

A STUDY OF THE RELATIONSHIP BETWEEN FUNCTIONS OF BRAND AND RESPONSE OF NOKIA MOBILE PHONE'S BUYERS AND USERS IN BANGKOK

> By MONLIGA SUTTHIPONGKOON

A Thesis submitted in partial fulfillment of the requirements for the degree of

Master of Business Administration

Graduate School of Business Assumption University Bangkok Thailand

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ABSTRACT

Mobile phone is becoming an important gadget in life. It makes the user more convenient communicating with others even though they live so far away. Nokia mobile phone is one of the most famous brands in mobile phone industry.

This research is conducted to find the relationship between functions of brand and response of Nokia's mobile phone buyers and users in Bangkok.

Functions of brand have four dimensions, which consist of guarantee, personal identification, social identification, and status. These are independent variables. Consumer response is dependent variable consisting of intention to purchase line extensions product, recommendations for the brand and price premium.

The research instrument is 400 questionnaires. Then, the structural equation modeling (SEM) is the statistics. LISREL program is used to analyze the structural model and test hypotheses.

The results from the test of twelve hypotheses confirm only seven alternative hypotheses. This means that consumers respond to guarantee, personal identification and status functions. The consumer's perception gives more interest to personal identification than other functions that make consumer have the intention to purchase line extensions product, recommend to others and pay a price premium for the brand.

A major recommendation is that answers do not respond to all that the functions of brand (guarantee, personal identification, social identification, status) that consumer respond of Nokia mobile phone. The researcher recommends the manufacturer to continuously build brand image, develop their quality of product and give differentiated products by adding more features and functions to meet the consumer's need.

Further more, the marketer should offer different services strategy from competitors to find new customers and maintain their customers.

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CHAPTER 1 GENERALITIES OF THE STUDY

1.1 Introduction of the study

A basic decision in marketing products is branding, by which a manufacturer uses a name, phrase, design, symbols, or combination of these to identify its products and distinguish them from those of competitors. "Branding policy is important not only for manufacturers, but also for retailers and consumers. Retailers value branding because consumers shop for desired brands. Consumers may also benefit most from branding. Recognizing competing products by distinct trademarks allows them to be more efficient shoppers. Consumers can recognize and avoid products with which they are dissatisfied, while becoming loyal to other, more satisfying brands. Brand loyalty often facilitates the consumers' decision making by eliminating the need for an external or extended search" (Liu, 2002).

Brands play an integral part in marketing strategy. This is because brands have become an important marketing component to the manufacturer (Murphy, 1990; Motameni and Shahrokhi, 1998) and a rich source of information for the consumer (Aaker and Biel, 1993). For the manufacturer, brands provide a means of identification for ease of handling and tracing, a means of legal protection of unique features, and of endowing products with unique associations (McCarthy and Perault, 1990; Kotler and Armstrong, 1997). Furthermore, brands signal quality levels to consumers, and can be effectively used to gain a competitive advantage (Skinner, 1990) and secure financial returns (Collins-Dodd and Louviere, 1998). To the consumer, a brand identifies the source of the product, which in turn, assigns responsibility to the product maker, and provides a promise or bond with the maker of the product (Lassar et al., 1995).

Increasingly, brands are seen as important in creating individual identity, a sense of achievement and individuality for consumers. It is also evident that certain brand dimensions and associations lead to increased marketplace recognition and economic

success for brand owners, as a result of the value consumers place on them. A company's economic superiority is frequently implied by the strength of its brand name, giving it the ability to differentiate itself and improve its competitiveness (Nykiel, 1997).

Brands create value for the consumer through potential benefits of recognition of significant others, create positive feelings, aid self-expression, coupled with an overall feeling of having personal "good taste" in brand choice (Langer, 1997). Status brands in particular have higher perceived quality, luxury or prestige ascribed to them and their consumption. Status enhancing brands may be used as a means to an end, such as making a desired impression on others via their symbolism. Brands positioned to maintain exclusivity communicate the prestige, status and role position of the brand-user (Zinkhan and Prenshaw, 1994).

1.2 Mobile Phone Industry

The direction of mobile phone is changed because the manufacturers have production plan of mobile phone in two main markets that is group of middle to low market and group of middle to upper market. The manufacturers have speeded up to build brand image, develop high quality of product and quality of services after sales to expose to the consumers and attract them.

The market of mobile phone has largely changed affecting the distribution structure of manufacturers. The causes are Total Access Communications Plc. (DTAC) to unlock EMI and Sims Card that separates the market of operator service and manufacturers. In addition, the price of mobile phone has changed rapidly.

The vendor of mobile phone created the new design and innovation by developing the applications for use on mobile phone, as seen in services such as SMS, WAP, MMS, GPRS and JAVA. The manufacturers of Sony Ericson, Nokia, Samsung and LG are interested in photograph's mobile phone market. They are trying to find the differentiated services after sales to attract the customers.

Brand	Company	
Nokia	Nokia (Thailand) Cô.,Ltd.	
Siemen	Siemen (Thailand) Co.,Ltd.	
Sony Ericson	Sony Ericson Mobile Communication International AB	
	(Thailand) Co.,Ltd.	
Motorola	Motorola (Thailand) Co.,Ltd.	
Philip	Philip Electronics Co.,Ltd.	
Samsung	Thai Samsung Electronics Co.,Ltd.	
LG	LG Mitr Electronics Co.,Ltd.	
Mitzubishi	Mitzubishi Electronics Co.,Ltd.	
Panasonic	Zew National Co., Ltd.	
Sagem	Samart E-Trading Co.,Ltd.	

Table 1.1 The brand name of manufacturers of mobile phone

Source: www.Marketinfo.in.th

Figure 1.1 Market Share of Thai Mobile phone, 2002



Source: Sony Ericsson Mobile Communications International AB (Thailand) Company Limited

The researcher decided to study Nokia mobile phone because Nokia dominated the most market share, up to 33% in the year 2002 and Nokia is still the most admired brand of mobile phone according to the research of "Most Admired of Mobile Phone" from Brand Age Magazine. The total number of respondents is 1,931. There are 954 males (49.40%) and 977 females (50.60%) respondents. They are divided into five regions: (1) Bangkok/Central 387 respondents (20.04%), (2) Northern 386 respondents (19.99%), (3) Northeastern 384 respondents (19.89%), (4) Eastern 386 respondents (19.99%) and (5) Southern 388 respondents (20.09%). Table 1.2 shows the most admired brand of mobile phone.

of the local division of

Rank	Brand	Bangkok (%)	Total (%)
Year 2003	4		
1	Nokia	29.75	27.88
2	Motorola	19.52	20.13
3	Siemens	16.96	17.15
4	Sony Ericsson	D S 16.41	16.91
5	Samsung	10.18	9.08
6	Philipson	1.85 _{cm}	2.71
7	Alcatel	1.67	2.65
8	Panasonic	1.30	1.85
9	Nec	0.39	0.45
10	Other	1.10	0.29

Table 1.2 Most Admired Brand of Mobile Phones, 2003

Source: Most Admired Brand; BrandAge Magazine, 2003, P.67

1.3 Background of Nokia Mobile Phone

Nokia Today

Nokia is the world leader in mobile communications. Backed by its experience, innovation, user-friendliness and secure solutions, the company has become the leading supplier of mobile phones and a leading supplier of mobile. Nokia creates new opportunities for companies and further enriches the daily lives of people around the globe¹.

Business Units

Nokia comprises three business groups: Nokia Mobile Phones, Nokia Networks and Nokia Enterprise Solutions. In addition, the company includes a separate Nokia Ventures Organization and the corporate research unit, Nokia Research Center².

<u>Nokia Mobile Phone</u>

Nokia Mobile Phones is the world's largest mobile phone producer. With comprehensive product portfolio covering all consumer segments and cellular protocols, Nokia is in a strong position to lead industry development, based on vision of a world where an increasing share of all personal communication occurs over personal wireless terminals such as mobile phones³.

SINCE1969

As the functionality of mobile phones moves from voice-centric to include media, imaging, entertainment and business applications, whole new markets are being created and the growth opportunities are enormous. In 2002, Nokia's market share rose for the fifth consecutive year to an estimated 38%. A record number of 33 new products for the full year was also shipped. At the end of 2002, Nokia Mobile Phones represented approximately 77% of Nokia's net sales⁴.

¹www.nokia.com/nokia/0,8764,33080,00.htm

²www.nokia.com/nokia/0,8764,33080,00.htm

³www.nokia.com/nokia/0,6771,33082,00.html

Winning in the mobile phone market is not about product offering alone. Competition is based on mastery of the entire business system. As this industry grows in complexity, investment and competence requirements in key areas like brand, logistics and new product development are constantly increasing⁵.

Strategy

The cornerstones of Nokia's mobile phone strategy in working towards sustainable growth and profitability are threefold: 1) differentiating through total product offering, 2) leveraging the installed base and the Nokia brand, and 3) benefiting from the strength of demand-supply network⁶.

Brand as an Asset

Nokia is in a unique position to build on our established success and recognition. Nokia's strong brand combined with the scale advantages of leading market position and largest user group can continue to translate well into future growth. In 2002, Nokia grew its full-year market share in mobile phones for the fifth consecutive year, reaching 38%. This means the scale benefits to be had in terms of cost-efficiencies and getting greater numbers of new products out in a shorter time to market are unmatched in this industry⁷.

⁴www.nokia.com/nokia/0,6771,33082,00.html ⁵www.nokia.com/nokia/0,6771,33082,00.html ⁶www.nokia.com/nokia/0,6771,33082,00.html ⁷www.nokia.com/nokia/0,6771,33082,00.html

1.4 Statement of Problem

In many parts of the world, mobile phones have become such a part of everyday life. For world travelers, mobile phones can offer some incredible benefits. However, they also present certain challenges, not the least of which is whether they will even work when traveling from one place to another⁸. Along with the obvious convenience and quick access to help in emergencies big and small, mobile phones can be both economical and essential for travelers trying to stay connected⁹.

The mobile phone industry has intense competition and the needs and wants of mobile phone have expanded increasing. The mobile phone market has been growing as a result of the continuous launching of the many new designs of mobile phone. The consumers give more importance to the second and third mobile phone. It has launched many color screen mobile phones into the market while the price of mobile phone is decreased continuously. There are many brands of mobile phones in the market that make the consumers have more choices to consume and also make heavy competition in the market.

It is the important factors that producers of mobile phone companies respectively have to compete in order to produce the mobile phone directly with the needs of buyers in mind. The producers have considered the marketing strategy in mobile phone by producing many functions and innovation to attract and have more choices for the consumers.

⁸www.kropla.com/mobile phones.htm

⁹www.kropla.com/mobile phones.htm

Mobile phone producers are more likely to attempt to maintain their market share by focusing on retaining current customers. Each producer has been seeking for competitive advantage in attributes to increase market share. It is very useful to know how mobile phone producers can build a position in customer's mind.

Therefore, the statement of the problem is "What is the relationship between functions of brand and response of Nokia mobile phone's buyers and users in Bangkok?"

1.5 Research Objectives

- 1. To analyze the functions of brand in accordance with four dimensions: guarantee, personal identification, social identification and status based on the functions or benefits that the consumer associates with the brand Nokia mobile phone.
- 2. To study the influence exerted by each of these four dimensions on the consumer's willingness to pay a price premium for the brand, recommend it to others and have the intention to purchase line extension product of Nokia mobile phone.
- 3. To find the relationship between consumer response and functions of brand which are guarantee, personal identification, social identification and status of Nokia mobile phone's buyers and users in Bangkok area.
- 4. To determine and suggest which dimensions of brand functions consumers give more attention to in relation to the consumers' response.

1.6 Scope of the research

This research examines the relationship between functions of brand (guarantee, personal identification, social identification, and status) and consumer response of Nokia mobile phone's buyers and users. The respondents of this research are buyers and users of Nokia mobile phones in Bangkok area.

There are many districts in Bangkok. Because of convenience, the researcher selected the following districts of Bangkok:

Assumption University Major Cineplex-Ratchayothin Central-Ladpao Bic C- Ramkamhaeng Kasetsart University Major Cineplex-Ramkamhaeng The Mall-Bangkapi Tops Supermarket-Kaset

The respondents were selected according to the convenience and availability for the survey.

1.7 Limitations of the research

- 1.7.1 The present research focuses attention on finding out relationship between function of brands and response of Nokia mobile phone's buyers and users in Bangkok. Due to the limitation of time and budget and the fact that consumer behavior in Bangkok and other provinces are different, findings in this research may not be generalized for respondents not residing in Bangkok.
- 1.7.2 This research focuses on finding out relationship between selected functions of brand and response of Nokia mobile phone buyers and users in Bangkok, therefore its findings may not be generalized for variables not included in the framework of this research.

1.7.3 This research is conducted in a specific timeframe during August 2003 to November 2003. There may be some changes in mobile phone market and consumer behavior. Therefore, its findings may not cover all time frames.

1.8 Significance of the study

The major significance of this study is understanding how Nokia mobile phone manufacturers can understand consumers' mind, be successful and build competitive advantage. In addition, consideration of the consumers' perceptions of brand functions: guarantee, personal identification, social identification and status are what manufacturers must pay more attention to and relate these to the consumer responses. Also, the results of marketing managerial effort results in brand-building activity and brand-harming activity. This information will be useful for marketers and help companies in designing marketing programs to match customers and produce new products to meet a consumer's need.

1.9 Definition of terms

1. Brand

feature that serves to identify the goods or services of one seller and to set them apart from those of competitors (Mason and Hazel, 1987).

Brand is name, symbol, or other distinguishing

Brand functions are associations related to intangible attributes or images added to the product thanks to its brand name (Rio, Vazquez and Iglesias, 2001).

