

Using Multi-attribute Utility Theory to Rank and Select Co-branding Partners

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Abstract

As many companies seek growth through the extension of new markets, co-branding strategy provides an avenue to provide signals of quality and image as successful brands. In the last decade, co-branding and other cooperative brand activities have seen a 40% annual growth. The present study utilizes big five model of brand personality concept to explore the potential co-branding partners by employing multi-attribute utility theory (MAUT) to estimate and rank utilities for possible partners from big five model. This work attempts to demonstrate the proof-of-concept of our approach for a company in determining a beneficial and supportive co-branding partner.

1. Introduction

As many companies seek growth through the extension of new markets, co-branding strategy provides an avenue to provide signals of quality and image as successful brands. Co-branding is a special case of brand extension in which two brands are extended to a new product. In a co-branding alliance, the participating companies should have a relationship that has potential to be commercially beneficial to both parties. A successful co-brand has the potential to achieve excellent synergy that capitalizes on the unique strengths of each contributing brand. In the last decade, co-branding and other cooperative brand activities have seen a 40% annual growth [1].

Grossman (1997) broadly defined co-branding as “any pairing of two brands in a marketing context, such as advertisements, products, product placements, and distribution outlets” [27]. More narrowly defined, co-branding stands for the combination of two brands to create a single, unique product [1][3][14]. Companies form co-branding alliances to fulfil several goals, including: (1) Increasing sales revenue, (2) exploring new markets, (3) sharing of risk, (4) improving product image and credibility, and (5) increasing customer confidence. One industry in which

co-branding is frequently practised is the fashion and apparel industry [12].

The basic principle behind co-branding strategies is that the constituent brands assist each other to achieve their objectives. Utilizing two or more brand names in the process of introducing new products offers competitive advantages. The purpose of the double appeal is to capitalize on the reputation of the partner brands in an attempt to achieve immediate recognition and a positive evaluation from potential buyers. The presence of a second brand on a product reinforces the reception of high product quality, leading to higher product evaluations and greater market share.

Nevertheless, co-branding may also affect the partner brands negatively. James (2005) showed that combining two brands may cause brand meaning to transfer in ways that were never intended [4]. The potential benefits and risks associated with co-branding strategies must be explored and carefully examined. Several failed examples demonstrate incorrect co-branding partner selection, such as BenQ/Siemens, Hp/Compaq, and BMW/Range rover. Consequently, the pre-estimation and selection of co-branding partners is extremely significant for a successful company.

The present study utilizes big five model of brand personality concept to explore the potential co-branding partners. Big five model is the most well-known theory to measure brand personality in brand management. Aaker (1997) initially relates the traits of human to brand based on big five model [16]. Furthermore, we employ multi-attribute utility theory (MAUT) to estimate and rank utilities for possible partners from big five model (e.g., five factors). This work attempts to provide a feasible approach to a company in determining a beneficial and supportive co-branding partner.

Several advantages are identified from the present work: (1) providing clues for ranking and selection of co-branding partners, (2) exploring the brand personality of the potential partners primitively, (3) utilizing MAUT approach to estimate utilities of the

partners and (4) furnishing a roadmap for brand alliance research. The rest of the paper are organized as follows, section 2 briefly defines the brand personality and MAUT from the literature, section 3 demonstrates the research framework and a proposed algorithm , section 4 provides evaluated results, and a conclusion is furnished in section 6.

2. Theoretical Background

2.1 Brand Personality

Big five model, proposed by Galton (1884), is the most well-known theory to measure personality in psychology which employs lexical hypothesis to describe human personalities [10]. Initially, Allport and Odbert (1936) extend Galton’s theory to 17953 adjectives for describing human personalities [13]. Owing to the complicated measurement, Cattell (1943) reduces the number of adjectives from 17953 to 171 [27]. Next, Fiske (1947) utilizes factor analysis to extract 171 adjectives to five factors for human personality [9]. Finally, Norman (1963) summarizes certain literature and redoes factor analysis to develop the big five model [31].

