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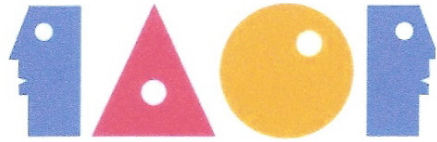
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INNOVATIVE CAPACITY AS A MODERN FACTOR OF COUNTRIES INVESTMENT ATTRACTIVENESS DYNAMIC

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Abstract

One of the most important features of the modern world economic is an increasing of the main productive factors intellectualization. The national economies innovative potential, abilities to develop the innovative industries, to increase the innovative production consumption determine the national economies competitiveness, the prospects of growth, economic independence and prosperity.

The study considers the methods for innovative capacity determining and national innovation strategies forming; includes the conclusions about the correlation of national economic systems investment attractiveness and its innovative potential, recommendations about further economical progress of the countries with different features of their innovative potential.

Keywords: Innovative potential, innovative industry, investment attractiveness, innovation potential's assessment, innovative modernization, innovative-investment process

Introduction

The features of traditional productive factors (primarily, the capital) markets functioning determines a modern trend of the global economic interactions modernization. National economical systems innovative modernization has an increasing impact on the processes of international capital movements. In the same time, the mechanisms of international market of capital provide the indispensable resource for innovative progress and the strong infrastructure for innovations commercialization.

In view of relationships between the international capital movement and innovation development processes deepening, of necessity to determine the dependence between the countries investment attractiveness and their innovative potential, the study of resources ensuring the innovation progress is relevant.

The purpose of the study is, based on analysis of features of the modern innovative-investment process, of the international investment role in the national innovative system progress, to determine the direction of the economy qualitative growth by providing a resource base and effective tools for its innovative modernization.

This purpose achieving provides a logical sequence of the following tasks:

- to highlight the rules and principles of the modern nation innovative systems functioning;
- to define the role of international investment in the global trend of innovative modernization;

- to offer the methodology for innovative potential and investment attractiveness of the modern states assessment;
- to characterize the correlation between countries innovative potential and investment attractiveness in the conditions of globalizing economy;
- to define the direction of national innovative systems development in the countries which are differ by their innovative potential and investment attractiveness criteria.

The object of the study are the globalizing economic processes, which are characterized by the factors of production intellectualization, by the deepening of integration of financial and innovation spheres, by the formation of transnational constructs for innovations transfers.

Theoretical and Methodological Bases

The principles of national innovative systems development were offered by Castells, M., Lundvall, B., Naisbitt, J., Nelson, P., North, D., Penrose, E., Chesbrough, H., Weinstein, H., Inozemtsev, Laktionov, A. The compilation of international experience of national economic modernization on the innovative basis was made by Gompers, P., Ceyncross, F., Vasiliev, J., Ivanov, N. The problems of the financial sector functioning in context of the economic globalization and business internationalization were investigated by McCartney, P. Northcott, D., Samuelson, P., Porter, M.

The theoretical and methodological basis of the study is provided by the conceptual approach of classical political economy, Marxist Economic Theory, the neoclassical school and Institutional Economics. Were used the provisions of the systems approach and systems analysis, and the economic research methods: economic and statistical groups, modeling, typological clustering and logical design.

Main Focus

The countries investment attractiveness as a factor of the foreign investors decision making is known in economic theory and practice for more than three decades. However, the methods of its calculation, made by authoritative international organizations, do not include the estimates the national economic systems real size, do not represent the branch of investment objects and use the figures, which characterize only the international movement of capital.

This allows us to offer the alternative methodology, which is based on the real indexes of domestic investment role in the national economic system functioning. This index – the internal investment attractiveness of the country – shows how attractive the country for own, internal investors, have they any willing for foreign investments realizing or ready to invest within their economic model? For counting this index were used the complex of macroeconomic criteria such as capital investment in the basic means of production, base lending rate at commercial banks, the indexes of inbound and outbound investment flows, which relation allows to estimate the

real size of internal investment in the country. The countries ranking, according to the criterion of their internal investment attractiveness is presented in Table 1.

Table 1. Index of internal investment attractiveness (IIA) in countries of the world, 2009

№	Country	Capital investment in the basic means of production, % of GDP	The base lending rate at commercial banks	Index of internal investment attractiveness	№	Country	Capital investment in the basic means of production, % of GDP	The base lending rate at commercial banks	Index of internal investment attractiveness
1	Belgium	21,3	6,98	79,7	11	Tunisia	23,6	15,1	57
2	Singapore	24,9	5,33	73,25	12	China	40,4	7,47	54,86
3	Ireland	25,3	6,52	72,39	13	Kazakhstan	29,7	11,2	54,36
4	Bulgaria	29,8	10,1	65,36	14	Chili	20,6	8,76	53,99
5	Qatar	46,1	7,43	61	15	UAE	21,8	13,9	52,85
6	Latvia	31,6	11	59,2	16	Cyprus	20,8	6,74	52,22
7	Hungary	20,9	9,01	58,96	17	Portugal	21,7	7,92	52
8	Vietnam	40,1	11,2	58,96	18	Romania	28,1	13,35	51,88
9	Czech	24,1	5,79	58,72	19	Hong-Kong	20,3	6,75	51,28
10	Brazil	17,6	44	57,84	20	Lithuania	26,6	6,86	50,95
65	Russia	21,1	10,1	25,68	81	Sweden	18,9	4,1	11,9
77	Germany	18,3	5,96	18,01	82	Norway	20,7	6,65	7,73
78	Finland	20,3	5,7	13,99	83	Panama	20,1	8,25	5,91
79	UK	18,5	5,52	12,59	84	Netherlands	20,1	8,72	2,12
80	Kuwait	21,4	8,54	12,12	85	N. Zealand	23,1	12,83	1,31

As we can see, the countries with a high investment potential (New Zealand, Scandinavian countries, Great Britain) have lower internal investment attractiveness (IIA). As well as states with rapidly growing economies, low-cost production resources and liberal financial regulations get high rates of IIA.

The factors, determining the level of country innovative capacity, are the state educational system, the most of the population integration into the global information environment, the transparency of the process of innovation projects development and selection, and the degree of intellectual property rights protection [Freeman, 1995].

The analysis of the countries innovative environment (Table 2.) demonstrates a clear leadership of USA, the Northern and Western Europe countries, Israel and Japan. Among the first forty countries are also ones which are implementing the national strategy of innovation (Eastern Europe; Thailand, Malaysia, Brazil), or which are the innovations receptors (UAE, Mexico, Argentina and Chile).

The Figure. 1 analysis allows making some conclusions about the degree of correlation between the IP and IIA of the country. First of all, the high innovative potential of the country does not determine its high internal investment attractiveness with a high probability.

The most of innovative progress and world economy leaders (primarily U.S. and European countries) occupy a position in zone C (low level of IIA), the same time zone B on the

Table 2. Index of the innovative environment (IE) in the countries of the world, 2009¹

№	Country	Index of the innovative environment ²	№	Country	Index of the innovative environment
1	USA	5,534297	21	Portugal	1,857662
2	Norway	3,991143	22	Spain	1,627437
3	Finland	3,772009	23	Czech	1,595924
4	Netherlands	3,718114	24	Hungary	1,565178
5	Denmark	3,7075	25	UAE	1,526444
6	Switzerland	3,322986	26	Slovenia	1,466053
7	Sweden	3,304393	27	Greece	1,462987
8	Australia	3,104374	28	Poland	1,461955
9	France	2,914291	29	S. Korea	1,440097
10	Austria	2,753734	30	Lithuania	1,360526
11	Belgium	2,709595	31	Slovakia	1,308211
12	New Zealand	2,698199	32	Latvia	1,252573
13	Japan	2,497443	33	Mexico	1,153018
14	Israel	2,360882	34	Argentina	1,098918
15	Singapore	2,329479	35	Chile	1,098316
16	Italy	2,309326	36	Malaysia	1,042383
17	UK	2,202339	37	Thailand	1,039319
18	Germany	2,15879	38	Brazil	1,008358
19	Canada	2,142079	39	Russia	1
20	Ireland	2,047112	40	Bulgaria	0,99549
64	China	0,857978	71	Kenya	0,641883
65	Philippines	0,726034	72	Zimbabwe	0,694397
66	Morocco	0,717312	73	Indonesia	0,598367
67	Egypt	0,716031	74	Cameroon	0,590269
68	Nigeria	0,712279	75	Bangladesh	0,569262
69	Algiers	0,693794	76	Pakistan	0,565399
70	India	0,651639	77	Cot d'Ivoire	0,558253

¹ 77 biggest economies of the world were analyzed. The data of World Bank and World Trade organization was used // www.wto.org, www.wb.org/indexes.