3. Brand image

2. Brand Functions

Brand image defined as perception about a brand as reflected by the cluster of associations that consumers connect to the brand name in memory (Dobni and Zinkhan, 1990).

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The promise or guarantee of quality, is based on the appraisal that the brand is reliable, efficiently carries out its performance qualities and meets the generated expectations (Ambler, 1997).

An existing brand name extended to new sizes of different versions in the existing product category (Kotler, 2000).

A mobile radio telephone, often in an automobile, that uses a network of short-range transmitters located in overlapping cells throughout a region, with a central station making connections to regular telephone lines (Dictionary.com).

Consumers can identify themselves with some brands and develop feelings of affinity towards them (Graeff, 1996; Hogg et al., 2000).

Willing to pay higher price than competitor.

Anything can be offered to the market for attention, acquisition, use of consumption and that may satisfy a need or want (Kotler, 2000).

Recommend to others to purchase of the brand [Selnes (1993), Andreassen (1994), and Hutton (1997)].

The brand's ability to act as a communication instrument allowing the consumer to manifest

4. Guarantee

5. Line Extension

6. Mobile Phone

7. Personal Identification

8. Price Premium

9. Product

10. Recommendation

11. Social Identification

the desire to be integrated (Long and Shiffman. 2000).

12. Status

The feelings of admiration and prestige that the consumer may experience upon using the brand (Solomon, 1999).



CHAPTER 2

REVIEW OF RELATED LITERATURE AND STUDIES

Review of Literature

This chapter consists of two parts in reviewing the literature relevant to building a conceptual model of this research. Part one includes the concepts and theories related to independent and dependent variables. Part two has reviewed the previous empirical research.

2.1 Brand

A brand is a name, term, sign, symbol or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors (Kotler, 2000). And a brand is essentially a seller's promise to deliver a specific set of features, benefits, and services consistently to the buyers. The best brands convey a warranty of quality. But a brand is an even more complex symbol (Kapferer, 1992).

2.2 Brand image

Brand image is usually considered as the combined effect of brand associations (Biel, 1992) or more specifically as the consumer's perceptions of the "brand's tangible and intangible associations (Engel, Blackwell, and Miniard 1993). Roth (1994) notes that the consumer's brand image results from the cumulative effects of the firm's marketing mix activities. Brand image results from the consumer decoding, extracting, and interpreting the brand signal (Kapferer, 1992).

Brand image is what a consumer constructs and resides in an associative memory network that is critical to consumer decision making and potentially provides biased brand evocation and evaluation, ultimately contributing to brand equity (Holden, 1992). Brand associations, acquired through the firm's marketing mix activities or product use, contribute to and ultimately define the brand's image to the consumer (Keller, 1993).

2.3 Brand functions

Brand functions are associations related to intangible attributes or images added to the product thanks to its brand name. That is, they represent benefits that can only be obtained from products with a brand (Rio, Vazquez and Iglesias, 2001).

According to Rio, Vazquez and Iglesias (2001), brand functions are measured by dimensions : (1) guarantee, (2) personal identification, (3) social identification and (4) status.

2.3.1 Guarantee function

A guarantee is an assurance that the product is as represented and will perform property. Typically, if the product fails to perform, the organization making the guarantee replaces the product or refunds the customer's money. Guarantees imply to some customers that the manufacturer is confident of the new products' quality (Churchill and Peter, 1998).

The guarantee function is the promise or guarantee of quality, based on the appraisal that the brand is reliable, will efficiently carry out its performance qualities and meet the generated expectations (Ambler, 1997). Similarly, it is fitting to associate this function with the perception that the brand is linked to products with a suitable level of performance and is concerned about conveniently satisfying consumer needs, contributing variety and innovation (Sheth et al., 1991; Dubois and Duquesne, 1995).

2.3.2 Personal identification function

The personal identification function is related to the fact that consumers can identify themselves with some brands and develop feelings of affinity towards them. In the literature on brand influence, a basic theory refers to the congruence between the consumer's behavior, his self-image and the product image. This theory is based on the idea that individuals can enrich their self- image through the images of the brands they buy and use. In this way, the theory upholds that the greater the consistency between the brand image and the consumer's self-image, the better the consumer's evaluation of a brand and the greater is his intention to buy it (Graeff, 1996; Hogg et al., 2000).

Lassar, Mittal and Sharma (1995) pointed out that "identification is the degree to which customers identify themselves with the brand, or feel some attachment to it. In effect, consumers would say that it is their brand; it is the kind of brand they would be happy to be associated with. Often, identification occurs because the brand is associated with things, person, ideas, or symbols we find engaging".

2.3.3 Social identification function

Social identity theory is concerned with "the part of the individual's self-concept which derives from their knowledge of their membership in a social group together with the value and emotional significance attached to that membership" (Tajfel, 1982).

The social identification function is based on the brand's ability to act as a communication instrument allowing the consumer to manifest the desire to be integrated or, on the contrary, to dissociate himself from the groups of individuals that make up his closest social environment (those people with whom he currently interacts or aspires to do so). Consumers interested in this function will positively value those brands that enjoy a good reputation among the groups with which they belong to or aspire to form part of (Long and Shiffman. 2000).

2.3.4 Status function

The status function expresses the feelings of admiration and prestige that the consumer may experience upon using the brand (Solomon, 1999). According to Vigneron and Johnson (1999), this function is based on five characteristics of the brand:

(1) symbol of the individual's power and social status.

(2) reflection of social approval.

(3) exclusivity or limitation of the offer to a small number of people.

(4) contribution of emotional experiences.

(5) technical superiority.

In this way, Rio, Vazquez and Iglesias (2001) stated that "the status function, just like the social identification function, is revealed thanks to the need of individuals to communicate certain impressions to people in their social environment. However, the difference between the two functions lies in the fact that the social identification function is related to the desire to be accepted by and feel members of certain groups. On the other hand, the status function corresponds to the individual's desire to achieve prestige and recognition from others, without this necessary meaning that the brand is representative of their social group".

The above functions will generate value to the firm to the extent that they condition the consumer response to the marketing of the brand. Hence, Keller (1993, 1998) defines brand equity as the differential effect that brand knowledge (awareness and associations) has on consumer response to the marketing of the brand (in terms of consumer perceptions, preferences and behavior, e.g. brand choice, comprehension of copy points from an ad, reactions to a coupon promotion, or evaluations of a proposed brand extension).

2.4 Competitive Advantage

Competitive advantage is a company's ability to perform in one or more ways that competitors cannot or will not match (Kotler, 2000).

Thompson and Strickland (1996) stated that "a competitive advantage ... (is when)...a company has good prospects for above-average profitability and success in the industry. Without competitive advantage, a company risks being out competed by stronger rivals and locked into mediocre performance. Crafting a business strategy that yields sustainable competitive advantage has three facets":

- (1) Deciding where a firm has the best chance to win a competitor edge.
- (2) Developing product/services attributes that have strong buyer appeal and set the company apart from rivals.

(3) Neutralizing the competitive moves of rival companies.

Winning business strategies are grounded in sustainable competitive advantage. A company has competitive advantage whenever it has an edge over rivals in attracting customers and defending against competitive forces. There are many sources of competitive advantage: having the best-made product on the market, delivering superior customer service, achieving lower costs that rivals, being in a more convenient geographic location, proprietary technology, features and styling with more buyer appeal, shorter lead times in developing and testing new products, a well-known brand name and reputation, and providing buyers more value for the money. Essentially, though, to succeed in building a competitive advantage, a company's strategy must aim at providing buyers with what they perceive as superior value-a good product at a lower price or a better product that is worth paying more for (Thompson and Strickland, 1996).

Competitive advantage is based on excelling in providing one or more of three forms of customer value. Customers want goods and services that are (1) better and (2) cheaper, and they want them (3) faster. There are three corresponding forms of competitive advantage as (1) differentiation, (2) cost leadership, and (3) quick response (Miller, 1998).

According to Rio, Vazquez and Iglesias (2001), the effect of brand functions on consumer response constitutes a highly important subject when analyzing the value the brand has for the firm. The competitive advantages that result from a positive brand image can be categorized into three general components:

- (1) advantages related to current performance and profitability the brand's ability to command higher margins and/or volume, more inelastic consumer response to price increases, increased marketing communication effectiveness and greater trade co-operation.
- (2) advantages related to longevity of profits brand loyalty, less vulnerability to competitive marketing actions, less vulnerability to marketing crises.
- (3) advantages related to growth potential possible licensing opportunities, generation of positive word-of-mouth, brand's ability to introduce new products as brand extensions.

Brand associations have a positive influence on consumer choice, preferences and intention of purchase, their willingness to pay a price premium for the brand, accept brand extensions and recommend the brand to others (Park and Srinivasan, 1994; Cobb-Walgren et al., 1995; Agarwal and Rao, 1996; Hutton, 1997; Yoo et al., 2000).

2.5 Consumer Response

Hutton (1997) studied "brand image that focused on grouping all the associations into a single dimension. However, it is foreseeable that brands of equal value for the consumer, in overall terms but not dimension by dimension, are differentiated as to the level and type of consumer response. Therefore, it is also interesting to analyze the individual effects of each of the different dimensions. This will enable marketers to guide brand decisions more appropriately, identifying which associations have to be strengthened in order to achieve the desired consumer response".

This research, in accordance with Rio, Vazquez and Iglesias (2001), examines the influence exerted by each of the dimensions of the brand functions on three variables that reflect the consumer's willingness to:

- (1) purchase line extensions product.
- (2) Recommend it to others.

(3) Pay a price premium for the brand (competitive advantage related to current performance and profitability).

2.5.1 Line extensions

Kotler (2000) stated that "line extension is existing brand name extended to new sizes or favors in the existing product category. Line extensions consists of introducing additional items in the same product category under the same brand name, such as new flavor, forms, colors, added ingredients, and package sizes.

Line extensions can and often do have a positive side. They have a much higher chance of survival than brand-new products. Line extensions of strong brands, symbolic brands, brands given strong advertising and promotion support, and those entering earlier into a project sub category are more successful. The size of the company and its marketing competence also display a role (Cohen, Eliashberg and Ho, 1997) Line extensions involve a current brand name which is used to enter a new market segment in its product class.

2.5.2 Recommendation

According to Hutton (1997), the recommendation of the brand to others usually entails great uncertainty for the consumer, even greater than that when buying the brand for himself. Therefore, it is to be expected that the consumer tends to lower this uncertainty by recommending those brands for which he perceives a high guarantee. Westbrook (1987) suggests that consumers will be more inclined to recommend the brand when they associate this brand with highly relevant emotional experiences.

2.5.3 Price premium

Aaker (1996) stated that "a basic indicator of loyalty is the amount a customer will pay for the brand in comparison with another brand offering similar or fewer benefits. This is called the price premium associated with the brand's loyalty, and it may be high or low and positive or negative depending on the two brands involved in the comparison".

The price premium measure is defined with respect to a competitor or a set of competitors, who must be clearly specified. A set of competitors is usually preferred for measurement, because the brand equity of a single competitor can decline while the equity of other competitors remains stable (Aaker, 1996).

Aaker (1996) further suggested that "the price can be determined by simply asking customer how much more they would be willing to pay for the brand".

2.6 Previous Empirical Research

Several studies postulated ideas that serve as the basis for the current study. The empirical evidence has been found for the relationship between brand associations and the consumer response.

A significant study has been made by Rio, Vazquez, and Iglesias (2001) on "The effects of brand associations on consumer response". This experimental study has analyzed the brand image based on the functions or benefits that the consumer associates with the brand. The basic objective was to study the influence of these functions on certain aspects of consumer response capable of generating competitive advantages for the firm. For this, it formulated four hypotheses that relate each of the brand functions with the consumer's willingness to recommend the brand to others, pay a price premium for it and accept brand extensions. The statistics is structural equation model using EQS program. This study found that it is interesting for firms to analyze the different dimensions that make up the brand image. Each of these can have a different incidence on the possible consumer responses that determine the advantages that the brand can provide the firm with. In particular, in the sports shoes market, it has been observed that the association of the brand with the guarantee function favors the recommendation of the brand, the obtaining of a price premium and brand extension to other product categories. In turn, the social identification function has a positive effect on price premium and the acceptance of brand extension. On the other hand, the personal identification and status functions influence recommendation and extension respectively.

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According to Low and Lamb. (2000), "The dimensionality of brand associations" is an experimental and empirical conceptualization of brand associations that consist of three dimensions: brand image, brand attitude and perceived quality. A better understanding of brand associations is needed to facilitate further theoretical development and practical measurement of the construct. Three studies were conducted to test a protocol for developing product category specifically to measure brand image; investigate the dimensionality of the brand associations construct; and explore whether the degree of dimensionality of brand associations varies depending upon a brand's familiarity. The statistics used is confirmatory factor analysis models using LISREL program. Findings confirm the efficacy of the brand image protocol and indicate that brand associations differ across brands and product categories. The latter finding supports the conclusion that brand associations for different products should be measured using different items. As predicted, dimensionality of brand associations was found to be influenced by brand familiarity.

Faircloth, Capella, and Alford (2001) studied "The effect of brand attitude and brand image on brand equity" which operationalizes brand equity and empirically tests a conceptual model adapted from Aaker (1991) and Keller (1993). They considered the effect of brand attitude and brand image on brand equity. There are three variables that are brand attitude, brand image and brand equity. This research used structural equation model by using LISREL program in product consumers would use in making purchase choices of polar fleece sweaters, the experimental product. The results indicated that brand equity can be manipulated at the independent construct level by providing specific brand associations or signals to consumers and that these associations will result in images and attitudes that influence brand equity.