The most used version of big five model is modified by McCrae et al. (1986) and Goldberg (1990) with five factors: surgency, agreeableness, dependability, emotional stability, and culture [27][19]. Hough and Schneider (1996) verify that big five model is a good classification framework to measure human personality [20]. Borkeanu (1992) and Peabody (1987) conduct the empirical research for big five model, and confirm to the research of MaCrae and Goldberg [23][7].

Kolter (2000) considers brand can deliver six levels of meaning to customers, for example, attribute, benefit, value, culture, personality, and users [25]. Brand personality is “the human personalities related to a brand” [4]. That is, the difference between brand and human is the source [17]. The human personality came from a person’s behavior, appearance, attitude and belief [19] and the brand personality is the sum of messages such as experience, word of mouth, advertisement, and service. A strong brand personality may affect the customers, strength the purchase intension, and build the relationship with customers.

According to the explanation of Keller (1993), brand is not only the characteristic but the ability of self-expression [18]. Aaker (1997) constructs a brand personality framework which derives from big five model and enfold 42 characteristics in 5 dimensions [22]. The five dimensions can mostly explain the brand personality from sampling 1000 US citizens and utilizing 60 brands from 42 questions in the survey. These characteristics/ dimensions and their facets as

defined as: (1) sincerity (down-to-earth, honest, wholesome, cheerful), (2) excitement (daring, spirited, imaginative, up-to-date), (3) competence (reliable, intelligent, successful), (4) sophistication (upper class, charming), and (5) ruggedness (outdoorsy, tough).

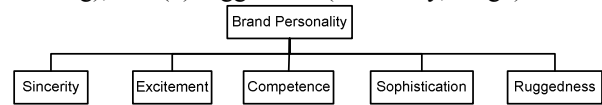


Figure 1 Brand personality framework

Conversely, Fames et al. (2006) identify and verify the branding elements that consumers use when evaluating brand alliances [6]. The study looks at abstract personality issues and considers how consumer-rated brand personality traits fit and transfer. The findings reveal that managers should focus on discovering similarity between brand alliance partners in terms of brand personality. Meanwhile, the likelihood of the consumers to purchase the new product is improved where two brands do fit together.

Aaker et al. (1994) propose a conceptual model to verify whether brand personality and transgression affect partner quality, and partner quality further influences the relationship strength [14]. The effects of personality on the relationship are also conducted. The findings suggest a dynamic construal of brand personality, greater attention to interrupt events, and consideration of the relationship contracts formed at the hands of various brands. The aforementioned works demonstrate the interaction between brand personality and brand alliance; in particular, indicate the significance of these two issues for future research.

2.2 Multi-Attribute Utility Theory

The field of traditional decision theory [8] provides tools for rational decision making. Optimality is defined in terms of preference statements made by the decision maker. Specifying economic preferences between alternatives provides simple means for capturing goals and is well understood by decision makers. All decision alternatives are identified along with their respective consequences. The desirability of each consequence is determined using statements of preference from the decision maker. Probability is used to measure the likelihood of a consequence and a utility function is used to measure desirability of an alternative/consequence pair. Using this formulation, the alternative that provides the highest expected utility is chosen.

As for the decision-making related research, Shachaf and Hara (2007) propose a behavioral complexity theory (nonlinear) for media selection in global virtual teams which captures multiple contingencies into one holistic approach to media selection [26]. Hayward and Preston (1999) employ

chaos theory to analyze the rationality and uncertainty [31]. Chaos theory allows for the possibility of an awareness of a range of future states; meanwhile, suggests that the past is not an accurate guide to the future.

Multi-Attribute Utility Theory (MAUT), proposed by Fishburn (1970), provides means to evaluate the desirability of multi-attribute consequences and facilitates multi-attribute decision making based on a decision theoretic approach [24]. For mutually preferentially independent attributes, the multi-attribute utility function is expressed as a weighted summation of attribute utility functions. However, all feasible alternatives must be enumerated and evaluated in order to specify the utility function which is also a major limitation for utility function.

According to MAUT, the overall evaluation $v(x)$ of an object x is defined as a weighted addition of its evaluation with respect to its relevant value dimensions. The overall evaluation is defined by the

following overall value function:
$$v(x) = \sum_{i=1}^n w_i v_i(x).$$

Here, $v_i(x)$ is the evaluation of the object on the i -th value dimension d_i and w_i the weight determining the impact of the i -th value dimension on the overall evaluation (also called the relative importance of a dimension), n is the number of different value

dimensions, and $\sum_{i=1}^n w_i = 1$.