² Comparing with Index of innovative environment of Russia (equal to 1)

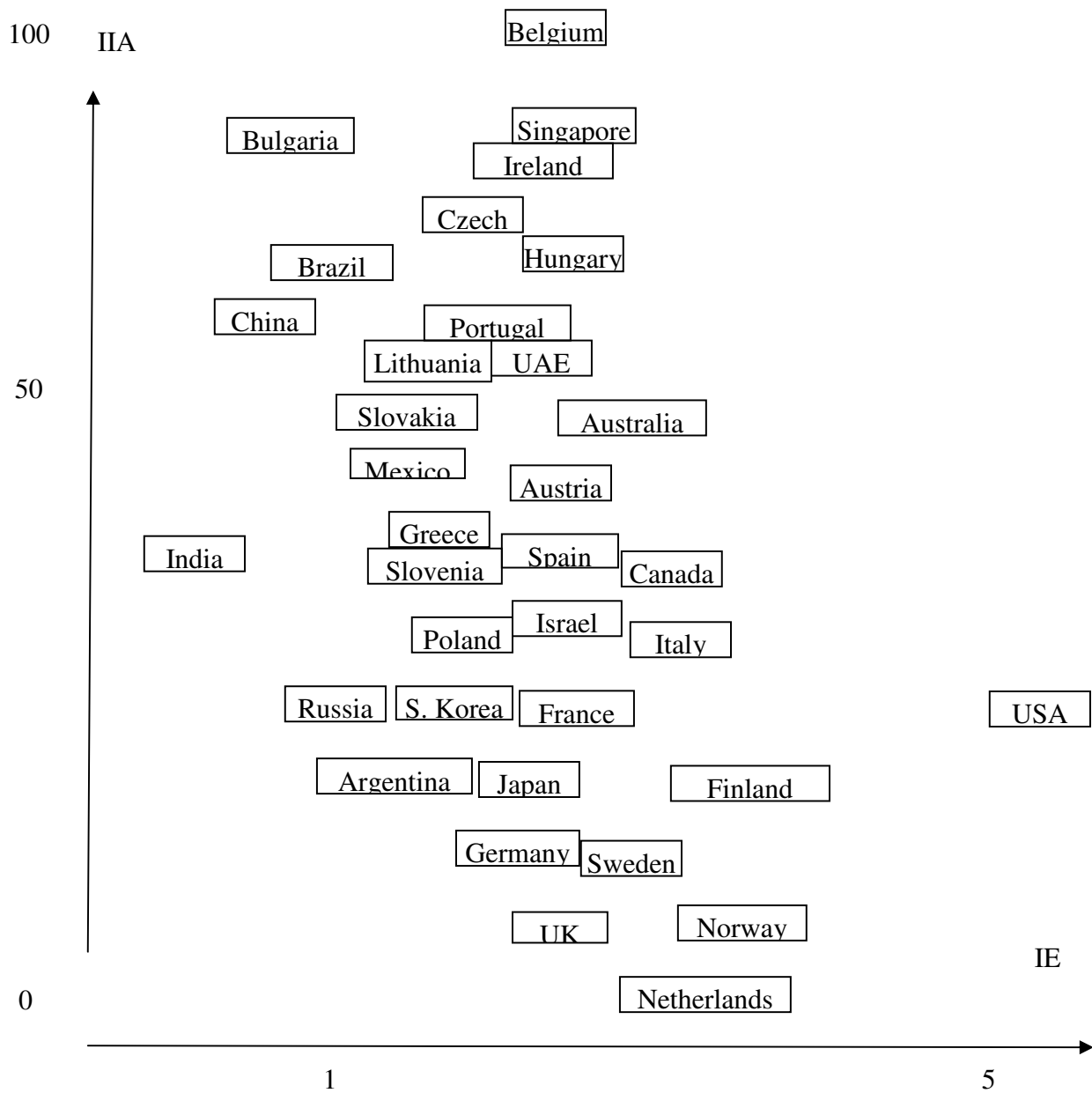


Figure 1. Positioning of countries according to their IIA and IE (1)

Figure. 2. (the country high levels both of IIA and IE) has not got any states. The majority of countries with high IIA are different by their low innovative potential (Zone A). It is obvious, that the domestic investors, who are actively choosing their own economy as an investment object, shall be guided, first and foremost, by the low cost of resources, manpower, rather than by the national economy ability to generate the innovation.

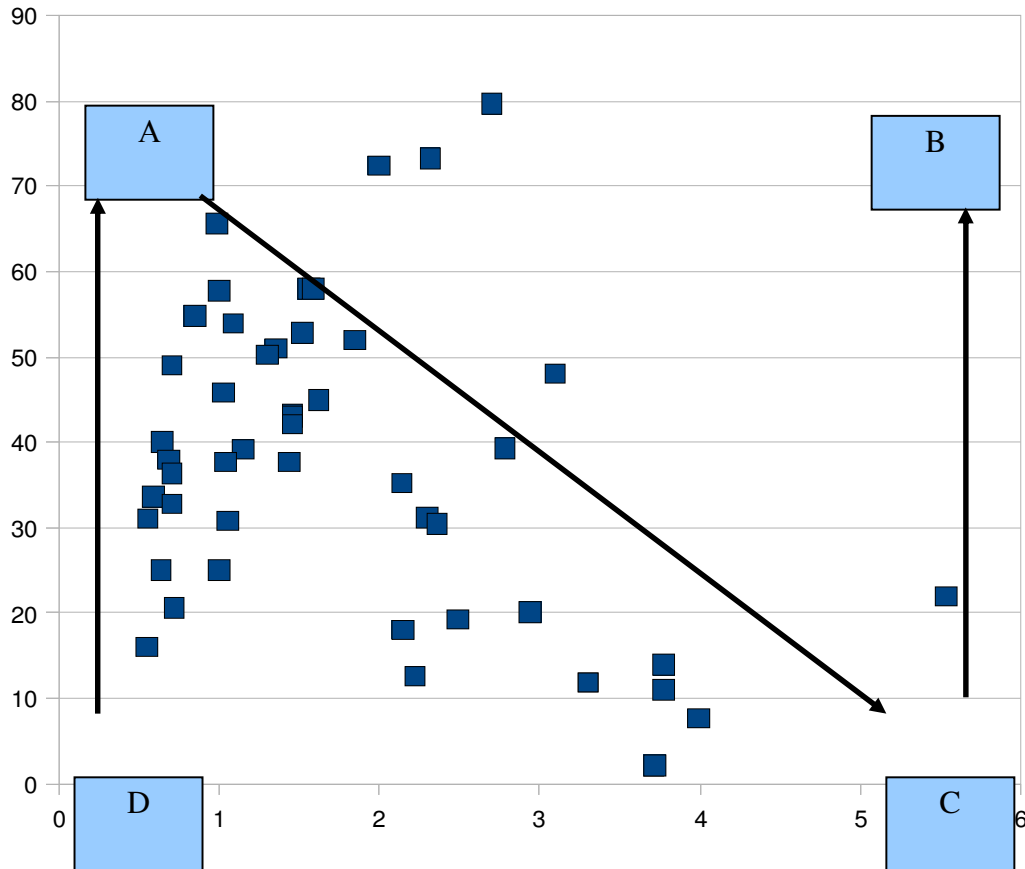


Figure 2 - Positioning of countries according to their IIA and IE (2)

The peripheral development countries occupy zone D. The success of their further development is linked either with the transition to zone A (due to internal investment attractiveness increasing), or to zone C (innovation potential increasing). Because of the innovations now are the highest factor of country competitiveness, which is developing only in the presence of certain infrastructure and of high domestic consumption, the peripheral countries (zone D) progress in the direction of innovative development (zone C) seems unreal. The country development in its positioning in the international division of labor goes according to the arrows in fig. 2 (D-A-C-B).