In conclusion, all of these studies explain the effects of brand associations on consumer response. Empirical findings in brand associations on brand image, brand attribute, brand benefits, brand attributes and brand equity indicate interests in customer-based brand equity and brand functions related to the consumer's needs and effect on the consumer response.

This research study is a contribution to creating a better understanding of Thai consumer response in mobile phone. Brand associations and brand functions affect Thai mobile phone market. The conceptual framework used in this research will lead to a better understanding of brand functions (guarantee, personal identification, social identification, and status) of mobile phone effects on consumer response. Therefore, the researcher has concluded and studied dimensions of brand function affecting consumer response in Thai mobile phone market.

CHAPTER 3 RESEARCH FRAMEWORK

This chapter contains four main parts, that is, theoretical framework, modified conceptual framework, research hypothesis and concepts and operational definitions of variables. This research studies the relationship between functions of brand and consumer response of Nokia mobile phone buyers and users. Based on the literatures reviewed in the previous chapter, functions of brand consisting of guarantee, personal identification, social identification, and status are independent variables. Dependent variable is consumer response that is intention to purchase line extension product, recommendation and price premium.

3.1 Theoretical Framework

Brand image is defined as the reasoned or emotional perceptions consumers attach to specific brands (Dobni and Zinkhan, 1990) and is the first consumer brand perception that was identified in the marketing literature (Gardner and Levy, 1955).

Rio, Vazquez and Iglesias (2001) proposed four measuring brand functions through the dimensions of (1) guarantee, (2) personal identification, (3) social identification and (4) status.

Brand associations (Brand image) have a positive influence on consumer choice, preferences and intention of purchase, their willingness to pay a price premium for the brand, accept brand extensions and recommend the brand to others (Park and Srinivasan, 1994; Cobb-Walgren et al., 1995; Agarwal and Rao, 1996; Hutton, 1997; Yoo et al., 2000).

The influence exerted by each of the dimensions of the brand functions on three variables reflect the consumer's willingness to: (1) Accept brand extensions (competitive advantages related to growth potential), (2) Recommend it to others,(3) Pay a price premium for the brand (competitive advantage related to current performance and profitability).

3.2 Modified Conceptual Framework

A modified conceptual framework of dimensions of brand functions is related to consumer response. The relational paths among the constructs are summarized in Figure 3.1.

Figure 3.1: Structural Model: Dimensions of Brand Functions and Consumer Response



Note: This model was adapted from the study of "The effects of Brand Associations on Consumer Response" in Journal of Consumer Marketing (Rio, Vazquez and Iglesias, 2001), P.414. According to the model of dimensions of brand functions and consumer response, the researcher considers dimensions of brand functions to be: (1) guarantee, (2) personal identification, (3) social identification and (4) status. These are independent variables, whereas consumer responses: (1) intention to purchase line extensions product, (2) recommendation of the brand and (3) price premium are dependent variables.

3.3 Research Hypotheses

Based on the conceptual framework presented earlier, a hypothesis is possible answer to the research question (Aaker et al, 1995). Based on the identification of proper variables, the hypotheses are necessary to be conducted to test the relationships between dependent and independent variables to see the validity of the assumption. This will be useful to explore how each independent variable is associated with the dependent and in which direction.

The researcher tests a total of 12 hypotheses for supporting the research objectives. The hypotheses are as shown below:

Hypotheses

Group I: Relationships of the Guarantee Function to Consumer Response

- Ho1: There is no relationship between guarantee and intention to purchase line extensions product.
- Ha1: There is a relationship between guarantee and intention to purchase line extensions product.

Ho2: There is no relationship between guarantee and recommendation.

Ha2: There is a relationship between guarantee and recommendation.

Ho3: There is no relationship between guarantee and price premium.

Ha3: There is a relationship between guarantee and price premium.

Group II: Relationships of Personal Identification to Consumer Response

- Ho4: There is no relationship between personal identification and intention to purchase line extensions product.
- Ha4: There is relationship between personal identification and intention to purchase line extensions product.

Ho5: There is no relationship between personal identification and recommendation. Ha5: There is relationship between personal identification and recommendation.

Ho6: There is no relationship between personal identification and price premium. Ha6: There is relationship between personal identification and price premium.

Group III: Relationships of Social Identification to Consumer Response

- Ho7: There is no relationship between social identification and intention to purchase line extensions product.
- Ha7: There is relationship between social identification and intention to purchase line extensions product.

Ho8: There is no relationship between social identification and recommendation. Ha8: There is relationship between social identification and recommendation.

Ho9: There is no relationship between social identification and price premium. Ha9: There is relationship between social identification and price premium.

Group IV: Relationships of Status to Consumer Response

- Ho10: There is no relationship between status and intention to purchase line extensions product.
- Ha10: There is relationship between status and intention to purchase line extensions product.
Holl: There is no relationship between status and recommendation. Hall: There is relationship between status and recommendation.

Ho12: There is no relationship between status and price premium. Ha12: There is relationship between status and price premium.

3.4 Concepts and Operational Definitions of the Variables

A concept is a generalized idea about a class of objects, attributes, occurrences, or process. An operational definition gives meaning to concept by specifying the activities or operation necessary to measure it. The operational definition specifies what must be done to measure the concept under investigation. It is like a manual of instructions or recipe (Zikmund, 1997).

Operationalization of Dependent Variables

For this research, there are the main dependent variables, which are consumer response: intention to purchase line extension products, recommendation and price premium. Table 3.1 shows the operational definitions of each component for the variables.

Concept	Concept Definition	Operational	Level of	Questions in
	Y	Components	Measurement	Questionnaire
Intention to	To purchase an existing brand	 Buy an existing 	Interval	Question no. 13
purchase line	name extended to new sizes of	brand name		in part II of the
extensions	different versions in the existing	extended to		Questionnaire
product	product category.	different series in		
		the existing		
		product category.		
Recommendation	Recommend to others to buy the	Recommend the	Interval	Question no. 14
	brand.	purchase of the		in part II of the
	NIN	brand		Questionnaire
Price Premium	Willing to pay higher price for	Willing to pay	Interval	Questions no.
	Nokia brand.	higher price		15-16 in part II
				of the
	à NA			Questionnaire

Table 3.1 Operationalization of Consumer Response



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Operationalization of Independent Variables

For this research, the main independent variables are the dimensions of the brand functions: guarantee, personal identification, social identification and status. Table 3.2 shows the operational definitions of each component for the variables.

Concept	Concept Definition	Operational	Level of	Questions in
		Components	Measurement	Questionnaire
Brand	Brand functions are associations	Guarantee	Interval	Questions in
Functions	related to intangible attributes or	 Personal 		part I of the
	images added to the product thanks	Identification		Questionnaire
	to its brand name <mark>, that is, they</mark>	• Social	1	
	represent benefits that can only be	Identification		
	obtained from products with a	Status		
	brand	L		
Guarantee	The promise or guarantee of	Confidence	Interval	Questions no.
	quality, based on the appraisal that	Consumer	2	1-4 in part I of
	the brand is reliable, efficiently	interest	X	the
	carries out its p <mark>erformance qualities</mark>	• Performance	9	Questionnaire
	and meets the generated	quality	*	
	expectations.	• Value-for-		
	ทาวิทยาวั	money		
Personal	Consumers can identify themselves	Respectively	Interval	Questions no.
Identification	with some brands and develop	• To express the		5-6 in part I of
	feelings of affinity towards them.	individual's		the
		self-concept		Questionnaire
		1		

Table 3.2 Operationalization of Dimensions of Brand Functions

Social	The brand's ability to act as a	In Fashion	Interval	Questions no.
Identification	communication instrument allowing	Brand		7-10 in part I of
	the consumer to manifest the desire	reputation		the
	to be integrated.	Acceptance		Questionnaire
		Brand leader		
Status	The feelings of admiration and	Prestige	Interval	Questions no.
	prestige that the consumer may	Distinction		11-12 in part I of
	experience upon using the brand.			Questionnaire



CHAPTER 4 RESEARCH METHODOLOGY

The purpose of this chapter is to provide an overview of the methodology used in this research. The research methodology in this chapter includes the research method, research instrument, source of data, sampling design, pretest, and statistical treatment of data.

4.1 Research Method: Sample Survey

In this research, sample survey will be used as a technique to gather primary data and record people responses for analysis. Sample survey indicates the purpose of contacting respondents to obtain a representative sample of the target population. Survey is a research technique in which information is gathered from a sample of people by use of a questionnaire; a method of data collection based on communication with a representative sample of individuals (Zikmund, 1997).

4.2 Research Instrument

Self-administered questionnaire will be used in this research to gather information from the respondents. Self-administered questionnaire is a questionnaire that is filled in by the respondents rather than the interviewer (Zikmund, 1997). A questionnaire consists of a set of questions presented to respondents for their answers. Because of its flexibility, the questionnaire is by far the most common instrument used to collect primary data (Kotler, 2000). Questionnaires need to be carefully developed, tested, and debugged before they are administered on a large scale. The questionnaire itself will be prepared in English in order to fulfill the requirement of the Assumption University and will be translated into Thai for reducing the responding error and better understanding for the respondents.

4.3 Source of Data

There are two sources of data that is primary data and secondary data.

4.3.1 Primary Data

Primary data is data gathered for a specific purpose or for a specific research project (Kotler, 2000). In this research, primary data will be collected by questionnaires which make it is easy to code and interpret by computer.

4.3.2 Secondary Data

Secondary data are data gathered and recorded by someone else prior to the current project. Secondary data usually are historical and already assembled. The advantage of secondary data is it saves time and at low cost or less expensive than acquiring primary data (Zikmund, 1997). Secondary data in this researcher is collected from a wide variety of textbooks, journals, newspapers, magazines and Internet related to marketing research, consumer behavior, brand management, and mobile phone industry.

4.4 Sampling Design

4.4.1 Definition of Target Population

Zikmund (1997) defined respondents as the persons who answer an interviewer's questions or the persons who provide answers to written questions in self-administered surveys. The target population of this research refers to people who are Nokia mobile phone buyers and users in Bangkok area.

4.4.2 Sampling Method: Non-Probability Sampling

The sampling design of this research is non-probability sampling. In non-probability sampling, the probability of any particular number of the population being chosen is unknown (Zikmund, 1997). In this research, convenience sampling will be used. The convenience sampling is one of the non-probability sampling designs used in this research. Convenience sampling involves collecting information from members of the population who are conveniently available to provide information (Davis and Cosenza, 1988). Therefore, people in Bangkok who are buyers and users of Nokia mobile phone were selected. The basis of selection is based on the researcher's convenience.

4.4.3 Sampling Unit

The sampling unit of this research is the places to select the population for the survey. There are Assumption University, Kasetsart University, Major Cineplex-Ratchayothin, Major Cineplex-Ramkamhaeng, Central-Ladpao, The Mall-Bangkapi, Bic C- Ramkamhaeng, and Tops Supermarket-Kaset. These places were selected for the convenience of the researcher for the survey.

4.4.4 Determining Sampling Size

The sample size may be determined on the basis of mobile phone ownership, the Nokia samples. In this research, the researcher compared the total sales volumes of Nokia mobile phone in Thailand, about 18 millions, to the samples given in the table of Anderson (Table 4.1) based on the expected rate of 95 percent confidence level and 5 percent sampling error. Therefore, the sampling size of 384 sets of questionnaires was chosen.

Population	R	equired sample f	for tolerable error	<u></u>
	5%	4%	3%	2%
100	79	85	91	96
500	217	272	340	413
1,000	277	375	516	705
5,000	356	535	897	1,622
50,000	381	593	1,044	2,290
100,000	382	596	1,055	2,344
1,000,000	384	599	1,065	2,344
25,000,000	384	600	1,067	2,400

 Table 4.1 Theoretical Sample Sizes of different Sizes of Population and a 95 Percent

 Level of Certainty

Source: Anderson, G., Fundamentals of Education Research, 1996, P.202.

4.5 Pre-testing of the Questionnaire

The objective of the pretest is to ensure that the respondents understand the questions. The mistakes in wording, sequencing, and structuring were corrected and adjusted in order to prevent miscommunication between the researcher and respondents and biases. The researcher pretested the data collection tool in order to test the reliability of the questionnaire by distributing 40 copies of questionnaire to the randomly selected respondents for testing. The data were processed by SPSS program to find the reliability. The results showed the coefficient value of 0.7959 for all items.

Determinants	Independent Variables	Item-Total
	•	Correlation
1. Guarantee	Confidence	.1708
	Consumer interest	.5934
	Performance quality	.4009
	Value-for-money	.2767
2. Personal identification	Respectively	.5082
	• To express the individual's self-	.5010
	concept	
3. Social identification	In Fashion	.4020
	Brand reputation	.5146
4	Acceptance	.1416
<u>S</u>	Brand leader	.0783
1.0		2/0/
4. Status	• Prestige	.3027
	• Distinction	.6078
Determinants	Dependent Variables	Item-Total
S S	ROTHERS	Correlation
5. Intention to purchase	Buy an existing brand name	.5317
line extensions product	A extended to new sizes in the existing product category.	
6. Recommendation	Recommend the purchase of the	.7321
	(Brand) กลัยอัสลิม	
7. Price premium	Willing to pay higher price	.5415
	• To make decision to pay for the new	.0317
	brand	
All items	Cronbach's α	0.7959

Table 4.2 The value of reliability analysis (For Pre-testing)

From the results of reliability analysis test as appears in Table 4.2, Cronbach's alpha values for all variables are greater than 0.6. It means that all measurement scales are relatively reliable.

