analysis, interviews are conducted for 50 valid samples both singly as well as in depth and 3,329 items of data are collected including 1,252 attributes, 1,078 consequences, and 999 values (as shown in Table 6). Spirituality has fewer items than others. The average number of items is 66.58 which represents the attributes,

consequences and values (A-C-V) linked by the laddering technique. The HVM is built up by connecting all the chains and selecting the linkages whose associated weights are above the cut-off value of 3. Linkages whose associated weights are above the cut-off value give rise to strong relationships (Gurnert and Gurnert, 1995).

Means-end chain analysis

The hierarchical value map (HVM) of efficiency is shown in Figure 3, where n represents the number of respondents and the associated number on the line represents the associated number of linkages between the two hierarchies. The HVM (Figure 3) indicates that respondents

Table 5. Results of the second order confirmatory factor analysis of consumer value.

| | Variable | Maximum likelihood estimation parameter | | | Composite reliability |
|-----------|---------------------------------------------------------------------------|-----------------------------------------|----------|---------|-----------------------|
| | | λ | δ | t-value | |
| | Efficiency : X ₁ | | | | 0.85 |
| | O ₁ : Satisfied Hospitals' public facilities | 0.58*** | 0.67 | - | |
| | O ₂ : Simple and safe transaction process | 0.79*** | 0.38 | 12.09 | |
| | O ₃ : Numerous service | 0.69*** | 0.52 | 11.22 | |
| | O ₄ : Fast and convenient service process | 0.84*** | 0.30 | 12.50 | |
| | O ₅ : Easy searchable service information | 0.72*** | 0.48 | 11.47 | |
| | Excellence : X ₂ | | | | 0.80 |
| | O ₆ : Well equipped hospital facility | 0.48*** | 0.77 | - | |
| | O ₇ : Well trained medical professionals | 0.42*** | 0.94 | 4.66 | |
| | O ₈ : Medical professionals with warm- heartedness | 0.66*** | 0.56 | 9.44 | |
| | O ₉ : Reasonable charge | 0.92*** | 0.15 | 10.72 | |
| | O ₁₀ :Worth the money | 0.90*** | 0.19 | 10.67 | |
| | Status: X ₃ | | | | 0.81 |
| | O ₁₁ :Hospital's reputation | 0.96*** | 0.07 | - | |
| | O ₁₂ :Medical professionals' Reputation | 0.67*** | 0.55 | 7.37 | |
| 1st Order | Esteem : X ₄ | | | | 0.87 |
| | O ₁₃ :Endeavored medical professionals for solving problems | 0.78*** | 0.39 | - | |
| | O ₁₄ :Enthusiastic medical professionals for solving problems | 0.96*** | 0.08 | 16.12 | |
| | Play : X ₅ | | | | 0.79 |
| | O ₁₅ :Warm atmosphere | 0.38** | 0.86 | - | |
| | O ₁₆ :Fun treatment experience | 0.89*** | 0.21 | 8.02 | |
| | O ₁₇ :Enjoyable treatment experience | 0.90*** | 0.18 | 8.03 | |
| | Aesthetics: X ₆ | | | | 0.76 |
| | O ₁₈ :Attractive décor | 0.72*** | 0.49 | - | |
| | O ₁₉ :Comfortable treatment experience | 0.85*** | 0.28 | 15.90 | |
| | Ethics : X ₇ | | | | 0.32 |
| | O ₂₀ :Selecting outpatient services instead of patent medicine | 0.53*** | 0.72 | - | |
| | O ₂₁ :Refusing illegal medical professionals | 0.35** | 0.88 | 5.98 | |
| | Spirituality : X ₈ | | | | 0.88 |
| | O ₂₂ :Same hospital for outpatient services | 0.85*** | 0.28 | - | |
| | O ₂₃ :Same physician for outpatient services | 0.92*** | 0.16 | 7.94 | |
| 2nd Order | Consumer Value | | | | |
| | Efficiency | 0.69*** | 0.53 | 10.22 | |
| | Excellence | 0.63*** | 0.60 | 8.61 | |
| | Status | 0.41*** | 0.98 | 4.64 | |
| | Esteem | 0.70*** | 0.51 | 11.77 | |
| | Play | 0.87*** | 0.24 | 7.67 | |
| | Aesthetics | 0.96*** | 0.08 | 15.37 | |
| | Ethics | 0.31** | 0.90 | 3.27 | |
| | Spirituality | 0.31** | 0.91 | 5.25 | |

*p < 0.1, ** p < 0.05, *** p < 0.01.