The reasons of this phases change in the countries economic development are the specificity of innovations as a competitiveness and investment attractiveness factor, and the need to form the conditions for the national innovations generation and commercialization (for example, related infrastructure, high domestic consumption). This certainly will increase the domestic investment attractiveness (the countries transition in zone A) before the country innovative potential raising.

Main problem of the innovative leader's progress in the nearest future – is a feedback between the domestic investors desire to invest in their own economies (IIA) and the innovative advances. The analysis of investments structure in developed countries leads to the several conclusions that explain this phenomenon.

1. Internal investment attractiveness (IIA) of innovative leaders is reducing by the predominance of investments flows to the countries with cheap production factors, primarily labor. The international investment activity implying the forming of capital flows from capital-saturated countries through the transnational production chains and international financial instruments to the labor-saturated countries was described in detail in the twentieth century and continues to be relevant in the modern integration context.

2. Internal investment attractiveness of the innovative leaders is reducing due the innovative companies desire to commercialize the innovations in the economic systems, which are more attractive in terms of productive factors costs, lower levels of business social stress and its social responsibility. As a result, the latest developments, obtained in the innovative countries, are actively coping and using in industrial and commercial activities of developing countries, both by legal (for example, through the technology transfer between the MNC structural affiliates, the licenses and patents purchase) and illegal (the weakness of international information and intellectual property legal protection, the technologies for information storage and transmission development, the data working formats universalization are stimulating it) means.

On the one hand, the innovations transfer in developing nations with their further commercialization there instantly cheapens the innovative product prices, makes its global sales, and increases the economies of scale. On the other hand, the innovations transfer (even the

legal) is a way to limit the innovative leader's capacity which can cut their desire for creativity and new knowledge development. We can not argue with the Bill Gates opinion that the innovative progress will slow down if it would not be based on commercial interests [Gates, 1999].

3. Internal investment attractiveness of the innovative leaders is reducing due their capital-saturation. As has been argued, the state gains the innovative potential only when it has a high domestic consumption, formed by the relevant social, economic and political institutions [Myasnikovich, 2003]. The creating of this economic system requires a high level of national economic system primary sectors development which suggest the national economy capital-saturation, and consequently, the low price of capital as a productive factor.

Guided by their desire to increase the profits and capital return, the entrepreneurs are stepping up its own activities in the field of foreign investment, significantly reducing the investment attractiveness of their own country.

So analyzed the correlation of the IIA and IE of the modern countries we suggest, that the world market, stimulating the transnational entrepreneurship in innovative manufacturing, international technology transfer and new knowledge development, has caused the emergence of "innovative economy failures", which capable to limit the further innovative progress and the innovative capacities of the modern leaders.

For moving to the stage of sustainable development, characterized by the high rates of both IIA and IE, the modern states need to develop and to implement a new principles of public policy (both internal and external), to modernize the traditional stimulus of technological progress, to introduce the differentiated approach in its own foreign trade. As strategic goals of the increasing of innovation and investment processes efficiency in the national innovative systems can be identified the innovations commercialization optimization, the growth of financial and innovative sectors integration in the innovative-investment processes, the government role transformation.

Conclusion

The main result of the study is determining, based on the international investment attractiveness of the modern national innovative systems indicators analysis, the strategic guidance and tactical activities of national economy re-positioning in the structure of international division of labor by the intensification of investment processes in domestic innovative industries. The scientific knowledge increasing includes the following results:

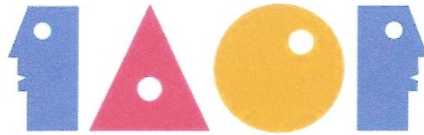
- Based on the macroeconomic and global economic parameters analysis, the method for evaluation the IIA and the innovative environment of countries was proposed. This method using confirms that the cost of factors, which are unrelated to the innovative production, still have a determining role in investment activity;

- Based on innovative capacity and internal investment attractiveness assessment, the classification of the modern national innovative systems within the global economic interactions structure was given. This allows determining the possibility of countries repositioning in the international division of labor, of resistance the failures of innovative economy;
- The role of government in innovative development through the leveling of imbalance between the innovations supply and demand was defined. This allowed developing a set of practical measures to modernize the systems and infrastructure of the innovative economy Government regulation

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An Evaluation OF Entrepreneurship Education in Indonesia:
A Case Study of Bengkulu University

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Abstract

The purpose of this paper is to explore and provide recommendations on entrepreneurship education programs at Bengkulu University, Indonesia. An empirical analysis of data was used to examine student satisfaction with entrepreneurship education at the university, using the SatMan model developed by Abduh, D'Souza, Burley and Quazi (2007). Results identify an

increase in student participation, as well as overall satisfaction with entrepreneurship education. Opportunities were, however, identified in areas of pedagogy and learning materials and resources. Recommendations include a proposal for the establishment of the Centre for Student Entrepreneurship Development (CSED) and Business Incubation Program (BIP). Implications of the research include improvement in resource allocation, student support and overall student satisfaction with entrepreneurship education at the university.

Key words: entrepreneurship, student satisfaction, SatMan model

Introduction

Establishment and growth of new Small and Medium Enterprises (SMEs) has been well regarded a major contributor to the economy of most nations, including Indonesia (Maritz, 2008). The majority of businesses in Indonesia are classified as SMEs, and these businesses have created job opportunities for more than 60% of the labor force of the country and contributed a significant amount to the gross national product (GNP) and tax income. Other significant roles of SMEs have also been well recognized, including stimulating economic competition, promoting innovation, producing goods and services efficiently, and being potential sources or seedbeds for larger enterprises. Small businesses tend to use local resources and produce goods and services for the local or new markets that might be inappropriate and unprofitable to larger companies. These reasons suggest that the more SMEs that are established, the more their contributions to the economy are valued (Abduh, 2009).

The significant roles of entrepreneurship in the economy have inspired universities in Indonesia, including Bengkulu University, to encourage students to become entrepreneurs by providing entrepreneurship education to university students. Furthermore, this goes hand in hand with the objectives of entrepreneurship education programs, including entrepreneurial self-efficacy and intentionality (Franco, Haase, & Lautenschlager, 2010). The purpose of the provision of entrepreneurship education includes introducing entrepreneurship to students and motivating students/graduates to be self-employed and thus creating job opportunities. The rationale of the programs rests on the notion that the more people create their own employment, the less their dependency on the employment market and hence the unemployment rate is assumed to decrease (Neck & Greene, 2011).

Currently, many universities in Indonesia, including Bengkulu University, have promoted a number of entrepreneurship development and education programs aimed at encouraging university students to be self-employed (Abduh, 2008; Sapri, 2003; Universitas Bengkulu, 2006). Bengkulu University offered its students the entrepreneurship course as an elective subject from 2003 to 2006. Due to an increasing awareness of the important of being self-employed, it was then decided that entrepreneurship was to be a compulsory subject in 2006. As a compulsory subject, entrepreneurship has been taught at all seven faculties and must be taken by every student of Bengkulu University (Abduh, 2009; Sapri, 2003; Universitas Bengkulu, 2006). Since

entrepreneurship has been offered as a compulsory subject for about three years, it was considered to be the right time to review the development of the entrepreneurship course at Bengkulu University.

Research Objectives

This research was designed to evaluate the development of entrepreneurship education at Bengkulu University. It has several research objectives including the following:

to assess the development of entrepreneurship education at Bengkulu University, Indonesia, to investigate students' satisfaction with the delivery of the entrepreneurship subjects in terms of learning and teaching resources, teaching methods and achievement of expected outcomes.

Background

Entrepreneurship is the process in which one or more people undertake economic risk to create a new organization that will exploit a new technology or innovative process that generates value for others (Schramm, 2006). Among the organizations resulting from the entrepreneurial process are small and medium enterprises (SMEs). The growth of SMEs has long been regarded as the backbone of the economy in most countries, including Indonesia. As a matter of course, the majority of business units are SMEs, providing a significant contribution to employment, and contributing to the formation of national/regional income. Accordingly, stimulating the formation and development of new enterprises is regarded as a strategic policy to strengthen the

economic backbone. Strategic policy can be undertaken in many ways, including motivating university students to be entrepreneurs through entrepreneurship education (Hisrich, 2009; Kuratko, 2005).

