A Conceptual Framework of Programming the EMEC Model

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ABSTRACT

This research based on the extended means-end chain (EMEC) theory proposes a programming procedure for qualitative analyses as a conceptual structure of establishing information system. Through the illustrations of data collection and programming procedure reveal a new framework for analyzing the linkages of consumer value satisfaction and product attribute design. Such a framework provides businesses the programming logics to construct their database regarding the relationships of product design and value satisfaction. Researchers can infer the procedure of the extended MECs proposed in this study to analyze and assemble the logics of qualitative analyses for establishing the information system.

INTRODUCTION

In marketing field, qualitative analysis is conducted by either literal or face-to-face interviews, in order to gather and summarize consumers' consistent viewpoints (Gay and Airasian, 1999; Peck and Secker, 1999). Palmerino (1999) indicated that qualitative analysis could be considered as an analysis closer to the focus-group research. No matter using the so-called focus-group research or the other qualitative analyses, scholars should further classify and summarize the collected data to interpret certain circumstances. The most common used method to analyze these collected data is content analysis, because of its characteristics of analyzing data subjectively and systematically (Holsti, 1969). Lots of researchers used these characteristics to develop computer software for practical use. William Evans, a professor in the university of Alabama, listed 35 software associated with content analysis and also provided related soft wares for other qualitative analyses (bama.ua.edu/~wevans/content/csoftware/software_menu.html). Obviously,

researchers can emphasize on discovering the logics of qualitative analyses and provide their findings for contributing the development of information system, in order to enhance the analyzing abilities of information system and provide efficient operation information to business.

Owing to the lack of logic methodology in embodying qualitative theory, this study used quantitative analyses to analyze the qualitative information and construct the logic structure for qualitative theory. The researchers used means-end chains (MEC) methodology (a qualitative methodology) (Gutman, 1982) as an example and constructed its logic procedure. Such a logic procedure could help computer programmers for their information system designs, in order to establish effective information systems. In the dynamic and competitive environment, adopting appropriate information technologies and systems, business can benefit not only from reacting market situations efficiently but also from operating effectively.

THE PROGRAMMING PROCEDURE OF THE EXTENDED MEC

Traditional MEC methodology provides a theoretical conceptualization of the abstraction of consumers' product knowledge (Olson and Reynolds, 1983). The upper part of Figure 1 shows the traditional MEC model, which has three levels of abstraction (attributes, consequences and values), each divided into two categories. The attributes can be concrete (Bettman, 1986; Jacoby et al., 1976; Bettman and Park 1980) or abstract (Rosch, 1975; Rosch et al., 1976); the consequences can be the functional consequences of product use or psychological consequences; and the values can be either the terminal or instrumental values (Rokeach, 1973). In traditional MECs, marketers only can obtain what kinds of product attributes contribute to consumer's value satisfaction rather than more detailed information concerning how to design a product to fit consumer's needs. In fact, a product's attribute consists of a set of attribute levels (Green and Srinivasan, 1978). If marketers can further understand what attribute levels of a product's attribute are more desirable by consumers, it become easier for marketers to design their products with more precise information of consumers' needs. Thus, this research adopted the conceptual framework of the extended MEC (EMEC) theory to present the relationships between product design and value satisfaction shown as the bottom part of Figure 1.

The linkages of 'attribute level-attribute-benefit-value' (A_L-A-B-V) chains were used to substitute the traditional A-C-V linkages. Product attributes here were used as a medium, similar to consequence variables proposed in the traditional MEC. Benefits were employed in this study, because benefits indicated perceived positive consequences associated with product purchase and use, contributing to the analysis of consumer's value satisfaction (Ziethaml, 1988; Woodruff,

1997). Hence, the expanded EMECs can be considered as a more powerful means to design a product for satisfying consumers' expectations and value demands (Lin, 2003).