4.6 Statistical Treatment of Data

The data analysis will be accomplished with the SPSS program (Statistical Package for the Social Sciences), which is used for finding the reliability. Structural equation modeling (SEM) examines the overall fit of the data to the hypothesized model and offers advantages over traditional regression techniques by taking measurement unreliability into account when estimating the relationships among variables. In this research, the research hypotheses are tested with SEM using LISREL. A Measurement model was set to have seven factors (latent variables) and 16 items. The data were processed by SPSS program to find the reliability

Structural equation modeling (SEM) is one of the most popular and powerful analyses of data in the behavioral sciences. The explosive growth in the application of SEM is due to many advantages over traditional analysis techniques. For instance, SEM makes it possible to simultaneously estimate a measurement model, specifying relations between measured variables and underlying latent variables, and to specify structural relations among the latent variables. The impressive flexibility of SEM allows the researcher to model data structures, which violate traditional model assumptions such as heterogeneous error variances and correlated errors. In addition, the common software packages used to perform structural equation modeling provide model fit indices which can be used to assess the fit of a hypothesized model to the sample data¹⁰.

10 http://www.aom.pace.edu/rmd/1997_forum_structural_equation_models_error.html

Structural equation modeling (SEM) grows out of and serves purposes similar to multiple regression, but in a more powerful way which takes into account the modeling of interactions, nonlinearities, correlated independents, measurement error, correlated error terms, multiple latent independents each measured by multiple indicators, and one or more latent dependents also each with multiple indicators. SEM may be used as a more powerful alternative to multiple regression, path analysis, factor analysis, time series analysis, and analysis of covariance. That is, these procedures may be seen as special cases of SEM, or, to put it another way, SEM is an extension of the general linear model (GLM) of which multiple regressions is a part¹¹.

The structural equation modeling process centers around two steps: validating the measurement model and fitting the structural model. The former is accomplished primarily through confirmatory factor analysis, while the latter is accomplished primarily through path analysis with latent variables. One starts by specifying a model on the basis of theory. Each variable in the model is conceptualized as a latent one, measured by multiple indicators. Several indicators are developed for each model, with a view to winding up with at least three per latent variable after confirmatory factor analysis. Based on a large (n>100) representative sample, factor analysis (common factor analysis or principal axis factoring, not principle components analysis) is used to establish that indicators seem to measure the corresponding latent variables, represented by the factors. The researcher proceeds only when the measurement model has been validated. Two or more alternative models (one of which may be the null model) are then compared in terms of "model fit," which measures the extent to which the covariances predicted by the model correspond to the observed covariances in the data. "Modification indexes" and other coefficients may be used by the researcher to alter one or more models to improve fit¹².

¹¹www2.chass.ncsu.edu/garson/pa765/structur.htm

¹²www2.chass.ncsu.edu/garson/pa765/structur.htm

Advantages of SEM compared to multiple regression include more flexible assumptions (particularly allowing interpretation even in the face of multicollinearity), use of confirmatory factor analysis to reduce measurement error by having multiple indicators per latent variable, the attraction of SEM's graphical modeling interface, the desirability of testing models overall rather than coefficients individually, the ability to test models with multiple dependents, the ability to model mediating variables, the ability to model error terms, the ability to test coefficients across multiple between-subjects groups, and ability to handle difficult data (time series with auto correlated error, non-normal data, incomplete data)¹³.

An additional advantage of SEM over more traditional regression analyses is the focus of this presentation. When presenting SEM results, the fact that the estimated relationships among latent variables are not biased due to unreliability in the construct indicators is commonly presented as a major advantage over competing analysis techniques (e.g., Hom & Griffeth, 1991; Huba & Harlow, 1987; Kenny & Judd, 1984; Medsker, Williams, & Holahan, 1994; Schaubroeck, Ganster, & Fox, 1992).

LISREL (Linear Structural RELations) is a program for confirmatory factor analysis and structural equation modeling. It is particularly designed to accommodate models that include latent variables, measurement errors, reciprocal causation, simultaneity, and interdependence. In addition, LISREL covers a wide range of models useful in the social and behavioral sciences, including confirmatory factor analysis, path analysis, econometric models for time series data, recursive and non-recursive models for cross-sectional and longitudinal data, and covariance structure models¹⁴.

¹³www2.chass.ncsu.edu/garson/pa765/structur.htm

¹⁴http://tis.tulane.edu/How_To/Unix_System/LISREL_and_PRELIS.cfm

The LISREL model, in its most general form, consists of a set of linear structural equations. Variables in the equation system may be either directly observed variables or unmeasured latent (theoretical) variables that are not observed but relate to observed variables. It is assumed in the model that there is a causal structure among a set of latent variables, and that the observed variables are indicators of the latent variables¹⁵.

The model consists of two parts, the measurement model and the structural equation model:

- The measurement model specifies how latent variables or hypothetical constructs depend upon or are indicated by the observed variables. It describes the measurement properties (reliabilities and validities) of the observed variables.
- The structural equation model specifies the causal relationships among the latent variables, describes the causal effects, and assigns the explained and unexplained variance.
- The LISREL method estimates the unknown coefficients of the set of linear structural equations. It is particularly designed to accommodate models that include latent variables, measurement errors in both dependent and independent variables, reciprocal causation, simultaneity, and interdependence.

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¹⁵ http://www.ssicentral.com/lisrel/define.htm

The method includes as special cases such procedures as

- confirmatory factor analysis,
- multiple regression analysis,
- path analysis,
- economic models for time-dependent data,
- recursive and non-recursive models for cross-sectional / longitudinal data,
- covariance structure models and
- multi-sample analysis.



CHAPTER 5 DATA ANALYSIS

This chapter presents the results from data analysis. The chapter is divided into four major parts as follows:

- Reliability test indicates the strength of the scale used in this research
- Measurement Models
- Results of Hypotheses Testing
- Structural Equation Modeling



5.1 Reliability of the variables

Table 5.1: Reliability Test of Index Scale

Determinants	Independent Variables	Item-Total
		Correlation
1. Guarantee	Confidence	.3266
	Consumer interest	.4902
	Performance quality	.4907
	• Value-for-money	.4535
2. Personal identification	Respectively	.5655
	• To express the individual's self-	.4339
	concept R C	
3. Social identification	In Fashion	.4516
4	Brand reputation	.4390
0	Acceptance	.3688
PT/	• Brand leader	.4657
4. Status	Prestige	.3835
5 🔍	Distinction	.3544
Determinants	Dependent Variables	Item-Total
		Correlation
5. Intention to purchase	• Buy an existing brand name	.3965
line extensions product	extended to new sizes in the existing	
2	product category.	
6. Recommendation	• Recommend the purchase of the	.5762
	brand	
7. Price premium	• Willing to pay higher price	
	• To make decision to pay for the new	.1200
	brand	
All items	Cronbach's α	.8085

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From the results of reliability analysis test as appeared in Table 5.1, Cronbach's alpha value for all seven variables are greater than 0.6. It means that all measurement scales are relatively reliable as the result of Cronbach's alpha value is 0.8085 in all items.

5.2 Measurement Models

The measurement model is that part (possibly all) of a SEM model which deals with the latent variables and their indicators. A pure measurement model is a confirmatory factor analysis (CFA) model in which there is unmeasured covariance (two-headed arrows) between each possible pair of latent variables, there are straight arrows from the latent variables to their respective indicators, there are straight arrows from the error and disturbance terms to their respective variables, but there are no direct effects (straight arrows) connecting the latent variables.

Confirmatory factor analysis (CFA) may be used to confirm that the indicators sort themselves into factors corresponding to how the researcher has linked the indicators to the latent variables. Confirmatory factor analysis plays an important role in structural equation modeling. CFA models in SEM are used to assess the role of measurement error in the model, to validate a multifactorial model, to determine group effects on the factors.

Confirmatory factor analysis

Confirmatory factor analysis was used to test validity and reliability of the scale proposed to measure the brand functions (Anderson and Gerbing, 1988). The LISREL program was employed to assess the overall fit of the research model. Thus, a confirmatory factor analysis was performed with the 12 items proposed to measure the different dimensions of the functions that the consumer perceives of the brand. This model provided satisfactory goodness of fit indices, since the GFI statistics is 0.95.

Model Fit

Model fit determines the degree to which the structural equation model fits the sample data. Model fit criteria commonly used are chi-square (χ^2), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and root-mean-square residual (RMR) (Joreskog & Sorbom, 1989).

Goodness of fit tests determine if the model being tested should be accepted or rejected. These overall fit tests do not establish that particular paths within the model are significant. If the model is accepted, the researcher will then go on to interpret the path coefficients in the model.

Statistics	Recommended Value	Value
Chi-square/df	<3.00	2.86
GFI	>0.90	0.95
AGFI	>0.80	0.91
NFI O	>0.90	0.93
NNFI V	>0.90	0.93
CFI	LABOR >0.90 VIN	0.95

Table 5.2 Goodness of fit Measure of Brand Functions

Table 5.2 shows the goodness-of-fit results. As shown, the model provides an adequate fit to the data. All of the measures surpass the minimum recommended levels.

A Confirmatory factor analysis was performed to estimate the internal dimensionality of the independent variables. This was done to more strongly support the use of formal and informal measures of performance in one model. Dimensions of brand functions are guarantee, personal identification, social identification, and status as independent variables.

Figure: 5.2 Path Coefficients for the Research Model



Notes: Results based on standardized solutions. • represent t-values associated with each coefficient and their respective significance is denoted as +p < 0.05.

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5.3 Hypothesis Testing Results

Figure 5.2 shows the results of hypothesis testing

Group I: Relationship of guarantee function to consumer response

Hypothesis 1 :

- Ho1: There is no relationship between guarantee and intention to purchase line extensions product.
- Hal: There is a relationship between guarantee and intention to purchase line extensions product.

Table 5.3 The analysis of the relationship between guarantee and intention to purchase line extensions product.

Parameter	Standardised estimates	t-values
н	0.025	-0.29
		A Start

The result from the test of Hypothesis 1 in table 5.3, shows that t-value is equal to -0.29, that is greater than -1.96 (-0.29 > -1.96). Therefore, the null hypothesis failed to reject. This means that there is no relationship between guarantee and intention to purchase line extension products.

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If t-values statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) will be rejected.

Hypothesis 2:

Ho2: There is no relationship between guarantee and recommendation.

Ha2: There is a relationship between guarantee and recommendation.

Table 5.4 The analysis of the relationship between guarantee and recommendation.

Parameter	Standardised estimates	t-values
H2	0.30	4.33*

The result from test of Hypothesis 2 in table 5.4 shows that t-value is equal to 4.33, that was greater than 1.96 (4.33 > 1.96). Therefore, the null hypothesis is rejected and the alternative Ha2 is accepted. This means that there is relationship between guarantee and recommendation.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) will be rejected.

For standardised estimates from the test, the value of the standardised estimates is equal to 0.30. This means that there is a positive relationship between guarantee and recommendation of Nokia Mobile Phone at 0.30 or 30 percent.

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Hypothesis 3:

Ho3: There is no relationship between guarantee and price premium.

Ha3: There is a relationship between guarantee and price premium.

Table 5.5 The analysis of the relationship between guarantee and price premium.

Parameter	Standardised estimates	t-values
H3	0.12	1.15

The result from the test of Hypothesis 3 in table 5.5 shows that t-value is equal to 1.15, that was less than 1.96 (1.15 < 1.96). Therefore, the null hypothesis is to be rejected. This means that there is no relationship between guarantee and price premium.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

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Group II: Relationship of Personal Identification to Consumer Response

Hypothesis 4:

- Ho4: There is no relationship between personal identification and intention to purchase line extensions product.
- Ha4: There is relationship between personal identification and intention to purchase line extensions product.

Table 5.6 The analysis of the relationship between personal identification and intention to purchase line extensions product.

Parameter	Standardised estimates	t-values
H4	0.33	5.70*
1		2

The result from the test of Hypothesis 4 in table 5.6 shows that t-value is equal to 5.70, that was greater than 1.96 (5.70 > 1.96). Therefore, the null hypothesis is rejected and the alternatives Ha4 is accepted. This means that there is relationship between personal identification and intention to purchase line extensions product.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

For the standardised estimates from the test, the value of the standardised estimates is equal to 0.33 This means that there is a positive relationship between personal identification and intention to purchase line extension products of Nokia Mobile Phone at 0.33 or 33 percent.

Hypothesis 5:

Ho5: There is no relationship between personal identification and recommendation. Ha5: There is relationship between personal identification and recommendation.

Table 5.7 The analysis of the relationship between personal identification and recommendation.

Parameter	Standardised estimates	t-values
H5	0.29	6.77*
	VERS	S/2

The result from the test of Hypothesis 5 in table 5.7 shows that t-value is equal to 5.70, that was greater than 1.96 (6.77 > 1.96). Therefore, the null hypothesis is rejected and the alternatives Ha4 is accepted. This means that there is relationship between personal identification and recommendation.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

For the standardised estimates from the test, the value of standardised estimates is equal to 0.29 This means that there is a positive relationship between personal identification and recommendation of Nokia Mobile Phone at 0.29 or 29 percent.

Hypothesis 6:

Ho6: There is no relationship between personal identification and price premium.Ha6: There is relationship between personal identification and price premium.

Table 5.8 The analysis of relationship between personal identification and price premium.

Standardised estimates	t-values
0.21	3.36*
WERS	
	Standardised estimates 0.21

The result from the test of Hypothesis 6 in table 5.8 shows that t-values is equal to 3.36, that was greater than 1.96 (3.36 > 1.96). Therefore, the null hypothesis is rejected and the alternatives Ha4 is accepted. This means that there is relationship between personal identification and price premium.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

For the standardised estimates from the test, the value of the standardised estimates is equal to 0.21 This means that there is a positive relationship between personal identification and price premium of Nokia Mobile Phone at 0.21 or 21 percent.