As we delve into the literature on entrepreneurship education, it would be helpful to define what we mean by “entrepreneurship education”. We propose application of the definition of Shepherd and Douglas (1997):

The essence of entrepreneurship is the ability to envision and chart a course for a new business venture by combining information from the functional disciplines and from the external environment in the context of the extraordinary uncertainty and ambiguity which faces a new business venture. It manifests itself in creative strategies, innovative tactics, uncanny perception of trends and mood changes, courageous leadership when the way forward is not obvious and so on. What we teach in our entrepreneurship class should instill and enhance these abilities.

Entrepreneurship education was firstly taught at Harvard Business School in 1947 Katz (2003). Since then, other universities have followed offering entrepreneurship course. For example, New York University offered Entrepreneurship and Innovation (by Peter Drucker) in 1953, the University of Illinois offered “Small Business or Entrepreneurship Development” in 1953, Stanford University offered Small Business Management in 1954, and the Massachusetts Institute of Technology (MIT) offered an entrepreneurship course in 1958. In 1975 there were

already more than a hundred colleges/universities offering entrepreneurship courses. Today more than one thousand institutions in the United States offer entrepreneurship courses (Cone, 2007; Kuratko, 2005; Solomon, Duffy, & Tarabishy, 2002; Vesper, 1998). Entrepreneurship education is also currently offered by most universities in Indonesia, including Bengkulu University.

Entrepreneurship education at universities has several objectives. In general, the objectives include, among others: enhancing students' understanding of entrepreneurial concepts and contributions of SMEs to the economy; developing the entrepreneurial mindset of the students; motivating students to be entrepreneurs; providing students with entrepreneurial concepts and skills relevant to the formation and development of new businesses; and providing circumstances conducive to students starting a new business (Neck & Greene, 2011). Many entrepreneurship scholars cite entrepreneurial intentionality and self-efficacy as prominent objectives of entrepreneurship education (Franco, Haase, & Lautenschlager, 2010). Entrepreneurship has been found to be a popular subject and the recent data from US Small Business Administration showed that two thirds of college students intend to become entrepreneurs at some point in their careers (Shinnar, Pruett, & Toney, 2009).

Despite the emergence of entrepreneurship education at universities, there has been no consensus among universities regarding appropriate content for entrepreneurship subjects. Experts also vary in their suggestions of appropriate content for these subjects (Kuratko, 2005;

Schramm, 2006; Solomon Duffy, & Tarabishy, 2002, Fiet 2000). Thus, it appears that entrepreneurship is multidisciplinary in nature and should be able to accommodate so many relevant aspects. However, as suggested by Ronstadt (1987), “with time, the questions that ask if entrepreneurship can be taught or should be taught will be replaced increasingly by what should be taught and how it should be taught”. Fiet (2000a, 2000b) confirmed his prediction with twin papers on precisely these issues. Solomon (2007) found some common elements in entrepreneurship courses, including: venture plan writing, case studies, and readings and lectures by guest speakers and faculty. However, we identify that the entrepreneurship-directed approach to learning is based on the idea of experiential learning, in which new activity produces a new experience and new thinking through reflection (Maritz, Brown, & Shieh, 2010). The typical elements of small business management courses include class work, tests and a major project, such as the development of business plans; student business start-ups, consultation with practicing entrepreneurs; computer simulations; and behavioral simulations. Other popular activities include interviews with entrepreneurs, environmental scans, “live” cases, field trips and the use of video and films (Solomon, 2007).

Research Methodology

This study constitutes exploratory research on the development of entrepreneurship education at Bengkulu University. This includes assessing students’ satisfaction with the learning

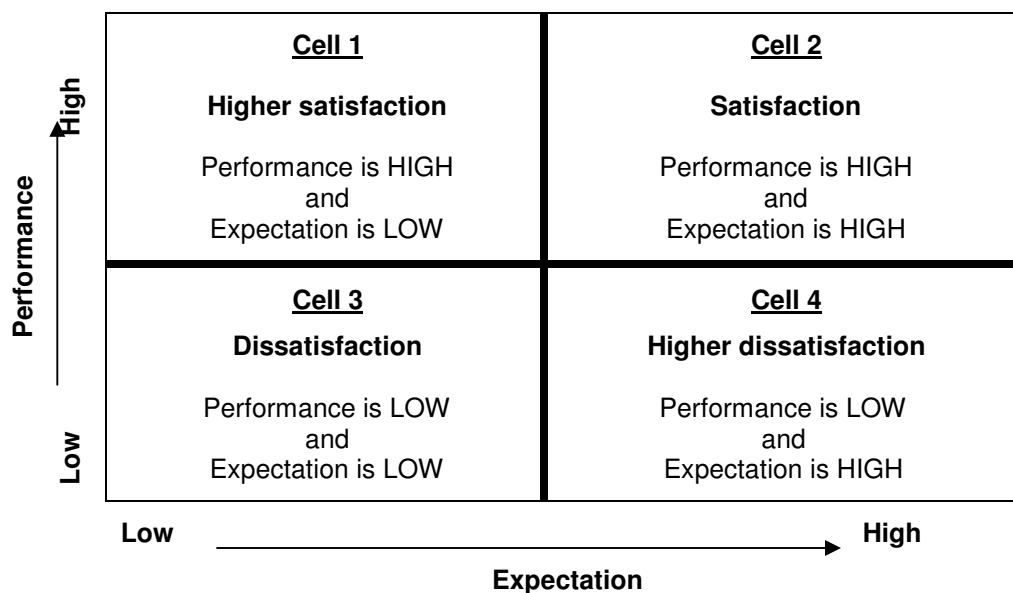
and teaching resources, teaching methods and expected outcomes of the entrepreneurship subject. This research used primary data collected from 15 lectures in the entrepreneurship subject and 189 students who had undertaken the subject at Bengkulu University using a combination of two data collection techniques, namely an interview and a questionnaire. The collected data include lecturers' opinions on the development of entrepreneurship education, and students' expectations and assessments (evaluation) of the implementation of the subject of entrepreneurship in terms of learning and teaching resources/contents, teaching methods, and outcomes expected from undertaking the subject.

The collected data were analyzed using descriptive analysis (Malhotra, Hall, Shaw, and Crisp, 1996) and the satisfaction matrix (SatMat) model (Abduh, D'Souza, Quazi, and Burley, 2007). The descriptive analysis was used to explain the development of entrepreneurship education by using some indicators, including the percentage of students interested in starting a new business. The SatMat model was used to identify and classify the level of students' satisfaction with the implementation of entrepreneurship course in terms of learning and teaching resources, teaching methods, and expected outcomes from undertaking the entrepreneurship subject. Students were asked to express their opinions on the importance of individual components of the learning and teaching resources, the teaching methods and the expected outcomes by using a Likert scale ranging from 1, representing "very unimportant", to 5,

representing “very important”; and their satisfaction with the delivery of these same components by using a Likert scale ranging from 1, representing “very poor”, to 5, representing “very good”.

Students’ satisfaction with the implementation of the entrepreneurship subject were estimated by comparing their perceptions of importance (i.e. their expectation) and delivery (implementation) of individual components of learning and teaching resources, teaching methods, and expected outcomes by using a T-test. To classify the students’ satisfaction level, the results of the comparison were plotted onto the satisfaction matrix (SatMat), consisting of four cells, as indicated in Figure 1.

Figure 1: Satisfaction matrix (*SatMat*) showing the level of students’ satisfaction/dissatisfaction with the implementation of entrepreneurship education.



Source: Adapted from Abduh *et al.* (2007)

Cell 1 reflects a situation in which students are assumed to be highly satisfied because the level of performance is higher than the importance (expectation) level. This means that the performance of the entrepreneurship education exceeds the level of expectation. Cell 2 represents a situation in which students are assumed to be moderately satisfied because their perception of performance is consistent with their expectations of performance. Cell 3 represents a situation in which students are assumed to have a lower level of dissatisfaction because their perception of the performance is low, and their level of expectation is also low. Cell 4 refers to situations in which students are assumed to be highly dissatisfied because the perceived performance is much lower than their expectation.

Results and Discussion

Research was conducted on 15 lecturers of entrepreneurship and 189 students from seven faculties in Bengkulu University. Those students had undertaken and passed various entrepreneurship subjects. The research participants were interviewed and asked to complete a questionnaire designed to explore their opinions regarding the implementation of the subject of entrepreneurship in their own faculty.