For each value dimension d_i , the evaluation $v_i(x)$ is defined as the evaluation of the relevant attributes:

$$v_i(x) = \sum_{a \in A_i} w_{ai} v_{ai}(l(a)).$$
 Here, A_i is the set of all

attributes relevant for d_i , $v_{ai}(l(a))$ is the evaluation of the actual level $l(a)$ of attribute a on d_i . w_{ai} is the weight determining the impact of the evaluation of attribute a on value dimension d_i . w_{ai} is also called relative importance of attribute a for d_i . For all d_i ($i=1, \dots, n$) holds $\sum_{a \in A_i} w_{ai} = 1$. In order to evaluate the attributes, it is necessary to construct a scale representing the properties of the levels of an attribute.

MAUT enables the decision maker to structure a complex problem in the form of a simple hierarchy. Additionally, subjectively evaluate a large number of quantitative and qualitative factors in the presence of risk and uncertainty. The major strength of MAUT is the ability to deal with both deterministic and stochastic decision environment [30]. The systematic nature of MAUT in tackling complex problems under conflicted multiple criteria makes MAUT especially

suitable for selecting the most appropriate brand alliance partner.

3. Research Method

3.1 Research framework

The selection of co-branding partners around the world is not a process to be taken slightly owing to its significant and long-lasting impact on successful co-branding strategies. If the selection is wrong, it may result in reducing the sales, shoddy product quality, and negative brand image; that is, a few of the problems the firm can encounter. As such, the co-branding partner selection decision is not trivial since it involves a large number of closely interrelated decisions for a brand personality.

Owing to the large number of factors affecting the decision, the decision should be made based on an orderly sequence steps. Most decision makers cannot simultaneously handle more than seven to nine factors when making a decision [11]. Thus, it is necessary to break down the complex problem into more manageable sub-problems through the multi-levelled decision hierarchy.

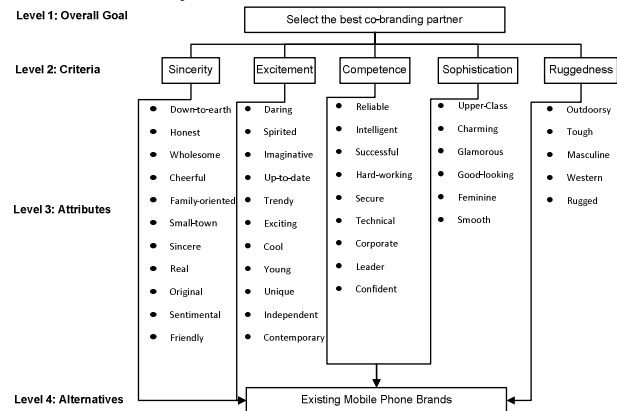


Figure 2 Research framework

Figure 2 shows the structuring of the co-branding partner selection problem into a hierarchy of four levels. The top level of the hierarchy represents the goal of the problem (e.g., selecting the best partner). The second level of the hierarchy enfolds the general criteria which are usually considered significant in selecting the best co-branding partner.

3.2 Research Process

This study aims to rank utility values of all partners and advance the quality of partner selection. Moreover, we attempt to provide more clues for decision makers by furnishing perceived values from user perspective. Based on research framework, four research processes are identified as shown in Figure 3.

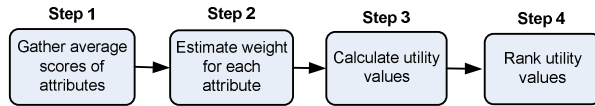


Figure 3 Research process

4. Simulation and Discussion

4.1 Simulation Results

For illustrative purpose, the base-line scenario involves selecting the most appropriate global brand that sells the mobile phones. The base-line scenario considered eleven potential brands from different countries: NOKIA, Motorola, Sony-Ericsson, Sharp, Samsung, BenQ-Siemens, Panasonic, Toshiba, Asus, LG, and Gplus.