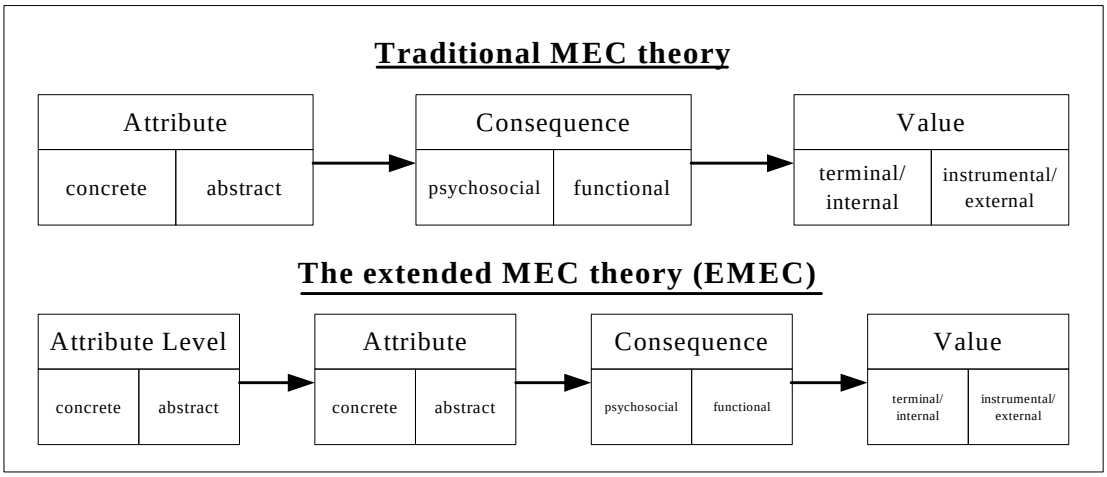

Figure 1: The comparison of traditional MEC and EMEC

Based on the A_L-A-B-V linkages, the procedure of conducting a logic structure for establishing the relational database between product design and value demand was illustrated in Figure 2. The procedure divided into three steps was demonstrated as follows:

Step 1: Identifying system variables

(1) Based on the secondary data collection, A_L variables of a given product can be identified and grouped into each belonging attribute (A) category.

(2) Through in-depth interviewing, product attributes (A) and consumer's benefits (B) can be collected and summarized.

(3) Using focus-group research and content analysis, the researchers will be able to identify attribute (A), and benefit (B) variables. A and B variables are decided by the mode of each variable category. In addition to A and B variables, 9 value variables are adopted directly from LOV inventory (Kahle, 1986).

(4) Confirming A_L, A, B, V variables and using these variables as intro-base for establishing information system.

Step 2: Processing

(1) Interviewing consumers to understand consumer's preferences of a particular product's attributes.

(2) Focusing on consumer's preference of the particular product's attributes and inquiring consumers related information about the A_L of a given product's attributes.

(3) Comprehending whether consumer's preferences of these attributes can obtain benefit consequent feelings, leading to his/her partial value satisfactions.

Step 3: Developing system function

(1) Calculating and recording the frequencies of A-B and B-V linkages separately; and sequentially, calculating and recording the mode of A_L variables.

(2) The cutoff value is decided either by percentile (Gengler and Reynolds, 1995) or using the distribution of the collected data.

(3) Choosing the A-B and B-V linkage frequencies, which are greater than the cutoff value and putting them into the hierarchical value map (HVM) developed by Reynolds and Gutman (1988).

(4) Obtaining a completely HVM.

(5) Depending on the results of the HVM to analyze the marketing implications, formulate product design strategies.

(6) Connecting with other related internal databases through marketing intelligence system to become an interference of product design strategies.