Entrepreneurship Education Development in Bengkulu University

Entrepreneurship education has been offered at Bengkulu University since the 1990s, through several types of activities such as seminars, workshops, training, short courses and

community services. However, those entrepreneurship education activities were not specifically designed for students. Those activities were also only available on a temporary basis, depending on the availability of a relevant grant.

This unfortunate situation resulted in some weaknesses, including the following: (a) those entrepreneurship education programs were conducted on a temporary basis and hence had only short term objectives and a lack of sustainability; (b) a continual mechanism for a sustainable entrepreneurship education had not, as yet, been made available; (c) no regular and comprehensive evaluation had been undertaken to assess the impacts of entrepreneurship education on the development of student entrepreneurship; and (d) no record was available of the number of students/graduates who had become entrepreneurs.

In 2003, Bengkulu University started to offer its students a regular entrepreneurship course as an elective subject. Evidence shows that the number of students who applied for the entrepreneurship subject increased every year, suggesting an increase in interest among students in the entrepreneurship offering. Due to the increasing awareness of the importance of being self-employed, followed by the increase in students' interest in entrepreneurship, Bengkulu University decided in 2006 to offer the entrepreneurship course as one of the University's compulsory subjects. As a compulsory subject, the entrepreneurship course is currently being taught at all seven faculties and must be taken by every student. More recently (2009), the

University of Bengkulu obtained a national project in entrepreneurship education entitled the Student Entrepreneurship Program (SEP), offered by the Directorate of Higher Education the Republic of Indonesia. The SEP program looks more comprehensive. Besides providing entrepreneurship training, the program also offered a certain amount of money for initial capital to run a business for students who passed the training and a selection process.

These overall developments to date suggest that entrepreneurship education at Bengkulu University has progressed over time. The following passages present the survey results from the lecturers and students of the entrepreneurship subject.

Students' Interest in Entrepreneurship

A survey of entrepreneurship lecturers at Bengkulu University in 2009, found that most (77%) estimated that between 11 and 20% of students in their classes were interested in starting their own businesses, more than in a similar 2008 survey by Abduh. Compared with a 1993 study by the Job Placement Center of the University of Bengkulu, which found only 1% of students were interested in doing a business course, this represents a massive increase in interest in entrepreneurship and can be regarded as a strength of the existing and future development of entrepreneurship education at Bengkulu University.

Students' Satisfaction with Learning and Teaching Resources

Students' satisfaction with the materials for the subject of entrepreneurship was specified by using the technique of SatMax (Satisfaction Matrix) described above. Students were initially asked to express their perceptions on the "importance" (expectation) of 11 additional units of study commonly provided in the subject field of entrepreneurship in Bengkulu University and subsequently to express their perceptions on the quality of delivery (performance) of the 11 units as they experienced them while studying the subject. The results of the data analysis are presented in Table 1 below.

Table 1. Students' perceptions on the importance and performance of learning and teaching resources

No.	Learning and teaching resources	Mean of Perceived Importance (Expectation)	Mean of Perceived Performance	Mean Difference [* = sig]
a.	Introduction of Entrepreneurship	4.21	4.02	-0.19
b.	Entrepreneurs' Characteristics	4.14	4.11	-0.03
c.	Business Environment Analysis	4.35	4.15	-0.20
d.	Business Opportunities Identification	4.73	4.35	-0.38
e.	Business Plan	4.67	3.35	-1.32*
f.	Business Management	4.45	4.20	-0.25
g.	Marketing	4.49	4.03	-0.46
h.	Financial Analysis	4.56	3.31	-1.25*
i.	Financial Report	4.46	3.20	-1.26*
j.	Business Evaluation	4.47	4.24	-0.23
k.	Business Development Strategy	4.58	4.28	-0.30

Perceptions of importance of each of the 11 components of the learning and teaching resources was very high (mean values greater than 4 on a scale of 5). Business plan, business opportunities recognition, business development strategy and financial analysis were found to be perceived as the most important units of study.

Students assessments of performance (delivery) of the performance of individual learning and teaching resources ranged from 3.20 ('moderate') to 4.35 ('high'). Business Opportunities Identification received the highest mean rating for performance and Financial Report the lowest.

The level of student satisfaction with each of the 11 sets of learning and teaching resources was estimated by comparing mean values of students' expectations (importance) with mean values of perceptions of the performance (delivery) of each set. The results, presented in Table 1, show a negative mean difference for all 11 sets, which would appear to indicate that expectations were not met. However, for eight of the units, the mean difference was not statistically significant, suggesting that students' expectations were generally met, and were therefore classified as 'satisfaction'. For the remaining three, the differences were large and statistically significant, indicating 'high dissatisfaction' with delivery of these sets of learning and teaching resources. Figure 2 presents the satisfaction matrix, showing the classification of each of the 11 sets studied.

Students' Satisfaction on Teaching Methods

Students' satisfaction with teaching methods in entrepreneurship subjects was assessed by applying the same research methods as those applied above to determine the students' satisfaction with the learning and teaching resources. Student participants were asked to express their opinion on the importance (expectation) and performance (delivery) of nine types of teaching methods commonly used in the Bengkulu University. The results of the data analysis are presented in Table 2 and Figure 2.

The mean values of students' perceptions of importance of teaching method range from 3.67 to 4.85 on a five-point scale, suggesting that all types of teaching method were perceived as important to very important by the students. The teaching method of 'business field practice' was found to be the most important method of entrepreneurship education, followed by 'conducting field research' and 'individual tasks: making a plan of an own business'. The 'business field' is an activity in which the students create a market for a couple of days, which are termed 'market days'. The method 'study group' had the lowest mean score by some margin, indicating that this method was not favored by students.

Students' perceptions on the performance of the practice of teaching methods varied among the method types, ranging from 3.13 to 4.89 on a five-point scale. Methods 'business

field practice', 'group tasks' and 'conducting field research' scored highest, while methods 'self-directed studying' and 'individual tasks' were perceived by students as less effective.

Table 2. Students' perceptions on the importance and performance of teaching methods

No.	Teaching Methods	Mean of Perceived Importance (Expectation)	Mean of Perceived Performance	Mean Difference [* = Sig]
A	Facilitator:			
	i. Entrepreneurship Lecturer	4.50	4.35	-0.15
	ii. Guest Lecturer	4.14	4.02	-0.12
B	Class Discussion	4.31	4.13	-0.28
C	Group Discussion	3.94	3.30	-0.64
D	Study Group	3.67	3.13	-0.54
E	Self-directed studying	4.05	3.42	-0.63*
F	Individual tasks: making a plan for an own business	4.75	3.51	-1.24*
G	Group tasks: making a plan for a business owned by group and preparing for a field practice	4.15	4.81	+0.66*
H	Conducting field research	4.80	4.66	-0.14
I	Business Field practice (market days)	4.85	4.89	+0.04

The results of the estimation of students' satisfaction level with teaching methods are presented in Table 2 and Figure 3. 'Group tasks' and 'field practice' were each found to have a positive mean difference, which was statistically significant in the case of 'Group tasks'.

The other methods have a negative mean difference, but that difference was significant for methods in only two units: 'self-directed studying' and 'individual tasks: making a plan for an own business'. These findings suggest that students had difficulty in understanding the

concept of a business plan, and then had difficulty in preparing their own business plan. Hence, this resulted in a finding of negative effectiveness for teaching methods in those two units of study.