Table 6. Eight types of consumer value item frequency.

| Frequency | Attributes | Consequences | Values | Total |
|--------------|------------|--------------|--------|-------|
| Efficiency | 167 | 140 | 127 | 434 |
| Excellence | 177 | 152 | 138 | 467 |
| Status | 183 | 145 | 135 | 463 |
| Esteem | 156 | 136 | 119 | 411 |
| Play | 148 | 130 | 124 | 402 |
| Aesthetics | 152 | 132 | 128 | 412 |
| Ethics | 147 | 125 | 118 | 390 |
| Spirituality | 123 | 118 | 110 | 351 |
| Total | 1252 | 1078 | 999 | 3329 |

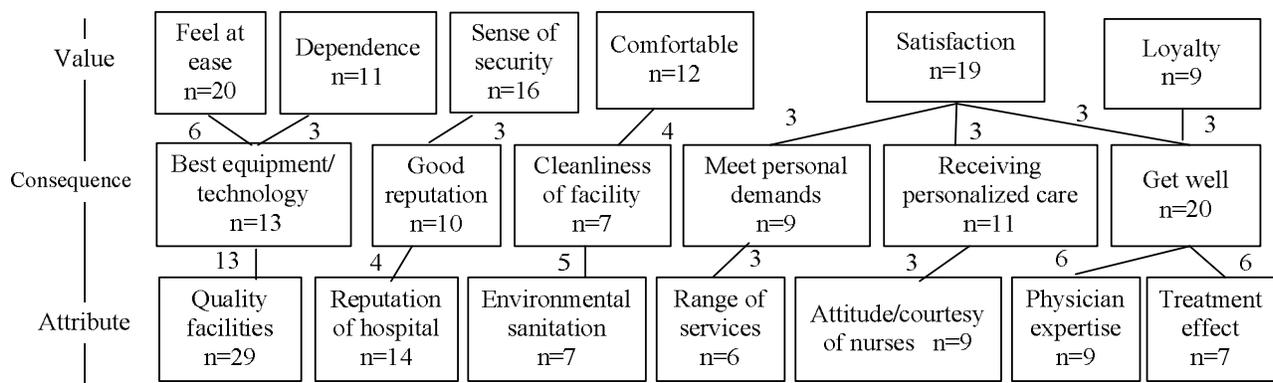


Figure 4. Hierarchical value map of excellence.

most often observe a sense of administrative procedures, time saving, and convenience

Specifically, time saving is the most important issue in healthcare between the linkages of attributes and consequences. The key attributes that lead to the time saving are the consequences of waiting time for outpatient services, service at registration, and administrative procedures. The key consequence that leads to the satisfaction of values is thus time saving. Waiting time in relation to outpatient services and registration services are helpful for saving the consumer time and further achieving higher satisfaction. In addition, the consequence that leads to feeling at ease is the best equipment/technology. Moreover, the consequence that leads to convenience is offering on-line pre-registration. The dominant perception by consumers is that registration service → offer on-line pre-registration → convenience. Two other important perceptions by consumers are that, first quality facilities → best equipment/technology → feeling at ease. The other is that waiting time for outpatient services, administration procedures, and registration service → time saving → satisfaction. The HVM (Figure 3) implies that, for healthcare services, subjects are most concerned with

the service being convenient, feeling at ease, and obtaining satisfaction from an efficiency perspective. Convenience is associated in the minds of consumers with the response of the hospitals' registration service. The hospitals' best equipment/technology results in the consumer feeling at ease. Furthermore, hospital managers should focus on reducing waiting, speeding up the administrative procedures and simplifying the registration service to achieve higher satisfaction.

Figure 4 represents the HVM of excellence. The respondents mentioned quality facilities, getting well, and feeling at ease most often. The key attributes that lead to getting well in relation to the consequences are the physician's expertise and the treatment effect. The key consequences that lead to feeling at ease, in terms of consumer values, are the best equipment/technology. The best equipment/technology also leads to a relation of dependence (which means subordination to individual consumer or something consumer needed or greatly desired.). Quality facilities are helpful in understanding and improving the patients' condition. Eventually, consumers will feel at ease and will trust the hospital during the medical care process. The other important value is satisfaction. The key consequences that lead to

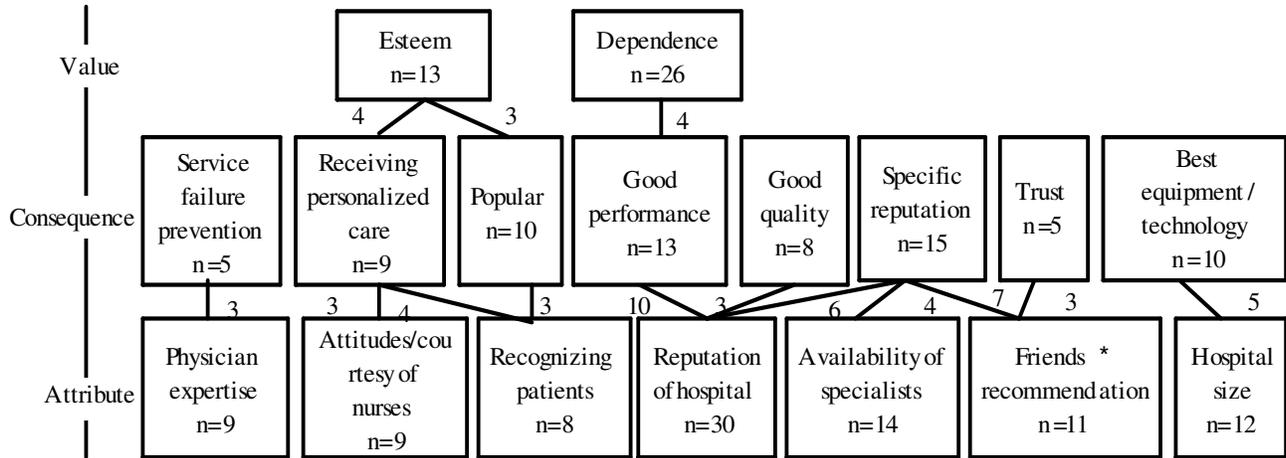


Figure 5. Hierarchical value map of status.

satisfaction include meeting personal demands, receiving personalized care, and getting well.