Under this scenario, we collected required information such as weight scores and decision scores from online users. This study provides an online questionnaire to all users who may contribute their perceptions. The results empower the collective intelligence from consumer perspective. The questionnaire is separated into two parts; first part inquires user perception of significance for a mobile phone company in terms of all attributes. Second part of the questionnaire inquires user decision in behavioral perspective; for example, users can assume they are decision makers and give decision score for each attribute respectively (e.g., the range is from 0 to 10 for each attribute of the perceived degree).

We collected 43 responses from the experiment excluding incomplete answers. The reason for low response is that the number of attributes is large and online users may not pay attention to completing it. However, this work is the first attempt to combine these two concepts (MAUT and brand personality). We still can utilize limited responses to prove our concept. Hence, the relative weights of attributes were determined from the collected data.

The weights were determined by calculating the scaling constant for each attribute based on the assumption. That is, an overall utility for each alternative can be expressed as an additive multi-attribute utility function shown in equation (1). This work estimates the average weight for each attribute and approximates the relative weights for all attributes.

$$U(x) = w_1U_1(x) + w_2U_2(x) + \dots + w_nU_n(x) \quad (1)$$

Where

$U(x)$ = the overall utility for alternative x

w_i = the weight for attribute i; also called scaling constant w for attribute i.

Based on the weights, the attribute of up-to-date is most important, followed by young, trendy, corporate,

cool, unique, and so on. The results reveal that the decision maker prefers a brand with newly, trendy, and unique characteristics. Hence, the estimated weights can establish the utility function and compute the overall utility score for each alternative and rank them accordingly.

4.2 Discussion

In the dimension of sincerity (Figure 4), SonyEricsson (1.9518075) and NOKIA (1.926734) are two brands in the leading group. However, LG (1.4367335) and GPlus (1.3229348) are worst two brands in sincerity dimension. NOKIA and SonyEricsson have positive brand image in sincerity dimension; furthermore, they dedicate in telecommunication industry for research and development. The result confirms these two brands lead the competitive advantages in an openness and trueness way. Consequently, NOKIA and SonyEricsson will be excellent collaborators in sincerity dimension if a company wants to select a superior co-branding partner.

In the dimension of excitement (Figure 5), NOKIA (2.85445266) and Sharp (2.76935332) are the two brands in the leading group. Nevertheless, they are two different countries which have various background and culture. In other words, NOKIA and Sharp devote into innovated concept of mobile phone development. For example, NOKIA launched several mobile phones that embedded GPS or PDA functions. In the development of Japanese mobile phone industry, the life-style concept is employed and combined with mobile phone to solve real-time needs (e.g., Keitai for NTT DoCoMo). Conversely, LG (1.4367335) and GPlus (1.3229348) cannot surprise the consumers as a result of insufficient innovated design.