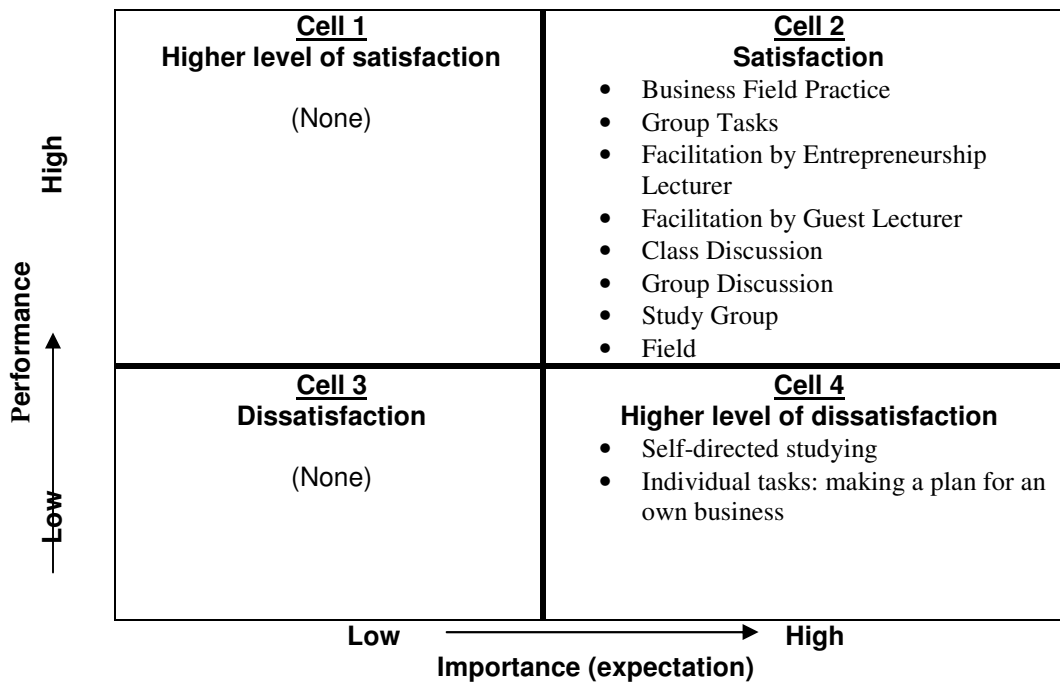


Figure 3. Students' satisfaction level with the methods of entrepreneurship education

Students' Satisfaction with Expected Outcomes

There are several outcomes that students expect to achieve after undertaking an entrepreneurship subject. In general, these include: an understanding of entrepreneurship and its roles in, and contributions to, an economy; an understanding of the characteristics of

entrepreneurs; the ability to discover business opportunities; the capability to prepare a business plan; the ability to design business strategies; ability in financial management and recognition of capital sources; the ability to obtain capital; ability in preparing financial reports; and ability in evaluating the performance of a business and providing relevant recommendations. The results of the data analysis on the expected outcomes are presented in Table 3 and Figure 4.

Table 3. Students' perceptions on the importance and performance of expected outcomes

No.	Expected Outcomes	Mean of Perceived Importance (Expectation)	Mean of Perceived Performance	Mean Difference [* = Sig]
a.	Better understanding of entrepreneurship and its roles in, and contributions to, an economy	4.20	4.37	+0.17
b.	Understanding of entrepreneurs' characteristics	4.15	4.11	-0.04
c.	Ability in recognizing business opportunities	4.44	4.05	-0.39
d.	Capability in preparing a business plan	4.48	3.23	-1.25*
e.	Ability in formulating marketing strategies	4.35	4.31	-0.04
f.	Ability in recognizing capital sources	4.33	4.02	-0.31
g.	Ability in obtaining initial and additional capital	4.42	4.15	-0.07
h.	Ability in financial planning and reporting	4.35	3.34	-1.01*
i.	Ability in evaluating performance of a business and providing relevant recommendations	4.44	3.36	-1.08*

All of the mean values of students' responses on the importance of the individual expected outcomes are above 4 on a five-point scale, suggesting that the students attach high importance to all the expected outcomes. The outcomes rated as most important were: ability to prepare a business plan, the ability to recognize business opportunities, the ability to obtain initial and additional capital, and the ability to formulate marketing strategies.

The mean values of students' perceptions of actual achievement of each expected outcome, as seen in Table 3, ranged from 3.33 to 4.47 on a five-point scale. These figures suggest that the performance of the outcomes achievement was fairly good. Lowest rated outcomes were 'capability in preparing a business plan' and 'ability in financial planning and reporting'. These findings reinforce the conclusion that the majority of students experienced significant difficulties in preparing their own business plan.

The results of the analysis of students' satisfaction levels in Table 4 indicate that mean differences were not significant for expected outcomes, except for three: 'preparing a business plan', 'financial planning', and 'business evaluation', which were significant and negative. These findings suggest that the students were generally satisfied with the achievement of expected outcomes, except for those three. For those three outcomes, students can be classified as having a higher level of satisfaction, while for the achievement of the remaining expected outcomes; the students can be classified as satisfied, as illustrated in Figure 4.

Coordination of Entrepreneurship Education

The variety of students' opinion on the practice of the subject of entrepreneurship was also explored in terms of the ways the subject was delivered in individual faculties. The results indicate that there were slight variations among the lecturers in the different faculties in terms of the focus, material and teaching. These variations were suspected to be potential factors causing the variation in students' responses. This issue was not deeply investigated in the survey of this study, but it merits future research. The findings also suggest that there was a lack of coordination between faculties in terms of material and teaching methods in delivering the subject of entrepreneurship.

Conclusions and Recommendations

As a response to an increasing rate of unemployment, especially among educated people, a number of entrepreneurship programs have been conducted at Bengkulu University. Since 2006, entrepreneurship has been a compulsory subject and, accordingly, every student must take this subject. This study was intended to review the practice of that compulsory subject. Based on the results of the study, there are several conclusions that can be drawn:

Education in entrepreneurship at Bengkulu University is making progress over time. This progress was indicated by, among other things, an increase in the number of students who were interested in becoming entrepreneurs.

Students' perceptions of teaching methods indicated that group-based and experiential learning activities: business field practice, conducting field research, and preparing a business plan were most highly valued, while individual and theoretical methods were least valued.

Students attached high importance to all expected outcomes which could be gained from studying entrepreneurship subjects. However, students' perceptions of their achievement of expected outcomes associated with planning and financial reporting were lower, indicating greater difficulty in teaching these skills.

All of the findings suggest that a majority of participating students experienced significant difficulties in understanding and preparing a business plan.

The findings imply that there is a need for urgent improvement in delivering the entrepreneurship content, especially in relation to learning and teaching resources and teaching methods, to enhance the capability of students in preparing a business plan. Moreover, this study has tried to shed some light on several areas of the practice of the subject of entrepreneurship, such as students' perceptions of the importance of the existing learning and teaching resources, teaching methods, and expected outcomes from the subject. These include enhancing entrepreneurial self-efficacy and intentionality. However, several important aspects relating to the findings have not yet been examined. Accordingly, future research should be focused on an improvement in learning and teaching resources, teaching methods, pedagogy and the level of

students' satisfaction. Further studies should also be focused on formulating relevant strategies to enhance the effectiveness of entrepreneurship education in the future. Longitudinal studies examining student self-efficacy and intentionality are also recommended.

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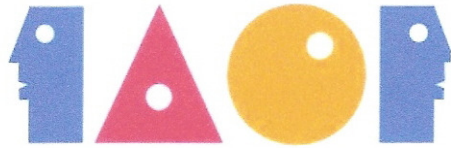
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DO CROSS-FUNCTIONAL NPD TEAMS FOLLOW THE KNOWLEDGE
CONVERSION MODEL IN KNOWLEDGE TRANSFER?

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Abstract

This article attempts to follow the steps of the new product development (NPD) period and to develop a transfer model to describe the NPD team's knowledge transfer situations. This study also discusses situations where the knowledge transfer process between the research and development (R&D) and marketing departments is perfect or imperfect, in theory and in practice.

Keyword: new product development (NPD), transfer model, knowledge transfer process

Introduction

Studies have repeatedly shown that expertise and experiences shared between R&D and marketing can aid the new product development (NPD) process (Maltz, Souder et al. 2001; Souder, Berkowitz et al. 2005). Szulanski (1996; Szulanski 2000) also emphasized the importance of effective collaboration and knowledge transfer between R&D and marketing staff personally. However, while much of the literature agrees that the knowledge transfer process at inner department should follow the knowledge conversion model of Nonaka & Takeuchi ((Nonaka and Takeuchi 1995; Henard and mcfadyen 2006; Huang, Chang et al. 2008), few studies have followed the steps of NPD period or offer a transfer model to describe knowledge transfer situations for the NPD team. Moreover, whether the NPD team, consisting of the R&D and marketing departments follows the knowledge conversion model in knowledge transfer remains to be established.

This study focused on the knowledge transfer process within NPD teams of small and medium-sized enterprises (SMEs), where because of the smaller number of personnel, the time devoted to tasks by each individual becomes more important to the overall success of the company. Following the traditional model (Khalil 2000), we considered the planning stage through the commercial launch stage as comprising the NPD period, because most small-scale

operations still follow this model to develop new products and do not have the enough employees or resources to conduct concurrent engineering.