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Group III: Relationship of Social Identification to Consumer Response

Hypothesis 7:

- Ho7: There is no relationship between social identification and intention to purchase line extensions product.
- Ha7: There is relationship between social identification and intention to purchase line extensions product.

Table 5.9 The analysis of the relationship between social identification and intention to purchase line extensions product.

Parameter	Standardised estimates	t-values
H7	0.17	1.94

The result from test of Hypothesis 7 in table 5.9 shows that t-value is equal to 1.94, that was less than 1.96 (1.94 < 1.96). Therefore, the null hypothesis failed to reject. This means that there is no relationship between social identification and intention to purchase line extensions product.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

Hypothesis 8:

Ho8: There is no relationship between social identification and recommendation. Ha8: There is relationship between social identification and recommendation.

Table 5.10 The analysis of the relationship between social identification and recommendation.

Parameter	Standardised estimates	t-values
Н8	0.13	1.79
	NVER.	5/2

The result from the test of Hypothesis 8 in table 5.10 shows that t-value is equal to 1.79, that was less than 1.96 $(1.79 \le 1.96)$. Therefore, the null hypothesis is rejected. This means that there is no relationship between social identification and recommendation.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

* 2199730

Hypothesis 9:

Ho9: There is no relationship between social identification and price premium. Ha9: There is relationship between social identification and price premium.

Table 5.11 The analysis of the relationship between social identification and price premium.

Parameter	Standardised estimates	t-values
Н9	0.044	0.42
	NVER.	517.

The result from the test of Hypothesis 9 in table 5.11 shows that t-value is equal to 0.42, that was less than 1.96 (0.42 < 1.96). Therefore, the null hypothesis failed to reject. This means that there is no relationship between social identification and price premium.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

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Group IV: Relationship of Status to Consumer Response

Hypothesis 10:

- Ho10: There is no relationship between status and intention to purchase line extensions product.
- Ha10: There is relationship between status and intention to purchase line extensions product.

Table 5.12 The analysis of the relationship between status and intention to purchase line extensions product.

Parameter	Standardised estimates	t-values
H10	0.18	3.10*
1		

The result from the test of Hypothesis 10 in table 5.12 shows that t-value is equal to 3.10, that was greater than 1.96 (3.10 > 1.96). Therefore, the null hypothesis is rejected and the alternatives Ha10 is accepted. This means that there is relationship between status and intention to purchase line extensions product.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

For the standardised estimates from the test, the value of the standardised estimates is equal to 0.18. This means that there is a positive relationship between status and intention to purchase line extension products of Nokia Mobile Phone at 0.18 or 18 percent.

Hypothesis 11:

Holl: There is no relationship between status and recommendation.

Hall: There is relationship between status and recommendation.

Table 5.13 The analysis of the relationship between status and recommendation.

Parameter	Standardised estimates	t-values
H11	0.18	3.99*

The result from the test of Hypothesis 11 in table 5.13 shows that t-value is equal to 3.99, that was greater than 1.96 (3.99 > 1.96). Therefore, the null hypothesis is rejected and the alternative Hall is accepted. This means that there is relationship between status and recommendation.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

For the standardised estimates from the test, the value of the standardised estimates is equal to 0.18. This means that there is a positive relationship between status and recommendation of Nokia Mobile Phone at 0.18 or 18 percent.

Hypothesis 12:

Ho12: There is no relationship between status and price premium.

Ha12: There is relationship between status and price premium.

Table 5.14 The analysis of the relationship between status and price premium.

H12 0.15 2.31	Parameter	Standardised estimates	t-values
	H12	0.15	2.31*

The result from the test of Hypothesis 12 in table 5.14 shows that t-value is equal to 2.31, that was greater than 1.96 (2.31 > 1.96). Therefore, the null hypothesis is rejected and the alternatives Ha12 is accepted. This means that there is relationship between status and price premium.

If t-value statistics is less than -1.96 or greater than +1.96 at a 0.05 level of significance, the null hypothesis (Ho) is rejected.

For the standardised estimates from the test, the value of the standardised estimates is equal to 0.15 This means that there is a positive relationship between status and price premium of Nokia Mobile Phone at 0.15 or 15 percent.

5.4 Structural Equation Modeling

The path relationships depicted in Figure 5.1 were further analyzed by structural equation modeling (SEM) using LISREL VIII (Joreskog and Jorbom, 1996). The primary aim of SEM is to explain the pattern of a series of inter-related dependence relationships simultaneously between a set of latent (unobserved) constructs, each measured by one or more manifest (observed) variables. The measured (manifest) variables in SEM have a finite number of values, and these variables are gathered from respondents through data collection methods, or collected as secondary data from a published source. They are represented by numeric responses to a rating scale item on a questionnaire. On the other hand, latent (unobserved) variables are not directly observed, have an infinite number of values, and are usually continuous. In this instance, the latent constructs in the research model are guarantee, personal identification, social identification, and status. Latent variables are theoretical constructs, which can only be determined to exist as a combination of other measurable variables.

Although the primary purpose of SEM is the analysis of latent constructs and in particular the analysis of causal links between latent constructs, SEM is also capable of other forms of analysis. SEM can be used to estimate variance and covariance, test hypotheses using conventional linear regression, and factor analysis (Joreskog and Sorbom, 1996). Moreover, all aspects of SEM must be directed by theory, which is critical for model development and modification, and this is in line with the development process of the research model proposed in this study. Hence, for these reasons, the adoption of SEM for the purposes of statistical analysis is applicable to this research.



Figure: 5.3 Path Coefficients for the Research Model

Consequently, the results for the hypothsised research model are presented in Figure 5.3 and Table 5.15. As presented in Table 5.15, the relevant fit indices for the research model in Figure 5.3 are acceptable. After confirmatory factor analysis was used to test validity and reliability of the scale proposed to measure the brand functions. LISREL program has suggested a correlation with other independent variables (dimensions of brand functions), depicted by a double-headed arrow. There are two added relationships in dependent variables. There is relationship between price premium and intention to purchase line extension products. Finally, recommendation and intention to purchase line extension products have a positive relationship.

Notes: Results based on standardized solutions. * represent t-values associated with each coefficient and their respective significance is denoted as *p < 0.05.

LISREL was used to assess the overall fit of the research model to the data collected through the sample correlation matrix and the relative strengths of individual paths. The estimation method used was the maximum likelihood due to its desirable large sample properties (Bollen, 1989). Chi-square/ degrees of freedom, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), and Comparative Fit Index (CFI) were used as measures for goodness-of-fit. The chi-square statistics was not used owing to its sensitivity to sample size, as pointed out by Hartwick and Barki (1994). The literature suggests that for a good model fit, Chi-square/degrees of freedom should be less than 3.0, GFI, NFI, NNFI, and CFI should be greater than 0.90, and AGFI should be greater than 0.80 (Henry and Stone, 1994; Scott, 1994). These benchmarks were used here to assess the model.

Table 5.15 : Fit indices of the research model

Statistic	Recommended Value	Research Model		
5		Value		
Chi-square/df	<3.00	1.08		
GFI	>0.90			
AGFI	ABOR >0.80			
NFI	>0.90	ף		
NNFI	>0.90 _{CE1969}	302 I		
CFI	· · · · · · · · · · · · · · · · · · ·	1		

Table 5.15 shows the goodness-of-fit results. As shown, the model provides an adequate fit to the data. All of the measures surpass the minimum recommended levels. As presented in Table 5.15, the relevant fit indices for the research model in Figure 5.3 are acceptable.

Parameter Path	Standardised estimates	t-values
H1 Guarantee \rightarrow intention to purchase	-0.025	-0.29
line extensions product		
H2 Guarantee \rightarrow recommendation	0.30	4.33*
H3 Guarantee \rightarrow price premium	0.12	1.15
H4 Personal identification \rightarrow intention to pure	chase 0.33	5.70*
line extensions p	roduct	
H5 Personal identification \rightarrow recommendation	n 0.29	6.77*
H6 Personal identification \rightarrow price premium	RC / ^{0.21}	3.36*
H7 Social identification \rightarrow intention to purchase	ase 0.17	1.94
line extensions proc	luct	
H8 Social identification \rightarrow recommendation	0.13	1.79
H9 Social identification \rightarrow price premium	0.044	0.42
H10 Status \rightarrow intention to purchase line	0.18	3.10*
extensions product		
H11 Status \rightarrow recommendation	0.18	3.99*
H12 Status \rightarrow price premium	SI GABRIO.15	2.31*

Table : 5.16 Parameter Estimates for Structural Equation

The results of the SEM for the research model in Figure 5.3 are presented in Table 5.16.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of research results for the study. There are three parts that is the research findings to answer the research problem providing general results of hypotheses. Then it has recommendations about customer's perception of the brand on mobile phone industry. And last part is suggestions for the further study.

6.1 Conclusions and Summary of Hypothesis Test

According the statement of problem, the researcher focused on studying the relationship between functions of brand and consumer response. The statement of problem is stated as " What is the relationship between functions of brand and response of Nokia mobile phone buyers and users in Bangkok?"

There are seven variables and twelve hypotheses in this research.

Hypothesis	Statistic	Standardised	t-values	Results
	LA Test	estimates No	T	
H1 : Guarantee \rightarrow intention	SEM	-0.025	-0.29	Failed to
to purchase line extensions	(LISREL)	NCE1969	alers.	reject Ho
product	. จุมธ	າລັຍอัสลง		
H2 : Guarantee \rightarrow	SEM	0.30	4.33*	Rejected Ho
recommendation	(LISREL)			
H3 : Guarantee \rightarrow price	SEM	0.12	1.15	Failed to
premium	(LISREL)			reject Ho
H4 : Personal identification	SEM	0.33	5.70*	Rejected Ho
\rightarrow intention to purchase line	(LISREL)			
extensions product				

Table 6.1 Summary of the results from each hypothesis testing
H5: Personal identification	SEM	0.29	6.77*	Rejected Ho
\rightarrow recommendation	(LISREL)		i	
H6 : Personal identification	SEM	0.21	3,36*	Rejected Ho
→ price premium	(LISREL)	-		
H7 : Social identification \rightarrow	SEM	0.17	1.94	Failed to
intention to purchase line	(LISREL)			reject Ho
extensions product				
H8 : Social identification \rightarrow	SEM	0.13	1.79	Failed to
recommendation	(LISREL)			reject Ho
H9 : Social identification \rightarrow	SEM	0.044	0.42	Failed to
price premium	(LISREL)	EDO		reject Ho
H10 : Status \rightarrow intention to	SEM	0.18	3.10*	Rejected Ho
purchase line extensions	(LISREL)		0	
product			~	
H11 : Status \rightarrow	SEM	0.18	3.99*	Rejected Ho
recommendation	(LISREL)		Set :	
H12 : Status \rightarrow price	SEM	0.15	2.31*	Rejected Ho
premium	(LISREL)			

The summary of the results of hypothesis testing is shown in Table 6.1. Table 6.1 shows all the seven variables in the twelve hypotheses. There are five hypotheses that failed to reject the null hypotheses and seven hypotheses that rejected the null hypotheses.

Conclusions

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The summary of the results of hypothesis testing shown in table 6.1 confirms that seven hypotheses from twelve hypotheses have statistical relationships. These are divided into four groups. In the first group, there is relationship only between guarantee function and recommendation (H2). The consumer's perception of the guarantee function is exerted by the brand. The consumers are more willing to recommend the brand to the others. There are no relationships between guarantee function and intention to purchase line extensions product and price premium. The

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consumers are not perceived to have intention to purchase line extension products and price premium.

In the second group, the results indicated the relationship between personal identification functions to consumer response. It means that person identification is related to increasing the consumer's willingness to purchase line extensions product (H4), recommendation for the brand (H5), and pay a price premium for the brand (H6).

In the third group, the results show that there are no relationships between social identification functions and consumer response. It means that the social identification is not related to variables of acceptance of intention to purchase line extensions product (H7), recommendation for the brand (H8), and pay a price premium (H9). Therefore, the consumers do not give importance to the social identification function, but the consumers give more interest to personal identification than social identification.

For the last group, there is relationship between status function and consumer response. The results indicated that there are relationships between status of brand acceptance from the consumers to purchase line extension products (H10), recommendation of the brand to others (H11), and consumer's willingness to pay a price premium (H12).

Finally, the results from the analyses show that from the four dimensions of brand functions: guarantee, personal identification, and status correlate with consumer's perception. They influence the consumers to be more willing to purchase line extensions product, recommendation the brand to the others and pay a price premium for the brand.

6.2 Recommendations and Implications

The overall findings show that guarantee, personal identification, and status functions have relationship with consumer response. The researcher recommends to Nokia Mobile phone company the following aspects of brand functions of Nokia mobile phone's buyers and users.

Guarantee function

From the buyer's point of view, the basic purpose of a guarantee is to reduce the risk that product purchased will not perform as it should. Essentially, a guarantee is an assurance made by the seller at the time of the sale with respect to the quality of goods sold. According to the research results, most respondents are satisfied with the guarantee offered by Nokia Mobile Phone Company. The respondents have perceived the quality and have been assured of the guarantee from Nokia mobile phone. After the respondents have had good experiences with Nokia, they will be willing to recommend the brand to others. Therefore, the researcher suggests that the company might give guarantee or warranty coverage to customers to assure them of their products and the company should also give services after sales to maintain and attract the customers.