Furthermore, getting well in relation to these consequences also leads to loyalty. The dominant perceptual orientation is that the quality of the facilities → the best equipment/technology → feeling at ease. Other important consumer perceptions include the physician's expertise and treatment effect → getting well → satisfaction; attitude/courtesy of nurses → providing more than the patient needs → satisfaction; and range of service → meeting patient demands → satisfaction. The HVM (Figure 4) implies that consumers believe that the physician's expertise will effect an improvement in the patients' condition (getting well) and will further affect the consumers' satisfaction with healthcare and willingness to return.

Figure 5 represents the HVM in the case of status. Respondents most often observe a sense of the reputation of the hospital, the specific reputation and dependence. Specifically, the reputation of the hospital is the most important healthcare attribute to the consumer. The key attributes that lead to a specific reputation for healthcare include the reputation of the hospital, the availability of specialists and friends' recommendations. The key consequences that lead to dependence are good performance. These results show that the hospital's reputation is one of the most important factors for choosing hospitals. Furthermore, a recommendation is the other important attribute of healthcare. On the other hand, the key consequence that leads to esteem is receiving personalized care. Therefore, the hospital needs to respect its consumers and they will feel esteem. Meanwhile, the hospital's good reputation can reduce the consumers' uncertainty and further result in trust. The dominant consumer perception is that the reputation of the hospital → good performance → dependence. Another important consumer perception is that the reputation of the hospital and the availability of specialists

and friends' recommendations → specific reputation. According to the status of the A-C-V linkage, consumers care about the hospital's reputation and friends' recommendations. Therefore, word of mouth is the important issue for the hospital's reputation. Furthermore, the interaction between medical professionals and consumers during the treatment process is helpful for the consumers' feeling of respect. Eventually, achieving respect and a good image further improve status value.

Figure 6 represents the HVM in the case of esteem. Respondents most often observe a sense of attitude/courtesy/'bedside manner' on the part of nurses, during proper care, and when receiving personalized care, which leads to the value of self-esteem. To be specific, the attitude/courtesy/'bedside manner' of nurses is the most important issue faced by healthcare institutions when it comes to attracting and retaining consumers. The key attributes that lead to the proper care of the consequences are the attitude/courtesy of nurses and medical service procedures. Furthermore, the key consequences that lead to receiving personalized care include four attributes, namely, the attitude/courtesy of nurses, courtesy of staff, the complaint service, and professional ethics. Because medical care involves very close interaction with consumers during medical service procedures, the consumers' feeling of respect (providing what they need) mainly comes from the attitude/courtesy/'bedside manner' of the staff or nurses attending to them. Not only does the attitude/courtesy/'bedside manner' of the staff or nurses determine not only whether a patient feels it is worth going to that hospital or not, but it also directly affects how the consumer perceives proper care. In terms of the link between consequences and values, the linkage between receiving personalized care and self-esteem is the most significant, which shows that respecting the consumers' feelings during the medical treatment process can give them greater self-esteem. According to the HVM of esteem, consumers attach great

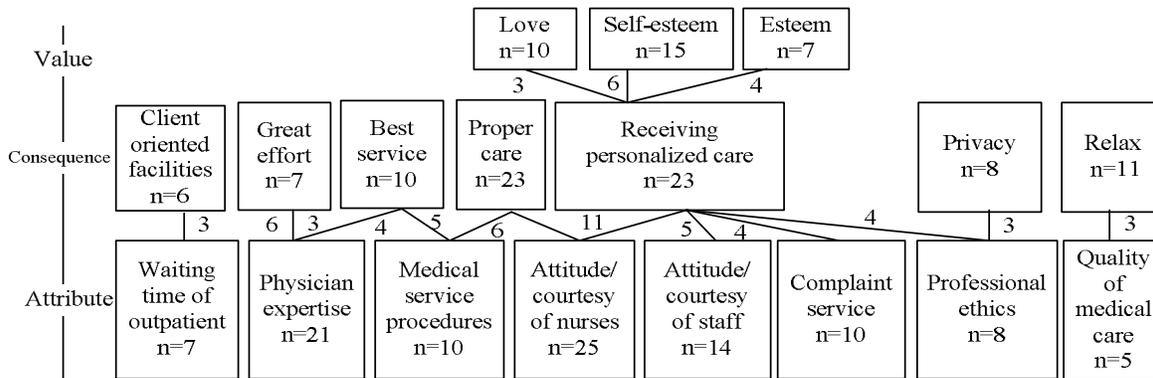


Figure 6. Hierarchical value map of esteem.