Knowledge Conversion Model

The knowledge conversion (Nonaka and Takeuchi 1995) is an interactive process between tacit knowledge and explicit knowledge and involves four steps; each organization member can increase his own knowledge through the spiral by socialization, externalization, combination, and internalization ('SECI' spiral) (Nonaka and Takeuchi 1995; Nonaka, Toyama et al. 2000). The competitiveness of an organization is thereby enhanced and the knowledge sharing and integration process can generate new knowledge. In addition, these four steps occur continuously in sequence; none can be ignored or skipped. If any step is omitted, it can severely influence the operation of the knowledge conversion and even stop it working, so that the process no longer moves forward (Huang, Chang et al. 2008).

Knowledge Conversion in the NPD Period

Theoretically, the stages of the NPD process and the steps of knowledge conversion should change with time, from the planning stage through the commercial launch stage. The characteristics of knowledge transfer should also be different in each step.

Product development has multiple phases, from early trials to the marketing and final commercial release. The numerous steps required by regulators are a major reason for the large

costs and long timeframes in high technology NPD (Chang, Tsai et al. 2011). Each product could fail at any stage in the development period, but the greatest fear is that products will fail in the later rather than earlier phases of development. The high risks associated with product development have encouraged companies to seek approaches to reduce these risks.

In this article, the authors have tried to combine the NPD stages with knowledge-conversion steps. Then has described how the level of knowledge about a product changes through the successive stages in the development of a new product (Fig 1. The NPD Knowledge Conversion).

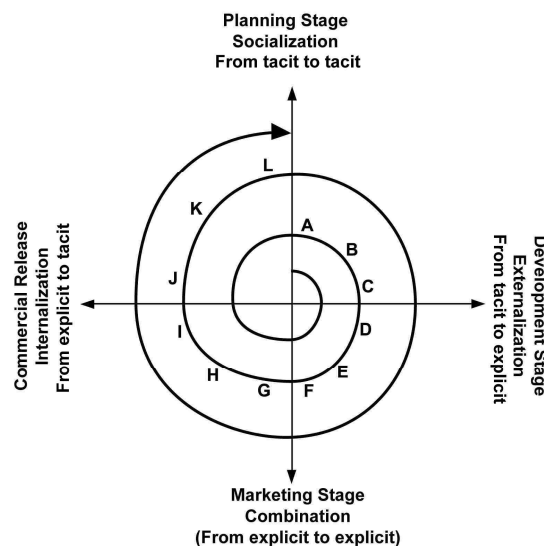


Figure 1. NPD's Knowledge Conversion

Source: this study

In the planning stage, the knowledge related to NPD exists independently in the R&D and marketing groups, which means that tacit knowledge transfer and conversion occurs between

group members by social interaction and sharing experiences (socialization). Overall organizational knowledge regarding the product is low and is slow to develop as both R&D and marketing attempt to formalize their ideas and plan the future development of the new product.

Subsequently in stage 2 (development), more formalized concepts are developed into prototypes by R&D. The organization's knowledge of the product will be rapidly developed as problems are researched and overcome by both R&D and marketing in this stage. The personal and group tacit knowledge, including experimental steps, patent concepts, and market analyses, will be scripted and codified into words as explicit knowledge. By far the greatest proportion of the knowledge about a product will be created during this stage.

Nonaka and Takeuchi (1995) believed that externalization was a critical step in knowledge conversion. The externalization of NPD knowledge serves two purposes. One is transferring the tacit knowledge that is kept in individual minds into explicit knowledge of the staff in each department. Another is representing and transferring the department's knowledge to the staff of other departments. As an example, R&D staff can describe the R&D concepts in steps and write the prototype knowledge into patent documents while marketing can gain expertise from market research and analysis and document this. However, if such companies do not possess a rigorous verification mechanism to determine the correctness of documented knowledge, it can be of little value in the externalization process(Huang, Chang et al. 2008).

In stage 3 (marketing), the prototypes have largely been completed and tested, and the remaining marketing information required before final launch will be collected, based primarily on these prototypes. Minor modifications to the prototypes may be made, based on information obtained, perhaps, from pre-launch trials conducted by clients.

In perfect collaboration between departments, explicit knowledge acquired by R&D and marketing are combined and re-synthesized; furthermore, this process will create new explicit knowledge. This means the pieces of information related to NPD explicit knowledge are integrated into an explicit package and achieve a synergistic effect. Finally, a complete level of organizational knowledge of the product will be diffused and acquired by all NPD staff.

At launch (stage 4), it is often the case for successful products that little extra knowledge is gained by the organization, assuming that previous knowledge acquisition has been completed successfully in earlier development stages. Under conditions of sub-optimal collaboration, overall product knowledge is more slowly developed and obtained. High technology companies typically do not go to commercial launch before they have obtained all the knowledge they require. In fact, in circumstances where products are released without complete information or knowledge there is evidence to suggest that a large majority of such products fail to reach full market potential.

After the product has been launched, in theory, once the NPD staff experience the socialization, externalization, and combination steps within knowledge conversion, they internalize the knowledge, so that it becomes their personal tacit knowledge. Thus, employees can upgrade their own working ability and expertise through the NPD experience, which is advantageous in the next NPD project (Souder, Berkowitz et al. 2005).

Questions and Debates for NPD's Knowledge Conversion

If the NPD Knowledge Conversion is a Good Model to Describe the Knowledge Transfer Between R&D and Marketing Staff in the NPD Period, What Happens Next?

Perfect Knowledge Transfer

Theoretically, in perfect knowledge transfer, knowledge acquired by one group is dissipated throughout the organization. The knowledge levels of all R&D and marketing personnel would increase in almost perfect synchrony after the knowledge transfer has occurred, with R&D members comprehending the marketing expertise totally and the marketing members understanding technical and engineering knowledge perfectly (Huang, Chang et al. 2008). In this perfect world, knowledge gaps and knowledge transferring glitches would not exist.

Figure 2 represents the complete level of organizational knowledge of the product shared by all employees. At the same time, under perfect collaboration, the time from planning to product launch (NPD time) is minimized. Also, while each of the stages is successive and

distinct, they can overlap to differing degrees, with, for example, marketing being executed (market analysis and sales forecasting) while development is still ongoing (prototype improvements, patent search, filing of patent application).

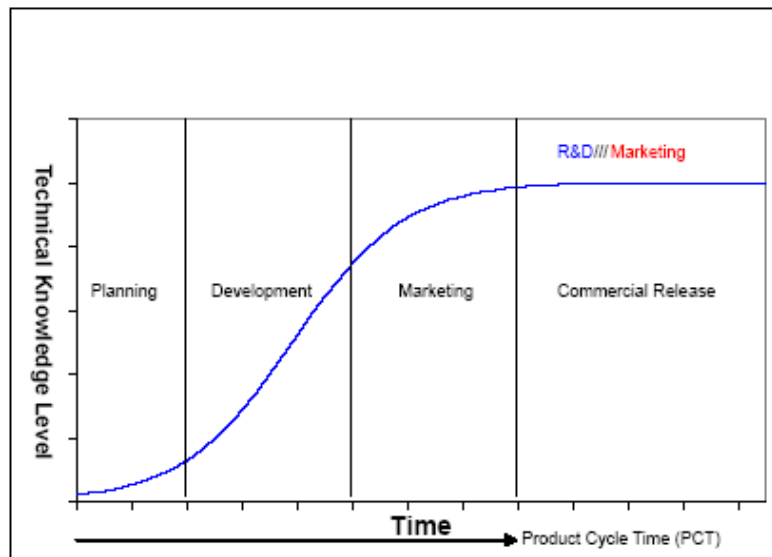


Fig. 2 Theoretical Pattern of Product Knowledge Level under Perfect R&D/Marketing Knowledge-Conversion

However, if Knowledge Transfer is Perfect, What Will Happen?

Based on the literature (Chang et al 2011; Szulanski 1996, 2000; Huang et al 2008) and authors' experience in R&D, knowledge transfer sometimes equals work transfer. Knowledge gaps and knowledge transferring glitches do not exist here (R&D and marketing personnel knowledge is in perfect synchrony) and this high tech firm has developed new products for decades. This study considers whether the marketing staff can replace the R&D staff, to do R&D work and, for example, to propose new inventions. Simultaneously, can the R&D staff replace

the marketing staff and do market analysis and provide quotes to clients and forecast the market?