Personal Identification Function

The personal identification function is related to the fact that consumers can identify themselves with some brands and develop feelings of affinity towards them. The overall image that a person holds of him or her is referred to as that individual's selfconcept. According to the research result, most respondents have given more importance to personal identification. Consumers tend to protect and defend their selfimages and buy products and services to enhance them. Then personal identification influence exerted on the consumer willingness to purchase line extensions product, recommend it to others and pay a price premium. Therefore, the researcher suggests that Nokia mobile phone company should separate the target market with a specific self-image segment with the task of positioning their products to that segment. Selfproduct, self-brand, and self-store congruence occur. An understanding of congruence helps marketers in the areas of market segmentation, and advertising. Markets can be segmented in terms of groups of people that exhibit similar self-images and seek products or services to express that image. Successful campaigns build a brand image that is consistent with the self-concept of the desired target market.

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Status Function

The status function expresses the feelings of admiration and prestige that the consumer may experience upon using the brand. Goods serves as social tools or symbols by which individuals disclose something about themselves to others. According to the research results, most respondents are interested in the status brand of Nokia mobile phone. Status influence exerts on the consumers willingness to purchase line extensions product, recommend it to others and pay a price premium. Therefore, the researcher recommends that the company recognize that status brands have relationship with consumer response. The Company should develop the strength of brand name and differentiate itself from the competitors and make the consumers gain value from the brand.

The suggestions might be appropriate for some groups because this research follows up only the target population of Nokia mobile phone buyers and users in Bangkok. The researcher recommends that manufacturers continuously build brand image, develop their quality of product and provide differentiate products by adding more features and functions to meet the consumer's need. The manufacturer should give more importance to the guarantee coverage of the product and services after sales. The manufacturer should develop their brand. Because brands greatly influence consumer's perception and consumer 's buying decision, creating, developing, implementing and maintaining successful brands are frequently at the heart of marketing strategy (Chernatony, 1998).

Furthermore, the marketer should offer different services strategy from competitors to find new customers and maintain their customers.

6.3 Suggestions for Further Research

The results of this study provide some understanding of brand functions relating to consumer response of Nokia's mobile phone buyers and users in Bangkok. This research focused only on the dimensions of brand functions (guarantee, personal identification, social identification, and status) and consumer response. However, there are many interesting points to study about brands (brand value) brand, marketing factors and market strategy influencing consumer behavior. The results may not be generalizable to the people living outside Bangkok because this research collected the information from people who live in Bangkok only. The results may not be generalizable to all buyers and users' of mobile phone in the market because only Nokia mobile phone was selected for study in this research.

There are many differentiations of products in the market segmentation (low, middle, upper market). Therefore, the results may not be generalizable to cover all markets. Nokia mobile phone has many series and price ranges in the market. Therefore, the results may not be generalizable to all models and all markets.

Finally, this research studied Nokia mobile phone producers. Therefore, future research should be based on other brands or all brands in the market. The operators of services are important in the mobile phone industry and they have close relationship with the mobile phone manufacturers. A study should be made of both markets together.

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Questionnaire

Dear Respondent,

This questionnaire research is the part of Master Degree thesis in MBA program at Assumption University. A following questionnaire is design to gather the information on the relationship between functions of brand and response of Nokia mobile phone's buyers and users in Bangkok area. It consists of two parts: Part I: Brand functions and Part II: Consumer response. Your information is very useful for this research. Please select \times choice to all items in this research.

Thank you very much for your cooperation Ms. Monliga Sutthipongkoon

Are you buyers and users of Nokia mobile phone in Bangkok?
 O Yes
 O No (Interview closed)

5 = Strongly agree 4 = Agree 3 = Neutral

= Disagree

2

1 = Strongly disagree

No.	Statement	Strongly	Agree N	leutrall	Disagree	Strongly
		Agree				Disagree
		5	4	3	2	1
	Part I: Brand Functions					
1	Brand Nokia is concerned about continuously improving the performance qualities of the mobile phone.	5	4	3	. 2	1
2	Brand Nokia is very trustworthy.	5	4	3	2	1
3	Brand Nokia mobile phone is of excellent quality.	5	4	3	2	1
4	Brand Nokia give the best value-for-money.	5	4	3	2	1
5	You particularly like brand Nokia mobile phone.	5	4	3	2	1
6	Nokia is a brand totally in line with your lifestyle.	5	4	3	2	1
7	Brand Nokia mobile phone is in fashion.	5	4	3	2	1
8	Your friends have brand Nokia mobile phone.	5	4	3	2	1
9	Brand Nokia mobile phone a good reputation.	5	4	3	2	1
10	Nokia is brand leader.	5	4	3	2	1
11	Using a brand Nokia mobile phone is a social status	5	4	3	2	1
	symbol.			5		
12	Brand Nokia mobile phone have famous presenters to	5	RIE4	3	2	1
	advertise the product.			6	1	
	Part II - Consumer Response					
13	Do you intend to purchase of Nokia mobile phone	5	4	*	2	1
1.5	such as Nokia photograph or Nokia digital camera	969	19163	5	2	
	phone, Nokia music, and Nokia colour screen?	อิลิต	0-			
14	You would advice other people to buy Brand Nokia	5	4	3	2	1
	mobile phone.			0	-	-
15	Do you want to buy Nokia mobile phone? If Brand	5	4	3	2	1
	Nokia mobile phone have the higher price for you	-	·			
	would be willing to pay for them					
	would be winning to puy for menn.					
16	Imagine that in your next purchase you observe a brand	5	4	3	2	1
	that you have never heard of before, whose mobile					
	phone is apparently similar to Brand Nokia mobile					
	phone. Do you want to buy that mobile phone?					

แบบสอบถาม

เรียน ท่านผู้ตอบแบบสอบถาม

แบบสอบถามชุดนี้ได้จัดทำขึ้นเพื่อรวบรวมข้อมูลที่ใช้ในการวิจัย และเป็นส่วนหนึ่งของวิทยานิพนธ์ของนักศึกษา ปริญญาโท สาขาบริหารธุรกิจ มหาวิทยาลัยอัสสัมขัญ (ABAC) โดยได้ทำการศึกษาและทำการวิจัยในหัวข้อ การ ้ศึกษาอิทธิพลของความเกี่ยวข้องของแบรนด์ที่มีต่อการตอบสนองของผู้บริโภค ที่ใช้โทรศัพท์มือถือยี่ห้อ Nokia ที่ อาศัยอยู่ในเขตกรุงเทพมหานคร แบบสอบถามชุดนี้แบ่งออกเป็น 2 ส่วน คือ ส่วนที่ 1 ความเกี่ยวข้องของแบรนด์ที่มี ต่อผู้ที่ใช้โทรศัพท์มือถือยี่ห้อ Nokia และ ส่วนที่ 2 การตอบสนองของผู้บริโภคที่ใช้โทรศัพท์มือถือยี่ห้อ Nokia ข้อมูลของทำนมีประโยชน์ต่อรายงานเล่มนี้มาก โปรด X ลงในคำตอบที่ท่านต้องการ

> ขอขอบพระคุณเป็นอย่างสูงที่ท่านได้ให้ความร่วมมือในการตอบแบบสอบถาม นส. มลลิกา สุทธิพงษ์คุณ

> > O ไม่ใช่ (ปิดการสัมภาษณ์)

- ้คุณเป็นผู้ใช้หรือผู้ซื้อโทรศัพท์มือ<mark>ถือยี่ห้อโนเกีย</mark> (Nokia) ในเขตกรุ<mark>งเทพมหานค</mark>รใช่หรือไม่ O 11
 - เห็นด้วยอย่างยิ่ง 5 เห็นด้วย 4 เฉยๆ 3 ไม่เห็นด้วย 2 ไม่เห็นด้วยอย่างยิ่ง 1

ร้อ	ช้อความ	เห็นด้วย	เห็นด้วย	เฉยๆ	ไม่เห็นด้วย	ไม่เห็นด้วย
		อย่างยิ่ง				เป็นอย่างยิ่ง
	<mark>ส่วนที่ 1 Brand Functions</mark>					
1	ข้าพเจ้าคิดว่าโทรศัพท์มือถือยี่ห้อ Nokia มีการปรับปรุง	5	4	3	2	1
	คุณภาพอยู่อย่างต่อเนื่อง					
2	ข้าพเจ้าคิดว่าโทรศัพท์มือถือยี่ห้อ Nokia มีความน่าเชื่อถือ	5	4	3	2	1
3	ข้าพเจ้าคิดว่า Nokia เป็นโทรศัพท์มือถือที่มีคุณภาพ	5	4	3	2	. 1
4	ข้าพเจ้ารู้สึกว่าคุ้มค่ากับเงินที่ซื้อโทรศัพท์มือถือยี่ห้อ Nokia	5	4	3	2	1
	มาใช้					
5	ข้าพเจ้าคิดว่าข้าพเจ้าขอบโทรศัพท์มือถือยี่ห้อ Nokia	5	4	3	2	1
	เป็นพิเศษ	FRC				
6	ข้าพเจ้ารู้สึกว่าโทรศัพท์มือถือยี่ห้อ Nokia เป็นส่วนหนึ่ง	5	4	3	2	1
	ของการดำรงชีวิต			0		
7	ข้าพเจ้าคิดว่า Nokia เป็นโทรศัพท์มือถือที่ทัน <mark>สมัย</mark>	5	4	3	2	1
8	เพื่อนๆ ของข้าพเจ้าก็ใช้โทรศัพท์มือถือยี่ห้อ Nokia	5	4	3	2	1
9	ข้าพเจ้าคิดว่า Nokia เป็นโทรศัพท์มือถื <mark>อที่มีชื่อเสียง</mark>	5	4	3	2	1
10	ข้าพเจ้าคิดว่า Nokia เป็นผู้นำทางการต <mark>ลาด</mark> เรื่อง 🛛 🔶	5	4	3	2	1
	โทรศัพท์มือถือ 📃 🌅				5	
11	ข้าพเจ้ารู้สึกว่าการใช้โทรศัพท์มือถือยี่ห้ <mark>อ Nokia</mark>	5	GARIEL	3	2	1
	สามารถแสดงถึงฐานะทางสังคมได้				0	
12	ข้าพเจ้าคิดว่าโทรศัพท์มือถือยี่ห้อ Nokia ใช้พรีเช้นเต <mark>อร์</mark>	5	4	3	2	1
	ที่มีชื่อเสียงในการโฆษณาสินค้า	CF1060		2		
	ส่วนที่ 2 Consumer response	2000	รลั ^{มข}	0.0		
13	ข้าพเจ้าคิดว่าข้าพเจ้ามีความสนใจที่จะซื้อโทรศัพท์มือถือ	5	4	3	2	1
	ยี่ห้อ Nokia รุ่นที่มีกล้องถ่ายรูปดิจิตอล, สามารถพังเพลง,					
	เป็นจอสี					
14	ข้าพเจ้าคิดว่าจะแนะนำคนอื่นๆ ให้ซื้อโทรศัพท์มือถือยี่ห้อ	5	4	3	2	1
	Nokia					
15	ข้าพเจ้าคิดว่าข้าพเจ้าจะซื้อโทรศัพท์มือมือถือยี่ห้อ Nokia	5	4	3	2	1
	ถึงแม้ว่าราคาของ Nokia จะสูงสำหรับข้าพเจ้า					
16	ถ้าคุณกำลังคิดที่จะซื้อโทรศัพท์มือถือใหม่ แล้วมีโทรศัพท์	5	4	3	2	1
	มือถือยี่ห้อหนึ่งที่คุณไม่เคยรู้จักมาก่อน ซึ่งเหมือนโทรศัพท์					
	มือถือยี่ห้อ Nokia อย่างเห็นได้ชัด ข้าพเจ้าคิดว่าข้าพเจ้า					
	จะซื้อโทรศัพท์มือมือถือยี่ห้อนั้น					

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Reliability

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****** Method 1 (space saver) will be used for this analysis ******

RE	LIABI	LITY	ANALYSI	IS - SCA	ALE (ALPHA)
			Mean	Std Dev	Cases
1.	V1.1		4.1250	.7228	40.0
2.	V1.2		4.0500	6775	40.0
3.	V1.3		3.9250	.7299	40.0
4.	V1.4		3.4250	.8130	40.0
5.	V2.1		3,7250	.9055	40.0
6.	V2.2		2.9750	1.1433	40.0
7.	V3.1		3.8500	.7355	40.0
8.	V3.2		4.1250	.8224	40.0
9.	V3.3		4.2500	.5883	40.0
10.	V3.4		4.1750	.7472	40.0
11.	V4.1		3.2250	. 9997	40.0
12.	V4.2		3.2500	.8397	40.0
13.	V 5		4.0750	.7299	40.0
14.	V6		3.4000	.8102	40.0
15.	V7.1		3.1000	.8412	40.0
16.	V7.2		2.6750	.9711	40.0
				N	of
Stati	stics for	Mean	Variance	Std Dev Vari	ables
	SCALE	58.3500	43.2011	6.3733	10
Ttem-1	total Stati	stics			
A. S. 15111	cocur ocucr				
	s	cale	Scale	Corrected	
	M	lean	Variance	Item-	Alpha
	if	Item	if Item	Total	if Item
	De	leted	Deleted	Correlation	Deleted
V1.1	54	.2250	41.1019	.1708	.7991
V1.2	54	.3000	37.8051	.5934	ABRIEL.7736
V1.3	54	1,4250	39.0199	.4009 5	.7849
V1.4	54	.9250	<mark>39</mark> .7122	.2767	.7933
V2.1	54	.6250	36.8045	. 5082	,7760
V2.2	55	.3750	35.1122	.5010	.7766
V3.1	54	.5000	< 38,9744	. 4020	.7848
V3.2	54	.2250	37.3583	.5146	.7763
V3.3	54	.1000	41.7846	SINC141969	.7991
V3.4	54	.1750	41.8917	.0783	8052
V4.1	55	.1250	37.7532	.3627	7885
V4.2	55	.1000	36.3487	60782 0	.7689