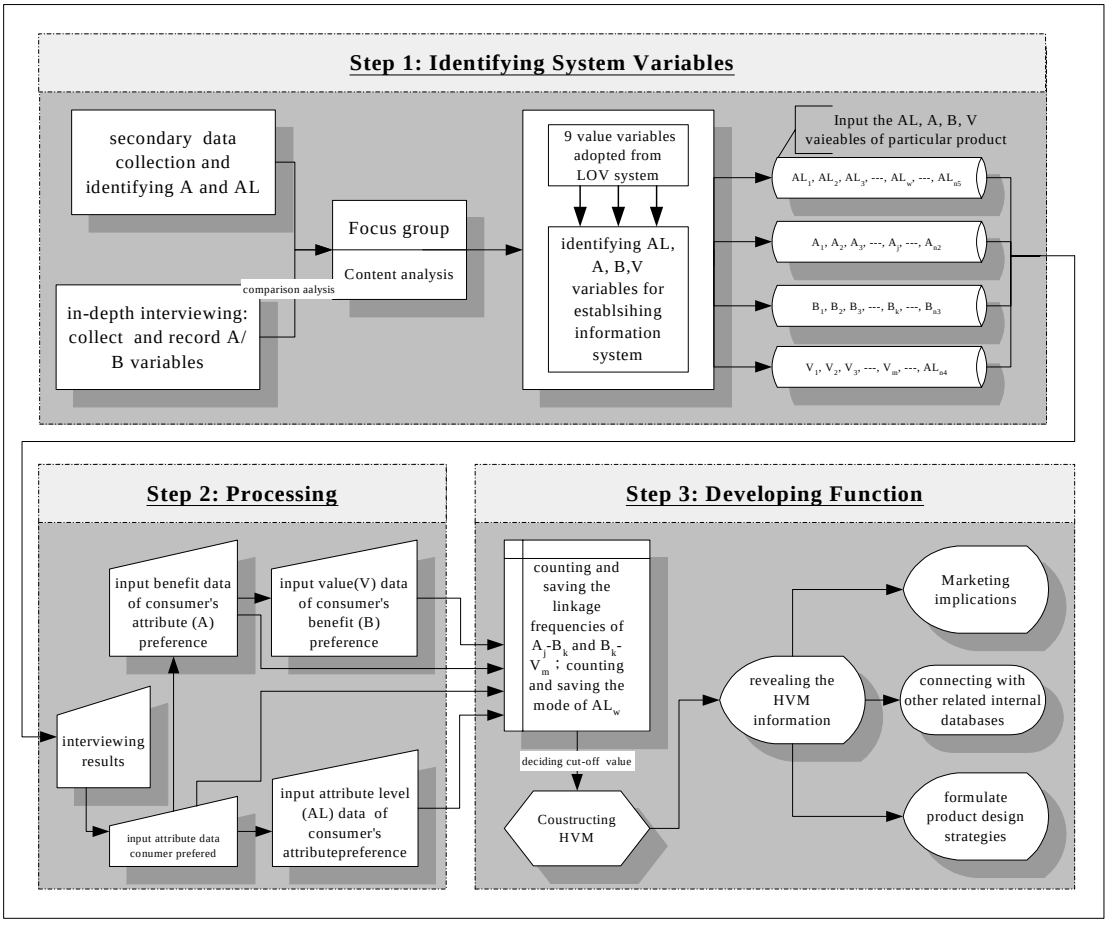

Figure 2: The conceptual procedure of the EMEC

EMPIRICAL STUDY

Analyses of procedure

Based on the logic structure of Figure 2, this study used mouthwash as a subject product to deduct the logic of constructing the HVM. The procedures used for this research were shown as the following:

(1) Gathering related information of various brands of mouthwash from their DM and Web, three coders defined the attribute variables through content analysis, and the rate of agreement between reviewers and reliability were (0.82+0.78+0.77)/3=0.79 and 3*0.79/(1+2*0.79)=0.92. A total of thirteen attributes were decided that included “volume”, “color”, “flavor”, “sense of taste”, “brand”, “expired date”, “resistance of effect”, “ingredient”, “product package”, “promotion method”, “price”, “advertising” and “cleaning effect”.

(2) Focus group interview were conducted 3 times and a total of 18 participants attended in the interviews. A total of 11 benefit variables were obtained which included “good price”, “preventing bad breath”, “fighting cavities”, “remove plaque”, “prevention against periodontal disease”, “fresh breath”, “cleaning the oral cavity”, “hygienic feelings”, “healthy”, “washing out of food residuals”, and “feeling cool”.

(3) To classify attribute levels, the researchers collected mouthwash brands such as Oral B, Day and Night, Scope and Listerine from the retail stores and recorded their attribute levels. The attribute levels, for instance, can be classified as volume divided into “less than 200 ml”, “210-350 ml”, “351~500ml”, “501~650ml”, “more than 650ml”, and “not important at all”, or color divided into “red”, “yellow”, “green”, “blue”, “others”, “not important at all”, and etc.

(4) Nine value variables were determined by the list of value (LOV) inventory proposed by Kahle (1986) which were “sense of belonging”, “excitement”, “warm relationships”, “self-fulfillment”, “respected by others”, “fun and enjoyment”, “security”, “self-respect”, and “accomplishments”.

(5) Data were collected and recorded in the summary implication matrix. Open-ended questionnaires (in-depth interviews) or structural questionnaires could be used to collect data. Traditional MECs collected data from the in-depth interviewing (so-called “soft” laddering)(Reynolds and Gutman, 1988), however nowadays several scholars suggest that structural questionnaires be used on the web to collect data because they may be easier to transfer data into systematic analysis than open-ended questionnaires (so-called “hard” laddering)(Ter Hofstede, Audenaert, Steenkamp and Wedel, 1998; Russell, Flight, Leppard,

van Pabst, Syrette, and Cox, 2004). In this study, the previous research variables (attribute levels, attributes, benefits, and values) were used for structure questionnaire design (hard laddering). A total of 400 valid samples were collected. These collected samples provided not only consumer preferences of those research variables but also the demographic information of consumers. Adopting the laddering technique developed by Reynolds and Gutman (1988), the researchers put all respondents' information in the table of summary implication matrix.