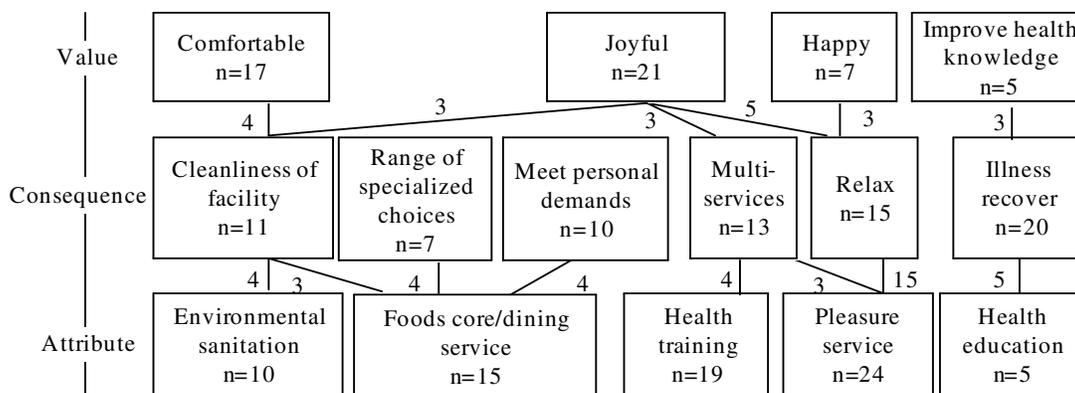


Figure 7. Hierarchical value map of play.

importance to the attitude/courtesy /'bedside manner' of nurses. Therefore, nurses have a responsibility to provide direct hands-on care to patients and to communicate with patients with a good attitude by providing the necessary medical care information. Eventually, the nurses' attitudes will improve the consumers' esteem. Meanwhile, the attitude/courtesy/'bedside manner' of staff in attending to consumers, handling the complaint service, and professional ethics are important attributes that influence consumer perceptions of medical treatment procedures.

Figure 7 represents the HVM in terms of play. The respondents most often refer to the pleasant service, recovery from illness, and feeling joyful. The pleasant service attribute is associated not only with relaxing, but also with multi-service consequences. Two key attributes, namely, the pleasant service and health training, directly lead to the consequence of multi-services. To be specific, the food court/dining service is associated with the cleanliness of the facility, the range of specialized choices, and meeting personal demands. The cleanliness of the facility is associated with comfort. Therefore, if the hospital provides food court/dining services it can make the consumer comfortable. On the other hand, the

consequences of the relaxed availability of multi-services and the cleanliness of the facility are associated with being joyful. Consumers pay attention to the provision of pleasant services in hospitals such as commercial streets, friendship rooms, and worship rooms where they can relax and experience some spiritual solace. In addition, the environmental sanitation and food court/dining service attributes lead to the cleanliness of the facility. The consequence of the cleanliness of the facility is associated with the value of comfort. The dominant consumer perception is pleasant service → multiple services and relaxation → feeling joyful. The important consumer perception includes environmental sanitation and foods court/dining service → cleanliness of facility → comfort. The HVM (Figure 7) implies that if they can relax, the consumers will be joyful and happy. Because consumer health training is very important in medical treatment procedures, the provision of healthcare education will not only improve consumers' healthcare knowledge, but will also help take care of their health.

Figure 8 represents the HVM for aesthetics. The respondents most often referred to appearance and décor, the cleanliness of the facility, and the comfort of

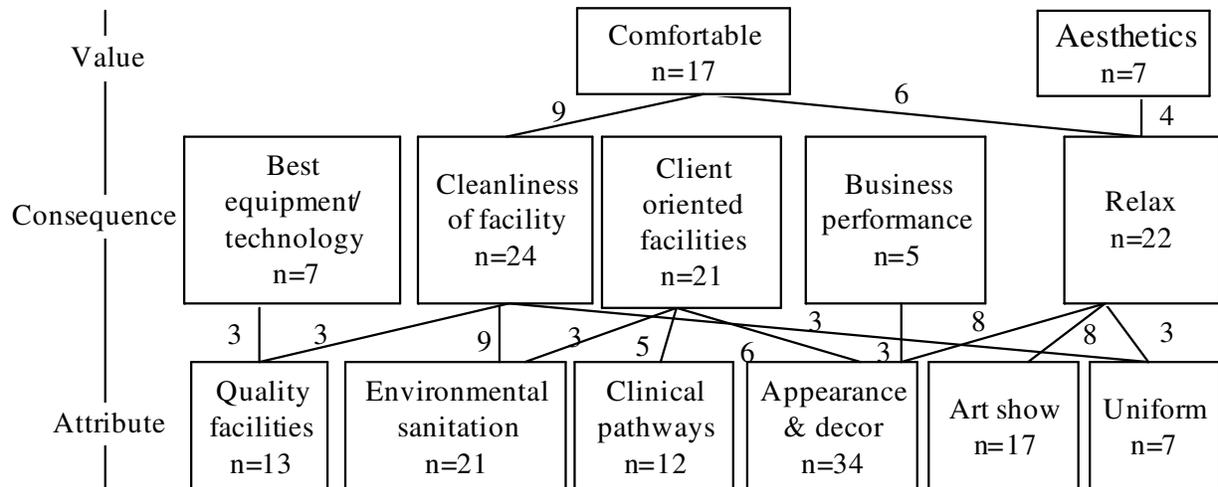


Figure 8. Hierarchical value map of aesthetics.