37.8968

35.4846 36.9615

41.8660

.5317

.7321

.5415

.0317

. .7764

.7601

.8149

54.2750

54.9500

55.2500

55.6750

V5

V7.1

V7.2

V6

Reliability Coefficients

N of Cases = 40.0

N of Items = 16

Alpha = .7959



Rellability

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****** Method 1 (space saver) will be used for this analysis ******

RE	LIABI	LITY ANALYS	IS – S	BCALE (1	агрна)
		Mean	Std Dev	Cases	
1.	V1.1	4.1575	.5818	400.0	
2.	V1.2	4.0475	.6215	400.0	
3.	V1.3	4.1400	.5927	400.0	
4.	V1.4	3,7075	.7371	400.0	
5.	V2.1	3.7925	.8463	400.0	
6.	V2.2	3.1300	.9248	400.0	
7.	V3.1	3,9300	. 6213	400.0	
8.	V3.2	4.0350	.7000	400.0	
9.	V3.3	4.2525	.5784	400.0	
10.	V3.4	3,9150	.7274	400.0	
11.	V4.1	3.0425	.9071	400.0	
12.	V4.2	3.0875	.6900	400.0	
13.	V5	3.7200	.8357	400.0	
14.	V6	3.4850	.6789	400.0	
15.	V7.1	3.5250	.9909	400.0	
16.	V7.2	3,0750	.9959	400.0	
			-	Nof	
Stati	stics for	Mean Variance	Std Dev	Variables	0
	SCALE	59.0425 38.6774	6.2191	16	

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
V1.1	54.8850	36,0569	.3266	.8033
V1.2	54.9950	34.7017	. 4902	,7943
V1.3	54,9025	34,8902	. 4907	BRIEL . 7947
V1.4	55.3350	34.2233	.4535 5	.7953
V2.1	55.2500	32.5038	.5655	.7864
V2.2	55.9125	33.1978	.4339	.7969
V3.1	55.1125	34.9723	.4516	.7964
V3.2	55.0075 🚽 🐋	34.5739	. 4390	.7965
V3.3	54,7900	35.7904	.3688	.8012
V3.4	55,1275	34.1867	SINC.465760	.7946
V4.1	56.0000	33,8095	.3835	.8008
V4.2	55.9550	35.2962	-3544	.8017
V5	55.3225	34.1088	3965	.7993
V6	55.5575	33.6759	.5762	7882
V7.1	55.5175	32.6112	.4493	.7961
V7.2	55.9675	36.2471	.1200	.8240

RELIABILITY ANALYSIS - SCALE (ALPHA)

Reliability Coefficients N of Cases = 400.0

N of Items = 16

Alpha = .8085



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V4.2

0.02

LISREL 8.54

ΒY

Karl G. Jöreskog & Dag Sörbom

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The following lines were read from file C:\WINDOWS\Desktop\ABAC_Nokia\CFA\CFA.SPJ:

CFA BRAND FUNCTIONS Raw Data from file 'C:\WINDOWS\Desktop\ABAC Nokia\CFA\NOKIA.psf' Sample Size = 400Latent Variables V1 V2 V3 V4 Relationships V1.1 = V1V1.2 = V1 $v_{1.3} = v_{1}$ V1.4 = V1V2.1 = V2V2.2 = V2V3.1 = V3 V3.2 = V3V3.3 = V3v3.4 = v3V4.1 = V4V4.2 = V4Path Diagram End of Problem Sample Size = 400 CFA BRAND FUNCTIONS Covariance Matrix V1.4 v1.1 V1.2 V1.3 V2.1 V2.2 ---------V1.1 0.34 0.39 V1.2 0.15 0.35 v1.3 0.13 0.19 0.54 0.20 V1.4 0.14 0.20 0.13 0.21 0.21 0.28 0.72 v2.1 0.86 v2.2 0.00 0.06 0.11 0.12 0.30 0.11 0.16 0.19 V3.1 0.10 0.13 0.11 V3.2 0.08 0.11 0.10 0.09 0.14 0.12 V3.3 0.06 0.10 0.11 0.10 0.09 0.07 0,11 0.07 0.11 0.17 V3.4 0.09 0.15 0.06 0.06 0.14 0.28 V4.1 0.01 0.07

0.03

0.07

0.05

0.09

0.13

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Covariance Matrix

	V3.1	V3.2	V3.3	V3.4	V4.1	V4.2
V3.1	0.39					
V3.2	0.14	0.49				
V3.3	0.13	0.18	0.33			
/3.4	0.13	0.15	0.16	0.53		
74.1	0.15	0.13	0.05	0.18	0.82	
V4.2	0.07	0.09	0.04	0.12	0.27	0.48

CFA BRAND FUNCTIONS

Number of Iterations = 9

LISREL Estimates (Maximum Likelihood)

Measurement Equations

V1.1 = 0.31*V1, Errorvar.= 0.24 , RO = 0.28 (0.030) (0.019)10.32 12.73 V1.2 = 0.44*V1, Errorvar.= 0.19 , RU = 0.50(0.030)(0.018)14.52 10.51 $V1.3 = 0.44 \times V1$, Errorvar = 0.16 , RD = 0.54 (0.029)-(0.016)15.24 9.86 V1.4 = 0.47*V1, Errorvar.= 0.33 , RD = 0.40 (0.037) (0.028)12.67 11.74 V2.1 = 0.71*V2, Errorvar.= 0.21 , RD = 0.71 (0.061) (0.074)2.80 11.69 V2.2 = 0.42*V2, Errorvar.= 0.68 , RD = 0.21 -(0.054) (0.053) 7,93 12.51 , RD = 0.36 V3.1 = 0.37*V3, Errorvar.= 0.25 (0.033)(0.022) 11.33 11.26 9101 RD = 0.34 $V3.2 = 0.41 \times V3$, Errorvar. = 0.32 1 (0.037)(0.028)10.89 11.58 V3.3 = 0.36*V3, Errorvar.= 0.20 , $R\square$ = 0.39 (0.031)(0,019) 11.74 10.98 $V3.4 = 0.42 \times V3$, Errorvar.= 0.36 , RD = 0.33 (0.039)(0.030) 10.65 11.73 V4.1 = 0.68*V4, Errorvar.= 0.35 , RD = 0.57 (0.075) (0.092) 9.12 3.87 V4.2 = 0.39*V4, Errorvar.= 0.32 , $R\Box = 0.33$ (0.049) (0.037)8.09 8.67

Correlation Matrix of Independent Variables

	V1	V2	V3	V4
V1	1.00			
V2	0.67 (0.06) 10.99	1.00		
V3	0.65 (0.05) 12.83	0.52 (0.07) 7.82	1.00	
V4	0.21 (0.07) 2.98	0.35 (0.07) 4.83	0.47 (0.07) 6.73	1.00

Goodness of Fit Statistics

Degrees of Freedom = 48 Minimum Fit Function Chi-Square = 144.93 (P = 0.00) Normal Theory Weighted Least Squares Chi-Square = 137.20 (P = 0.00) Estimated Non-centrality Parameter (NCP) = 89.20 90 Percent Confidence Interval for NCP = (57.96 ; 128.10)

Minimum Fit Function Value = 0.36 Population Discrepancy Function Value (F0) = 0.22 90 Percent Confidence Interval for F0 = (0.15; 0.32) Root Mean Square Error of Approximation (RMSEA) = 0.068 90 Percent Confidence Interval for RMSEA = (0.055; 0.082) P-Value for Test of Close Fit (RMSEA < 0.05) = 0.013

Expected Cross-Validation Index (ECVI) = 0.49 90 Percent Confidence Interval for ECVI = (0.42; 0.59) ECVI for Saturated Model = 0.39 ECVI for Independence Model = 5.01

Chi-Square for Independence Model with 66 Degrees of Freedom = 1975.31 Independence AIC = 1999.31 Model AIC = 197.20 Saturated AIC = 156.00 Independence CAIC = 2059.21 Model CAIC = 346.95 Saturated CAIC = 545.33

> Normed Fit Index (NFI) = 0.93 Non-Normed Fit Index (NNFI) = 0.93 Parsimony Normed Fit Index (PNFI) = 0.67 Comparative Fit Index (CFI) = 0.95 Incremental Fit Index (IFI) = 0.95 Relative Fit Index (RFI) = 0.90

> > Critical N (CN) = 203.85

Root Mean Square Residual (RMR) = 0.033 Standardized RMR = 0.056 Goodness of Fit Index (GFI) = 0.95 Adjusted Goodness of Fit Index (AGFI) = 0.91 Parsimony Goodness of Fit Index (PGFI) = 0.58

	The Modifica	ation Indice	s Suggest t	o Add the
Path	to from	Decrease i	n Chi-Squar	e New Estimate
V1.4	V2		8.3	0.18
V2.1	V1	3	3.0	1.73
V2.1	V4	3	2.2	-0.61
V2.2	V1	3	3.0	-1.02
V2.2	V4	3	2.2	0,36
V3.1	V2		9.5	0.14
V3.3	V2	1.	0.6	-0.14
V3.3	V4	1	6.9	-0.17
The Mo	dification I	ndices Sugge	st to Add a	n Error Covariance
Betwe	en and	Decrease i	n Chi-Squar	e New Estimate
V2.1	V1.4		9.8	0.07
V2.2	V1.1		8.9	-0.07
V3.1	V2.2	1	8.1	0,10
V3.3	V3.2	1	0.4	0.06
V4.1	V2.2	1	8.2	0.15

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DATE: 11/ 7/2003 TIME: 12:23

LISREL 8.54

BY

Karl G. Jöreskog & Dag Sörbom

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The following lines were read from file C:\WINDOWS\Desktop\ABAC Nokia\CFA\CFA.LPJ:

```
TI CFA BRAND FUNCTIONS
DA NI=12 NO=400 NG=1 MA=KM
RA FI='C:\WINDOWS\Desktop\ABAC_Nokia\CFA\NOKIA.psf'
SE
1 2 3 4 5 6 7 8 9 10 11 12 /
MO NX=12 NK=4 LX=FU,FI PH=SY,FR TD=DI,FR
LK
V1 V2 V3 V4
FR LX(1,1) LX(2,1) LX(3,1) LX(4,1) LX(5,2) LX(6,2) LX(7,3) LX(8,3) LX(9,3)
FR LX(10,3) LX(11,4) LX(12,4)
PD
OU
```

TI CFA BRAND FUNCTIONS

Number of Input Variables 12Number of Y - Variables 0Number of X - Variables 12Number of ETA - Variables 0Number of KSI - Variables 4Number of Observations 400

TI CFA BRAND FUNCTIONS

Covariance Matrix V1.2 V1.4 V2.1 V2.2 V1.1 V1.3 ----------------------------1.00 V1.1 V1.2 0.42 1.00 0.53 1.00 V1.3 0.38 0.43 0.47 1.00 V1.4 0.33 V2.1 0.27 0.40 0.41 0.44 1.00 1.00 0.01 0.20 0.17 0.38 V2.2 0.11 V3.1 0.30 0.26 0,35 0.24 0.31 0.34 0.25 0.25 0.18 0.23 0.18 V3.2 0.20 V3.3 0.18 0.27 0.31 0.23 0.18 0.13 V3.4 0.20 0.33 0.25 0.21 0.28 0.11 0.11 0.09 0.18 0.33 V4.1 0.03 0.12 V4.2 0,05 0.17 0.07 0.09 0.15 0.20

Covariance Matrix

	V3.1	V3.2	V3.3	V3.4	V4.1	V4.2
V3.1	1,00					
V3.2	0.33	1.00				
V3.3	0.37	0.44	1.00			
V3.4	0.29	0.30	0.38	1.00		
V4.1	0.27	0.20	0.10	0.27	1.00	
V4.2	0.15	0.19	0.10	0.23	0.43	1.00

TI CFA BRAND FUNCTIONS

Parameter Specifications

LAMBDA-X



TI CFA BRAND FUNCTIONS

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Number of Iterations = 9

LISREL Estimates (Maximum Likelihood)

LAMBDA-X

	V1	V2	¥3	V4		
V1.1	0.53 (0.05) 10.32	-	ex			
V1.2	0.71 (0.05) 14,52		Na Lo	112 22		
V1.3	0.74 (0.05) 15.24		1407 - 1400	w		
V1.4	0.63 (0.05) 12.67			The day		
V2.1		0.84 (0.07) 11.69	UNIV	ERSI	TY	
V2.2		0.45 (0.06) 7.93		** **	2	2
V3.1	~ ~	NP.	0.60 (0.05) 11.26			HA
V3.2		SU	0.58 (0.05) 10.89	± ofs		LA
V3.3	atr (41	Sa .	0.62 (0.05) 11.74	51 S1 G		0V
V3.4		*- ~	0.57 (0.05) 10.65	ICE1969	: 1916J	K
V4.1			139181	0.75 (0.08) 9.12	9.24	
V4.2	** *	· ••		0,57 (0.07) 8,09		