Figure 4 Utilities in sincerity dimension

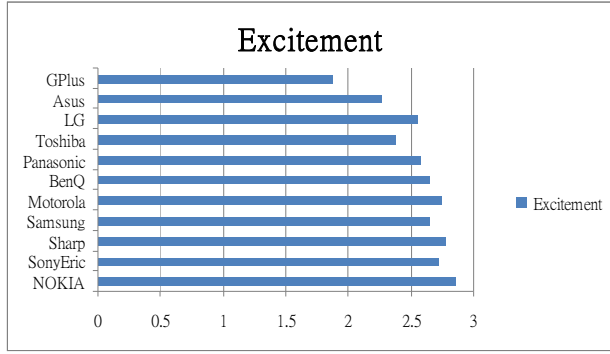


Figure 5 Utilities in excitement dimension

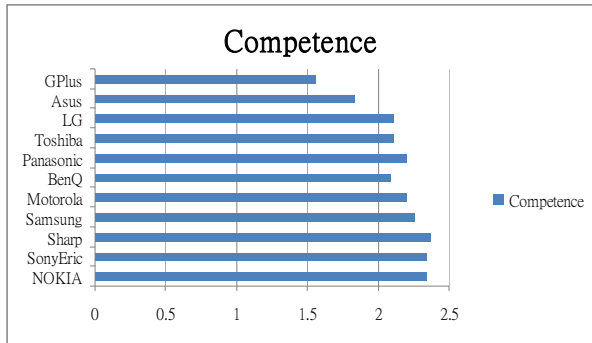


Figure 6 Utilities in competence dimension

In the dimension of competence (Figure 6), Sharp (2.366896595), NOKIA (2.339901019), and SonyEricsson (2.337595149) are three brands in the leading group. In particular, Sharp indicates the different design philosophy of typical Japanese companies. For example, people in Japan utilize cellular phone to do micro-payment, play games and watch video on demand, transact over the Internet, and so on. NOKIA and SonyEricsson typically increase innovative functions in their mobile phone design. Conversely, GPlus (1.560100539) and Asus (1.836336498) present low perceived utility as a result of the sufficient experience in telecommunication industry.

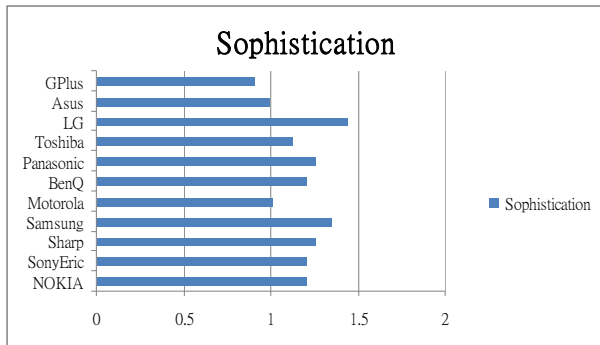


Figure 7 Utilities in sophistication dimension

In the sophistication dimension (Figure 7), LG (1.440572801) and Samsung (1.347167689) are two

brands in the leading group. LG launched many fashion styles of mobile phones with new technology such as tough-sensitive keys. For example, LG PRADA and LG Shine are two upper-class exemplars. Meanwhile, Samsung also delivered mobile phones with tough-sensitive keys function recently. Followed by LG and Samsung, Sharp and Panasonic are the second group in this dimension. Particularly, Motorola (1.003957713) has negative brand image in sophistication dimension as the result of cultural reason. In other words, the US companies always emphasize on rugged factor for mobile phone design.

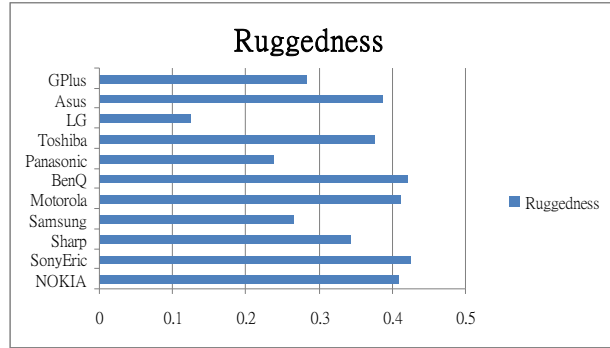


Figure 8 Utilities in ruggedness dimension

In the ruggedness dimension (Figure 8), SonyEricsson (0.425566811) and BenQ (0.421387145) are two leading brands and followed by NOKIA (0.409184005) and Motorola (0.41100577). These four brands show consolidated image of the phones from consumer perspective and masculine. Conversely, most of Korea and Japanese brands are slender and slight.

5. Conclusion

The decision maker sometimes faces the dilemma in selecting a good co-branding partner. The wrong decision will result in failing operation and increase the negative brand image. The present paper proposes a novel approach to rank the existing partners and assist the decision maker to select one. We utilize multi-attribute utility theory to estimate the perceived value from five dimensions of brand personality. The concept of brand personality is based on big five model from human personalities. MAUT can estimate the perceived value and rank them by scores and provide clues for decision making.

The experiment results confirm that NOKIA, sharp, and SonyEricsson are leading brands in the market. Moreover, they have competitive advantages in all dimensions. This study also recommends two possible strategies; for instance, the first one is to select a partner to complement and the second one is to select a similar partner. Several advantages are identified from the present work: (1) providing clues

for ranking and selection of co-branding partners, (2) exploring the brand personality of the potential partners primitively, (3) utilizing MAUT approach to estimate utilities of the partners and (4) furnishing a roadmap for brand alliance research.

7. References

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