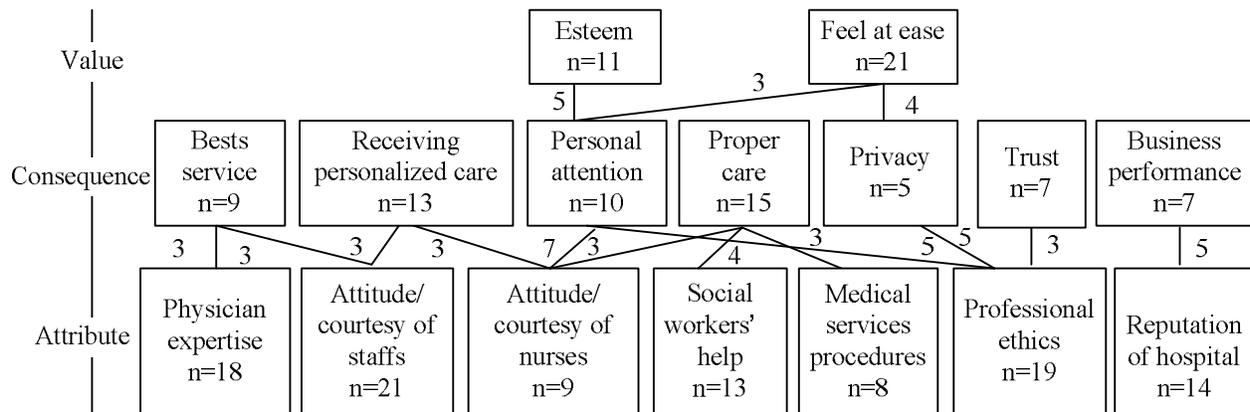


Figure 9. Hierarchical value map of ethics.

the surroundings. Specifically, appearance and décor constituted the most important attribute in the case of healthcare. The key attributes that lead to the cleanliness of the facility were the quality of the facilities, the environmental sanitation, and uniforms. Because the environmental sanitation of the hospital is closely related to aesthetics and consumers' health, the consumers paid a lot of attention to the environmental sanitation. The other key attributes that caused them to relax included the appearance and décor, as well as art on display, and uniforms. The results reveal that both appearance and décor as well as art shows can relax consumers during the medical treatment process. The key consequences that lead to feeling comfortable include the cleanliness of facility and the relaxed surroundings. Furthermore, relaxation also leads to aesthetics. The dominant consumer perception is appearance and décor → relaxation → feeling comfortable. Other important consumer perceptions regard how the quality of the facility,

environmental sanitation, and uniforms → best equipment/technology → feeling comfortable; and appearance and décor, art shows, and uniforms → relaxation → aesthetics. The HVM (Figure 8) implies that consumers will feel comfortable with a client-oriented facility as well as relaxed services.

According to the results of this study, consumers feel comfortable with the cleanliness of the facility and the relaxed surroundings; and the art on display and uniforms can relax consumers during medical treatment procedures. Meanwhile, appearance and décor have a strong relationship with relaxation, business performance, and client-oriented facilities. Due to the multiple-types of consumers, hospitals should consider the consumers' physiological and psychological needs in order to improve the aesthetics of health institutions. Figure 9 represents the HVM for ethics. The respondents most often observe a sense of the attitude/courtesy/'bedside manner' of staff, proper care, and feeling at ease.

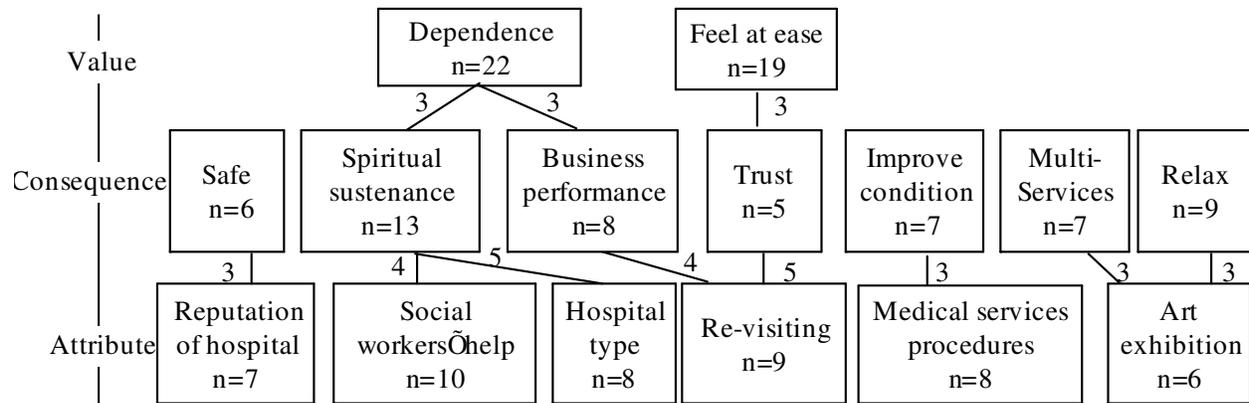


Figure 10. Hierarchical value map of spirituality.