(6) The cutoff value can be determined either by a percentile with an average number normally falling in the 75 to 85 percent range (Gengler and Reynolds, 1995) or by a simulation distribution. This study suggests that a percentile be used if the particular product life cycle is short or the frequencies of modifying HVM (because new data were updated in the information system) are low. Because of the mouthwash products with lower frequencies of constructing HVM, this study adopted a percentile to determine the cutoff value. The cutoff value of 18 accounted for 81 percent of all of the connection in the raw laddering data and the cutoff value of 8 accounted for 80 percent of all of the connection in the raw laddering data. Obviously, these two cutoff values exist a large range. In this study, the cutoff value was decided to be 18. While constructing a system, the programmers should allow system users to determine what percentage they want to use and make the system to provide different HVMs when the percentage was changed. This will benefit marketers to formulate their product strategies.

(7) Selected the modes of attribute level variables and recorded on the bottoms of their belonging attributes on the HVM. The procedures of constructing the HVM is simply followed the logic of constructing the HVM mentioned previously.

(8) Using the produced HVM can be able to develop marketing strategies.

Results

The mouthwash product is a product for wide ages in Taiwan. To differentiate the demographic characteristics and to increase respondents' preference differentiations among product characters, the interviewers tended to interview respondents with equality in gender, marriage statues and average ages of 30s. A sample of N=400 mouthwash consumers was drawn in Taiwan in 2003. Households were selected at random with a quota imposed on region of third biggest city in Taiwan. The interviews were then conducted with the respondents. The mean age of the respondents was 33.1 years (S.D.=12.07), Household members were 5.26, 48% were married, and 50% were male. Figure 3 shows the mouthwash HVM derived from the previous logical procedures.

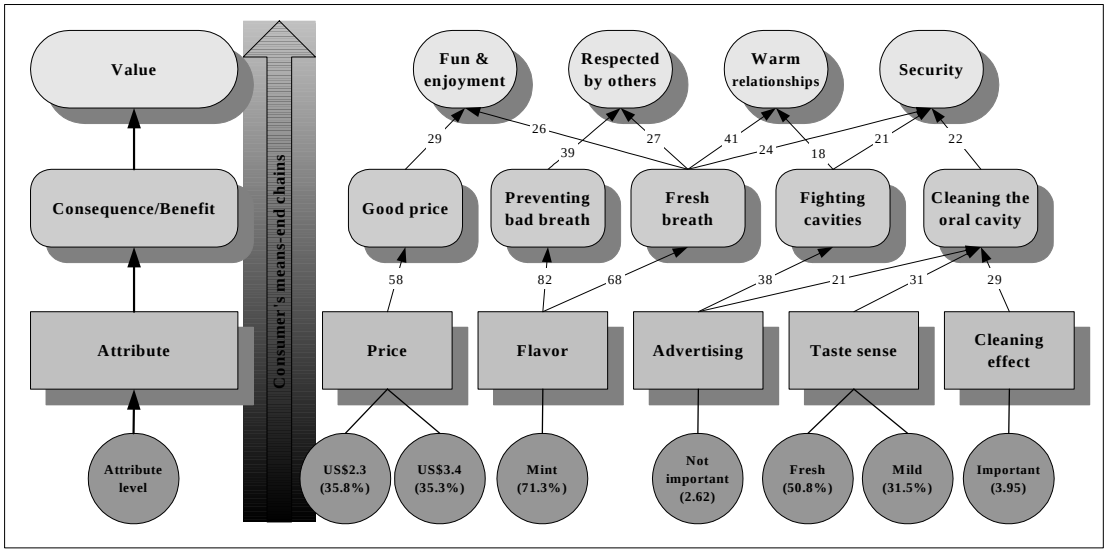

Figure 3: Hierarchical value map of mouthwash rinse

This study used MEC methodology as a base to develop the cognition structure of " product design-value demand" linkages, contributing to the analysis of logics of programming design. With the logic of cognition structure, marketers can use the HVM to develop their marketing strategies and enhance their product competitive advantages.

CONCLUSION AND FUTURE RESEARCH

Qualitative analysis rests on personal judgments which is usually criticized as subjective factors, therefore many scholars propose that understanding the logical implications and providing an efficient contrivance to comprehend the characteristics of qualitative analysis (Pasquier and Rossier, 1982; Mark et al., 1997). Future researches can simply follow the logic of decomposing qualitative analysis in this study to analyze qualitative theory and develop qualitative information system, in order to reduce the influence of personal subjective judgments and increase the accuracy of using qualitative analysis accordingly. Business can use the qualitative information system to develop effective managerial strategies.

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