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	V1	V2	٧3	V4		
V1	1.00					
V2	0.67 (0.06) 10.99	1.00				
٧3	0.65 (0.05) 12.83	0.52 (0.07) 7.82	1.00			
V4	0.21 (0.07) 2.98	0.35 (0.07) 4.83	0.47 (0.07) 6.73	1.00		
THE	ETA-DELTA					
	V1.1	V1.2	V1.3	V1.4	V2.1	V2.2
	0.72 (0.06) 12.73	0.50 (0.05) 10.51	0.46 (0.05) 9.86	0.60 (0.05) 11.74	0.29 (0.10) 2.80	0.79 (0.06) 12.51
THE	TA-DELTA		AL.		14	0
	V3.1	V3.2	v3.3	V3.4	V4. 1	V4.2
	0.64 (0.06) 11.33	0.66 (0.06) 11.58	0.61 (0.06) 10.98	0.67 (0.06) 11.73	0.43 (0.11) 3.87	0.67 (0.08) 8.67
Squ	ared Multi	ple Correlat	ions for X	- Vari <mark>ables</mark>		
	V1.1	V1.2	v1.3	V1.4	V2.1	V2.2
	0.28	0.50	0.54	0.40	0.71	0.21
Squ	ared Multi	ple Correlat	io <mark>ns</mark> for X	- Variables		0
	V3.1	V3.2 📩	V3.3	V3.4	V4.1	¥V4.2
	0.36	0.34	0.39	SIN 0:23196	0.57	0.33
			138	ายาลังเล้	ลลี่มะ	

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Goodness of Fit Statistics

Degrees of Freedom = 48Minimum Fit Function Chi-Square = 144.93 (P = 0.00) Normal Theory Weighted Least Squares Chi-Square = 137.20 (P = 0.00) Estimated Non-centrality Parameter (NCP) = 89.20 90 Percent Confidence Interval for NCP = (57.96 ; 128.10)

Minimum Fit Function Value = 0.36 Population Discrepancy Function Value (F0) = 0.22 90 Percent Confidence Interval for FO = (0.15; 0.32)Root Mean Square Error of Approximation (RMSEA) = 0.068 90 Percent Confidence Interval for RMSEA = (0.055 ; 0.082) P-Value for Test of Close Fit (RMSEA < 0.05) = 0.013

Expected Cross-Validation Index (ECVI) = 0.49 90 Percent Confidence Interval for ECVI = (0.42 ; 0.59) ECVI for Saturated Model = 0.39ECVI for Independence Model = 5.01

Chi-Square for Independence Model with 66 Degrees of Freedom = 1975.31 Independence AIC = 1999.31Model AIC = 197.20Saturated AIC = 156.00

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Independence CAIC = 2059.21 Model CAIC = 346.95 Saturated CAIC = 545.33

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Normed Fit Index (NFI) = 0.93 Non-Normed Fit Index (NNFI) = 0.93 Parsimony Normed Fit Index (PNFI) = 0.67 Comparative Fit Index (CFI) = 0.95 Incremental Fit Index (IFI) = 0.95 Relative Fit Index (RFI) = 0.90

Critical N (CN) = 203.85

Root Mean Square Residual (RMR) = 0.056 Standardized RMR = 0.056 Goodness of Fit Index (GFI) = 0.95 Adjusted Goodness of Fit Index (AGFI) = 0.91 Parsimony Goodness of Fit Index (PGFI) = 0.58

Time used: 0.853 Seconds



DATE: 11/ 7/2003 TIME: 12:45 .

LISREL 8,54

BY

Karl G. Jöreskog & Dag Sörbom

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The following lines were read from file C:\WINDOWS\Desktop\ABAC_Nokia\MODEL2\MODEL2.SPJ:

MODEL2 Raw Data from Sample Size = Relationships V5 = V6 V7 V5 = V1 V2 V3 V6 = V1 V2 V3 V7 = V1 V2 V3 Path Diagram End of Problem	file 'C:\WI 400 V4 V4 V4 v4	NDOWS\Desk	top\ABAC_Noki		NOKIA.psf'	THA
Sample Size =	400					
MODEL2	Sc					5
Covar	lance Matrix					2
	V5	V6	V7	V1	V2	V3
V5	0.70	LA	BOR	VIN		
V6	0.25	0.46			*	
V7	-0.03	0.12	0.73			
V1	0.09	0.13	0.03INC	0.2369		
V2	0.27	0.25	0.16	0.14	0.54	
V3	0.12	0.11	0.06	0.10	0.13	0.22
∨4	0.18	0.16	0.11	0,05	0.16	0.10

Covariance Matrix



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```
MODEL2
Number of Iterations = 0
LISREL Estimates (Maximum Likelihood)
       Structural Equations
     V5 = 0.33*V6 - 0.21*V7 - 0.025*V1 + 0.33*V2 + 0.17*V3 + 0.18*V4, Errorvar.= 0.47 , R2 = 0.33
         (0.062) (0.042) (0.087) (0.058) (0.088) (0.057)
                                                                             (0.033)
          5.33
                   ~5.02
                             -0.29
                                        5.70
                                                  1.94
                                                           3.10
                                                                               14.05
     V6 = 0.30*V1 + 0.29*V2 + 0.13*V3 + 0.18*V4, Errorvar.= 0.31 , R2 = 0.33
          (0.069)
                   (0.044) (0.071) (0.045)
                                                          (0.022)
                    6.77
                             1.79
          4.33
                                       3.99
                                                           14.05
     V7 = 0.12*V1 + 0.21*V2 + 0.044*V3 + 0.15*V4, Errorvar.= 0.66 , R2 = 0.086
         (0.10)
                   (0.064)
                           (0.10)
                                      (0,066)
                                                           (0.047)
          1.15
                    3.36
                             0.42
                                                           14.05
                                        2.31
       Reduced Form Equations
     V5 = 0.049*V1 + 0.38*V2 + 0.20*V3 + 0.20*V4, Errorvar.= 0.53, R2 = 0.24
                             (0.093) (0.059)
2.18 3.44
         (0.090)
                    (0.057)
                                                .
          0.54
                     6.63
     0.31, R2 = 0.33
                                                              ~
                   6.77
     V7 = 0.12*V1 + 0.21*V2 + 0.044*V3 + 0.15*V4, Errorvar. = 0.66, R2 = 0.086
                   (0.064)
                                       (0.066)
          (0.10)
                             (0.10)
          1.15
                    3.36
                              0.42
                                        2.31
       Covariance Matrix of Independent Variables
                           v2
                                     173
                V1
                                                VA
             ____
                                  -----
     V1
              0.23
            (0.02)
             14.05
              0.14
     V2
                        0.54
            (0.02)
                       (0.04)
                        14.05
              7.32
             .0.10
                        0,13
                                   0.22
     V3
                       (0.02)
                                  (0.02)
            (0.01)
              8.28
                         6.82
                                  14.05
              0.05
                        0.16
                                  . 0.10
                                              0.46
     V4
                       (0.03)
                                  (0.02)
                                            (0.03)
            (0.02)
              2.80
                        5.97
                                   6.10
                                             14.05
       Covariance Matrix of Latent Variables
```

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	V5	V6	V7	V1	V2	¥З
V5	0.70					
V6	0.26	0.46				
V7	-0.04	0.10	0.73			
V1	0.09	0.13	0.07	0.23		
V2	0.27	0.25	0.16	0.14	0.54	
V3	0.12	0.11	0.06	0.10	0.13	0.22
V4	0.18	0.16	0.11	0.05	0.16	0.10

	V4
	_ ~ ~ ~ _ ~ ~ ~ ~ ~
V4	0.46

Goodness of Fit Statistics

Degrees of Freedom = 1 Minimum Fit Function Chi-Square = 1.08 (P = 0.30) Normal Theory Weighted Least Squares Chi-Square = 1.08 (P = 0.30) Estimated Non-centrality Parameter (NCP) = 0.083 90 Percent Confidence Interval for NCP = (0.0 ; 7.21)

Minimum Fit Function Value = 0.0027 Population Discrepancy Function Value (F0) = 0.00021 90 Percent Confidence Interval for F0 = (0.0 ; 0.018) Root Mean Square Error of Approximation (RMSEA) = 0.015 90 Percent Confidence Interval for RMSEA = (0.0 ; 0.14) P-Value for Test of Close Fit (RMSEA < 0.05) = 0.50

Expected Cross-Validation Index (ECVI) = 0.14 90 Percent Confidence Interval for ECVI = (0.14 ; 0.16) ECVI for Saturated Model = 0.14 ECVI for Independence Model = 2.26

Chi-Square for Independence Model with 21 Degrees of Freedom = 880.52 Independence AIC = 894.52 Model AIC = 55.08 Saturated AIC = 56.00 Independence CAIC = 929.46 Model CAIC = 189.85 Saturated CAIC = 195.76

> Normed Fit Index (NFI) = 1.00 Non-Normed Fit Index (NNFI) = 1.00 Parsimony Normed Fit Index (PNFI) = 0.048 Comparative Fit Index (CFI) = 1.00 Incremental Fit Index (IFI) = 1.00 Relative Fit Index (RFI) = 0.97

> > Critical N (CN) = 2441.25

Root Mean Square Residual (RMR) = 0.0048 Standardized RMR = 0.0082 Goodness of Fit Index (GFI) = 1.00 Adjusted Goodness of Fit Index (AGFI) = 0.98 Parsimony Goodness of Fit Index (PGFI) = 0.036

Time used: 0.922 Seconds

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DATE: 11/ 7/2003
                                   TIME: 12:45
                                 LISREL 8.54
                                        BY
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The following lines were read from file C:\WINDOWS\Desktop\ABAC_Nokia\MODEL2\MODEL2.LPJ:
TI MODEL2
DA NI-7 NO-400 NG-1 MA-KM
RA FI='C:\WINDOWS\Desktop\ABAC Nokia\MODEL2\NOKIA.psf'
SE
5671234/
MO NX=4 NY=3 BE=FU, FI GA=FU, FI PH=SY, FR PS=DI, FR
FR BE(1,2) BE(1,3) GA(1,1) GA(1,2) GA(1,3) GA(1,4) GA(2,1) GA(2,2) GA(2,3)
FR GA(2,4) GA(3,1) GA(3,2) GA(3,3) GA(3,4)
PD
ΟŪ
TI MODEL2
                           Number of Input Variables
                                                        7
                           Number of Y - Variables
Number of X - Variables
                                                        3
                                                        4
                           Number of ETA - Variables
                                                        3
                           Number of K<mark>SI - Variables</mark>
                                                        4
                           Number of Observations
                                                      400
TI MODEL2
        Covariance Matrix
                  V5
                             v6
                                                                            ₩3
               1.00
      ٧5
      ٧6
               0.44
                           1.00
      v7
               -0.05
                           0.21
                                       1.00
      V1.
               0.24
                           0.40
                                       0.17
                                                   1.00
      V2
               0.44
                           0,49
                                       0.26
                                                   0.40
                                                              1.00
      ٧3
               0.30
                           0.36
                                       0.16
                                                   0.46
                                                              0.37
                                                                          1.00
                                                              0.31
                                                                          0.32
      ν4
               0.31
                           0.34
                                       0.20
                                                  0.14
        Covariance Matrix
                 V4
                 ν4
               1.00
        Means
                                         V7
                                                                            V3
                  ٧5
                             Vő
                                                     V1
                                                                V2
                                         ----
                                                    ------
                                                                سہ دند ہے
                                                                           ____
                 ---
                3.72
                           3.48
                                       3.30
                                                   4.01
                                                              3,46
                                                                          4.03
        Means
                 V4
            3.06
```

Page 4

TI MODEL2

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Page 5

GAMMA

	· V1	V2	V3	V4
V5	-0.01	0.29	0 10	0 14
	(0.05)	(0.05)	(0.05)	(0.05)
	~0.29	5.70	1.94	3.10
V6	0.21	0.32	0.09	0.18
	(0.05)	(0.05)	(0.05)	(0.04)
	4.33	6.77	1.79	3.99
V7	0.06	0.19	0.02	0.12
	(0.06)	(0.06)	(0.06)	(0.05)
	1.15	3.36	0.42	2.31

Covariance Matrix of Y and X

	V5	V6	V7	V1	V2	V3
	~~~~					
V5	1.00					
V6	0.45	1.00				
V7	-0.06	0.17	1.00			
V1	0.24	0.40	0.17	1.00		
V2	0.44	0.49	0.26	0.40	1.00	
V3	0.30	0.36	0.16	0,46	0.37	1.00
V4	0.31	0,34	0.20	0.14	0.31	0.32

Covariance Matrix of Y and X

V4 V4 1.00

14	1.00		
Mean	Vector	of	Eta-Variables

V7	V6	V5
3.30	3.48	3.72

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	V1	V2	V3	V4
V1	1.00	*		
	(0,07)			
	14.05		N2200	SINCEIS
V2	0.40	1.00	(13)	10- 0
	(0.05)	(0.07)		′ฃาลยล
	7.32	14.05		
٧3	0.46	0.37	1.00	
	(0.06)	(0.05)	(0.07)	
	8.28	6.82	14.05	
V4	0.14	0.31	0.32	1.00
	(0.05)	(0.05)	(0.05)	(0.07)
	2.80	5.97	6.10	14.05

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Note: This matrix is diagonal.

<b>V</b> 5	V6	٧7
·····		~~~~~
0.67	0.67	0.91
(0.05)	(0.05)	(0.07)
14.05	14.05	14.05

Squared Multiple Correlations for Structural Equations

V5	V6	V7
0.33	0.33	0.09

## Squared Multiple Correlations for Reduced Form

V7	V6	<b>V</b> 5
0.09	0.33	0.24

## Reduced Form

	V1	V2	V3	V4
V5	0.03	0.34	0.11	0.16
	(0.05)	(0.05)	(0.05)	(0.05)
	0.54	6.63	2.18	3.44
V6	0.21	0.32	0.09	0.18
	(0.05)	(0.05)	(0.05)	(0.04)
	4.33	6.77	1.79	3.99
۷7	0.06	0.19	0.02	0.12
	(0.06)	(0.06)	(0.06)	(0.05)
	1 15	3.36	0 42	2 31




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