Specifically, the attitude/courtesy/'bedside manner' of staff is the most important issue in healthcare institutions. This result is similar to that of the HVM for esteem (Figure 6). When hospital staff, including nursing staff, displays appropriate attitudes and emotions, they do so in the process of delivering services intended for the hospital's consumers. The managers of healthcare institutions must be more concerned with their hospital staff, since the hospitals' consumers will consider them to be a primary determinant of service quality by placing a greater emphasis on patient care.

The dominant consumer perception is attitude/courtesy/'bedside manner' of staff → personal attention → feeling at ease and esteem. The other important perceptual orientation includes professional ethics → personal attention, privacy, and trust → esteem. Consumers seriously care about equal treatment and privacy during the medical treatment process. Therefore, the medical professionals' consistent attitude and good work ethics can avoid potential medical disputes. Because the medical staffs' attitude and work ethics are important attributes influencing the ethics' value, hospitals should periodically enhance their medical professionals' skills in addition to work ethics. Eventually, consumers will feel at ease and feel a sense of esteem and will further avoid potential medical disputes as well as form ethical values during the medical treatment process.

Figure 10 represents the HVM of spirituality. The respondents most often refer to the social workers' help, spiritual sustenance, feeling at ease, and dependence. The dominant consumer perception is the social workers' help and hospital type → spiritual sustenance → dependence. The other important consumer perceptions include revisiting → trust → feeling at ease and revisiting → business performance → dependence. Consumers will return to visit the health institution because of the business-like performance and trustworthy service. According to the analysis of eight types of consumer HVMs, a larger number of linkages between two hierarchies show

that consumers respect these most and healthcare managers can further focus on the influencing factors in order to capture the market.

CONCLUSIONS AND IMPLICATIONS

Healthcare service is a specialized field of service, with the consumers' involvement being particularly important during the medical treatment process. In the past, the medical industry highlighted attributes of the treatment experience or consequences of professional service to fulfill the consumers' needs. In general, the more satisfied consumers usually maintained higher consumer loyalty. Reichheld and Sasser (1990) suggested that high consumer loyalty could ensure a stable future cash flow, thus yielding higher average profits. However, consumer loyalty resulted in little understanding of the consumers' ultimate goals. In other words, in survey studies performed based on MEC analyses, such as this paper, the application of qualitative research could reveal more detailed findings from the data (Stewart and Shamdasani, 1990). Therefore, the application of MEC could make manifest the abstract linkages among personal values, the consequences of consuming, and concrete attributes.

The current study provides in-depth profiles of eight types of consumer HVM models of the healthcare industry in Taiwan which reveals a need to shift the main focus from being provider-oriented to being patient-oriented. Healthcare managers are the primary determinants of service quality, and when this is concerned with consumer value, the emphasis is on superior patient service. A major contribution of the current study is that eight types of consumer HVMs model the domain of consumer value in the healthcare service. The study's HVMs not only provide meaningful implications for consumer value, but also recognize what consumers both need and want. However, the modified analysis classifies five of these values in the HVMs (feeling at ease, satisfaction, being comfortable and esteem) as representing

(feeling at ease, satisfaction, being comfortable, and esteem) as representing areas as important as the consumers' care. Consumers are willing to pay more for receiving personalized care and waiting time saved. To capitalize on the willingness-to-pay, the managers of healthcare institutions should focus on the quality of care available in terms of the administrative procedures and the attitude/courtesy/'bedside manner' of the nurses. To be successful, the objective consumers should perceive significantly higher quality from the health institutions. In particular, focusing on distinct competencies (e.g. the physician's expertise) and creating a significant competitive edge both enhance the consumers' perceptions of quality. The managers of healthcare institutions must be more aggressive in seeking to understand the consumers' expectations and needs based on the perceptions of their consumers. Healthcare institutions should consistently improve the intrinsic value of the services received by patients.

Healthcare staffs are usually bound to exhibit appropriate attitudes and emotions in the initial processes of delivering service to their patients. The healthcare industry not only needs to encourage employees to focus on the needs of the patients, but also to provide a greater patient focus in order to improve the services received by patients. These results conform to those of previous studies, which propose that the future of the healthcare system will be patient-focused rather than provider-focused (Herzlinger, 1998; Lee, 2007).

Furthermore, the healthcare industry should address consumers' perceptions of sacrifice regarding the facility, such as the waiting time for outpatient services. Over the past two decades, consumers who were not very sensitive to the attitude of staff or the pleasantness of the service indicated that this provided a unified case for services that met the consumers' social and emotional needs as well as their medical needs. Healthcare institutions can deeply understand the content value of different consumer types during the marketing planning process. The eight types of consumer HVMS are based on the assumption that consumers tend to think about healthcare service in terms of their own value [what is 'own value']. By observing the consequence/value associations of consumers, healthcare managers can capture consumer surplus at different levels by providing for the real needs of consumers and further improve their loyalty and willingness to return. Furthermore, the HVMS can help with the evaluation of current services to see whether or not they can fulfill the consumers' needs and produce value.

By recognizing the value to each consumer, healthcare institutions can transform their operating direction and resources in order to create consumer value. This is all about selecting value, providing value, and delivering value. This study measures the value of consumers in developing a Consumer Hierarchical Value Map (CHVM), and confirms it as one useful method. Healthcare

institutions can increase their value by investing in their consumer relations according to the CHVM. However, few studies focus on the development of a value model in the healthcare institutions. The current study not only successfully enhances the quality of the empirical results and provides guidance to healthcare managers as to of consumer value, but also confirms Holbrook's (1994c, 1996, 1999) eight types of consumer value.

The limitation of the study is the potential self-selection bias in the sample, caused by using only hospitals that were willing to complete the questionnaires. Because most consumers of healthcare institutions are patients or their family members, it will be difficult for a longer interview unless they are willing to complete the questionnaires.

ACKNOWLEDGEMENT

The authors would like to thank the National Science Council of the Republic of China, Taiwan, for the financial support under Contract No. NSC 95-2221-E-327-001. The authors are also most grateful for the constructive suggestions of the anonymous reviewers all of which has led to the making of several corrections and suggestions that have greatly aided us in the presentation of this paper.

REFERENCES

- Bagozzi RP, Yi Y (1988). "On the evaluation of structural equation models". *Acad. Mark. Sci.*, 16(4): 74-94.
- Bentler PM, Bonett DG (1980). "Significance Tests and Goodness of Fit in the Analysis of Covariance Structure". *Psychol. Bull.*, 88(3): 588-606.
- Browne MW, Cudeck R (1993). *Alternative Ways of Assessing Model Fit*, in *Testing Structural Equation Models*, (eds.) K. Bollen, J. Long. Newbury Park, CA: Sage.
- Carmines EG, Zeller RA (1979). *Reliability and validity assessment*, Newbury Park, CA: Sage.
- Claeys C, Swinnen A, Abeele PV (1995). "Consumers' means-end chains for "think" and "feel" products". *Int. J. Res. Mark.*, 12: 193-208.
- Gengler CE, Reynolds TJ (1995). "Consumer understanding and advertising strategy: Analysis and strategic translation of laddering data". *J. Advert. Res.*, 35: 19-33.
- Gooding SKS (1995). "Quality, Sacrifice and Value in Hospital Choice". *J. Health Care Mark.*, 15(4): 24-31.
- Grunert KG, Grunert SC (1995). "Measuring subjective meaning structures by the laddering method: Theoretical considerations and methodological problems". *Int. J. Res. Mark.*, 12(3): 209-225.
- Gutman J (1982). "A means-end chain model based on consumer categorization processes". *J. Mark.*, 46: 60-72.
- Gutman J, Alden SD (1985). "Adolescents' cognitive structures of retail stores and fashion consumption: A means-end chain analysis of quality", in Jacoby, J. and Olson, J. (eds), *Perceived quality*, Lexington Books, Lexington, MA. pp. 99-114.
- Hauser JR, Urban GL (1986). "The value priority hypotheses for consumer budget plans". *J. Consum. Res.*, 12(4): 446-462.
- Hawkes VA (2000). *The Heart of the Matter: The Challenge of Consumer Lifetime Value*. Consumer Relationship Management Forum Resources.
- Herzlinger RE (1998). "The Managerial Revolution in the U.S. Health

- Care Sector: Lessons from the U.S. Economy", *Health Care Manage. Rev.*, 23(3): 19-29.
- Heskett JL, Sasser WE Jr, Schlesinger LA (1997). *The Service Profit Chain: How Leading Companies Link Profit to Loyalty, Satisfaction, and Value*: The Free Press, New York, NY.
- Hilliard AL (1950). *The Forms of Value: The Extension of Hedonistic Axiology*. New York: Columbia University Press.
- Hinkle D (1965). The change of personal constructs from the viewpoint of a theory of construct implications. Unpublished PhD Thesis. Ohio State University.
- Holbrook MB (1994). "The Nature of Consumer Value: An Axiology of Service in the Consumption Experience", *Service Quality: New Direction in Theory and Practice*, Roland T. Rust and Richard L. Oliver, eds. Thousand Oaks, CA: Sage Publications. pp. 21-71.
- Holbrook MB (1994c). The Nature of Consumer Value: An Axiology of Services in the Consumption Experience, in R. T. Rust and R. L. Oliver (eds) *Service Quality: New Directions in Theory and Practice*, Thousand Oaks, CA: Sage Publications, pp. 21-71.
- Holbrook MB (1996). "Consumer value-A framework for analysis and research", in Kim P. Coffman and John G. Lynch, Jr. (eds.) *Advances in Consumer Research*, 23, Provo, UT: Association for Consumer Research. pp. 31-57.
- Holbrook MB (1999). Introduction to Consumer Value, In *Consumer value: A Framework for Analysis and Research*, edited by Morris B. Holbrook, London: Routledge. pp.1-28.
- Holbrook MB (2006). "Consumption Experience, Consumer Value, and Subjective Personal Introspection: An Illustrative Photographic Essay". *J. Bus. Res.*, 59: 714-725.
- Howard JA (1977). "Consumer Behavior: Application and Theory", McGraw-Hill, New York.
- Hu L, Bentler PM (1999). "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria vs. New Alternatives", *Structural Equation Modeling*, 6(1): 1-55.
- Kassarjian H (1977). "Content Analysis in Consumer Research", *J. Consum. Res.*, 4(1): 8-18.
- Keeney RL (2001). "Modeling Values for Telecommunications Management", *IEEE Transact. Eng. Manage.*, 48 (3): 370-379.
- Kolbe RH, Burnett MS (1991). "Content-analysis Research: An Examination of Applications with Directives for Improving Research Reliability and Objectivity". *J. Consum. Res.*, 18: 243-250.
- Kotler P (1996). *Marketing Management---Analysis, Planning, Implementation, and Control*, 9th ed. N. J.: Prentice Hall International.
- Krippendorff K (1980). *Content Analysis: An Introduction to its Methodology*, Beverly Hills, CA: Sage.
- Lee WI, Tien-Hsiang C, Pei-Ju C (2007). "The Relationship between Quality of Healthcare Service and Consumer Satisfaction - An Example of Hospitals in Taiwan". *J. Chinese Instit. Ind. Eng.*, 24(1): 81-95.
- Mulaik SA, James LR, Van Alstine J, Bennett N, Lind S, Stilwell CD (1989). "Evaluation of Goodness-of-fit Indices for Structural Equations Models." *Psychol. Bull.*, 105: 430-445.
- Newell A, Simon HA (1972). *Human Problem Solving*, Prentice Hall, Englewood Cliffs, NJ .
- Olson JC, Thomas JR (1983). "Understanding Consumers' Cognitive Structures: Implications for Marketing Strategy", In: Percy, L and Woodside, A.G. (eds), *Advertising and Consumer Psychology*, Lexington Books, Lexington, MA. pp. 77 - 90.
- Olson JC (1989). "Theoretical Foundations of Means-End Chains", *Werbeforschung and Praxis Folge. 5*: 174-178.
- Olson JC, Reynolds TJ (2001). "The Means-End Approach to Understanding Consumer Decision Making", *Understanding Consumer Decision Making: The Means-End Approach to Marketing and Advertising Strategy*, Lawrence Earlbaum Associates, Mahwah, New Jersey. pp.3 - 20 .
- Pan FC, Chen CS (2004). "Enhancing Competitive Advantage of Hospitals through Linguistics Evaluation on Consumer Perceived Value", *J. Am. Acad. Bus.*, September. pp. 481-485.
- Pitts RE, Wong JK, Whalen DJ (1991). "Consumers' Evaluative Structures in Two Ethical Situations: A Means-End Approach". *J. Bus. Res.*, 22: 119-130.
- Reichheld F, Jr Sasser WE (1990). "Zero Defections: Quality Comes to Services." *Harv. Bus. Rev.*, September-October, pp. 105-111.
- Reichheld FF (1994). "Loyalty and the Renaissance of Marketing". *Mark. Manage.*, 2(4): 10-20.
- Reichheld FF, Markey RG Jr, Hopton C (2000). "The Loyalty Effect: The Relationship between Loyalty and Profits". *Eur. Bus. J.*, 12(3): 134-139.
- Reid DK, Robinson SJ, Bunsen TD (1995). "Empiricism and Beyond Expanding the Boundaries of Special Education", *Remedial and Special Education*. 16 (3): 131-141.
- Reynolds TJ, Gutman J (1984). "Advertising is Image Management", *J. Advert. Res.*, 24: 27-37.
- Reynolds TJ, Gutman J (1988). "Laddering Theory, Method, Analysis, and Interpretation", *J. Advert. Res.*, February/March, pp.11-31.
- Reynolds TJ, Whitlark DB (1995). "Applying Laddering Data to Communications Strategy and Advertising Practice". *J. Advert. Res.*, 35: 9-17.
- Stewart DW, Shamdasani PN (1990). "Focus Groups: Theory and Practice", Newbury Park. 20: 122-139.
- Thompson CJ (1997). "Interpreting Consumers: A Hermeneutical Framework for Deriving Marketing Insights from the Texts of Consumers' Consumption Stories". *J. Mark. Res.*, 34: 438-455.
- van Trijp HCM, Steenkamp JBEM (1998). "Consumer-oriented New Product Development: Principles and Practice. In W. M. F. Jongen, and M. T. G. Meulenberg (Eds.), *Innovation of Food Production Systems: Product Quality and Consumer Acceptance*. pp. 37-66.
- Walker BA, Celsi R, Olson JC (1986). "Exploring the Structural Characteristics of Consumers' Knowledge". *Adv. Consum. Res.*, 14: 17-21.
- Young S, Feigin B (1975). "Using the Benefit Chain for Improved Strategy Formulation." *J. Mark.*, 39: 72 - 74.