Moreover, it seems that either R&D or marketing staff will become “super heroes” within the company and be able to handle both an engineer’s and a salesperson’s job. If this is true, why do we have to hire so many employees? We only need a few heroes or expect that some of the employees can become heroes. Often in SMEs, the general manager or CEO does possess the firm’s core technology and may have the ability to do other jobs too.

Furthermore if the knowledge transfer is perfect, it raises some questions. Initially, the tacit knowledge transfer process (socialization) should happen within a department, but how does socialization occur between departments? How does mentoring work for marketing staff in gaining R&D expertise or for R&D staff in learning Marketing knowledge? Are there other ways of cross-functional learning not mentioned by Nonaka or other scholars? Does the mechanism of knowledge conversion in cross-functional groups involve a socialization step?

What of an Impact Knowledge Transfer?

In the real world, no matter how great the motivation to transfer tacit knowledge, perfect knowledge transfer is highly unlikely, if not impossible, between different functional groups involved in NPD activities; barriers do exist. There is asymmetrical information and a professional knowledge gap in the NPD project and mentoring does not always work for cross-functional groups.

When we consider college programs, marketing and engineering students are in different faculties, and apart from some common courses, such as foreign languages and history, to obtain a first degree, marketing and engineering students do not attend the same specialist courses. Moreover, many students go on to obtain a higher degree in the same field or directly enter the employment market. Engineering students have little or no contact with international trade practice, marketing, or economics and still fewer business students learn about mechanics or physical metallurgy.

How then, realistically, can senior R&D staff pass R&D knowledge to marketing staff via a mentoring system? There are some marketing staff in high tech fields who gained a science or engineering degree before going on to work in marketing, and who are likely to be chosen by NPD teams. However, from the R&D and teaching experience of the authors, while this kind of employee is more likely to gain expertise from the R&D group than one with a purely marketing background, when the new product development progresses to the intellectual property protection steps, such as applying for a patent, even a marketing person with an engineering background is unlikely to appreciate the causal relationships between theory and experimental steps. After all, they did not participate in the development of the product and they likely did not excel in their technical field, not least because they chose to switch fields, but the authors do not address that issue here.

Despite this, some scholars (Doz, Santos et al. 2001) still consider the patent application and marketing analysis report to be explicit; in contrast, other studies (Chang, Huang et al. 2005; Tschang 2005; Huang, Chang et al. 2008) believe that this knowledge is still tacit. In addition, cross-functional NPD teams will face problems in ensuring that marketing staff have sufficient understanding even of engineering terminology and techniques in the patent context to appreciate what the patent application seeks to cover and furthermore to recognize possible infringement issues with other published patents or applications and blueprints.

The authors claimed that the context of the patent should be tacit knowledge while have obtained more than ten invented patents world widely. The examples in a patent application and the evidence of related experiments are also tacit knowledge. This means that people who possess expertise in the field can not necessarily implement the experiments. For example, in the Taiwanese orthopedic medical device field there are many professors, but fewer than 10 people own patents on products. Invention requires different knowledge to that needed for publishing academic articles on a subject. In addition, if a patent describes explicit knowledge, it suggests that everyone can realize the context and appreciate patent infringement or whether claims overlap. If marketing staff can do this, there would seem to be no need for courts and attorneys.

If Knowledge Transfer is Imperfect, What Will Happen?

Knowledge gaps and knowledge transfer glitches do exist. R&D and marketing personnel knowledge is not synchronized, regardless of how long a history of NPD a company has. The main reason is because of the expert knowledge and experience that is associated with each set of tasks and objectives of each group. As a result, high tech companies do have to hire many staff with various backgrounds to develop new products. It has been suggested that it is not necessary to transfer specialist knowledge in a codified form (Nonaka and Takeuchi 1995); rather, the focus should be on transfer of *project-related knowledge* as and when required.

It is difficult to make expert knowledge explicit. Marketing and R&D staffs do not have much common expertise or even common terminology in the real world. In fact, with all these apparent problems, it might seem miraculous that SMEs do succeed in developing new products.

Conclusion

In sum, this study believes that the NPD knowledge conversion model does works for cross- functional groups, even if the knowledge is not synchronized. This study suggests that if high tech companies can build a common language and level of expertise for team members to assist NPD staff on document matters and offer appropriate information systems and provide a suitable environment for discussion, these methods can assist members in transferring NPD explicit knowledge into personal experience and tacit knowledge and to minimize knowledge gaps in the NPD knowledge conversion.

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EFFECTS OF PATERNALISTIC LEADERSHIP ON JOB SATISFACTION – REGULATORY FOCUS AS THE MEDIATOR

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Abstract

Aiming at the gap in present research on Paternalistic Leadership and Regulatory Focus, this study tends to establish a research model for the relationship among Paternalistic Leadership, Regulatory Focus, and Job Satisfaction. Having 498 employees in the manufacturers in Southern Taiwan Science Park as the research subjects, Multiple Regression and Hierarchical Regression are applied for data analyses. The findings show that (1) Benevolent Leadership and Authoritarian Leadership appear significantly positive effects on Enhancement Focus and Prevention Focus, (2) Enhancement Focus presents remarkably positive effects on Extrinsic Job Satisfaction, (3) Benevolent Leadership and Moral Leadership reveal notably positive effects on Job Satisfaction, while Authoritarian Leadership appears remarkably negative effects on Intrinsic Job Satisfaction, and (4) Benevolent Leadership presents positive effects on Extrinsic Job Satisfaction with the mediation of Enhancement Focus. According to the research findings, the practical meaning and the future research orientation are further discussed in this study.

Keywords: Regulatory Focus, Paternalistic Leadership, Job Satisfaction, Benevolent Leadership, Hierarchical Regression

Introduction

Cheng, Huang & Chou (2002) considered that the leadership was likely to reflect the cultural context, not entirely determined by individual will. Such an idea was proven by some cross-cultural comparison researchers, like Hofstede (1980, 1994); however, it has not been emphasized. Chou et al. (2006) indicated that to have Paternalistic Leadership step forward to the stages of reinforcement and acceptance, issues like the confirmation and the revision of triad model, the regulation of construct, the improvement of measuring tool, and the introduction of new moderator and mediator required further discussions. The first motive for this study was therefore induced. Some organizations and psychologists (Rafaeli & Sutton, 1989; Staw & Barsade, 1993; George & Brief, 1996) invested in great concern and study on individual emotional experiences and the potential effects of emotional experiences on intrinsic motives. Higgins (1997, 1998) proposed that Regulatory Focus Theory particularly focused on individual emotional experiences, the importance, and the effects which could help explain the relationship between the emotional experiences and the intrinsic motives induced by the experiences and the job attitude and behaviors. Nevertheless, the empirical research of Regulatory Focus Theory on organizational behaviors and human resource management required improvement. For this reason, the second research motive was induced for this study. Brockner & Higgins (2001) preceded conceptual discussions on the relationship among Regulatory Focus, Transactional

Leadership, Regulatory Focus, and Job Satisfaction and indicated the correlations among Regulatory Focus, Transactional Leadership, and Job Satisfaction. They expected the further researchers to precede empirical research with non-experimental design. With the samples of employees in public sectors, domestic researchers (Tseng, Lee & Kang, 2008; Tseng & Kang, 2008, 2010) preceded the quantitative research of questionnaire survey on the relationship among Transactional Leadership, Regulatory Focus, and Job Attitude, under the background of Chinese culture in Taiwan. As domestic Paternalistic Leadership is stepping towards the stages of reinforcement and acceptance, the third motive of the mutual effects among Paternalistic Leadership, Regulatory Focus, and Organizational Commitment was induced for the empirical research. Based on the above statements, the research purposes were listed as to discuss 1.the direct effects of Paternalistic Leadership on Regulatory Focus and Job Satisfaction, 2.the direct effects of Regulatory Focus on Job Satisfaction, and 3.the mediation of Regulatory Focus in the relationship between Paternalistic Leadership and Job Satisfaction.

Literature Review and Hypotheses

Research on Paternalistic Leadership originated from the qualitative research of Silin (1976), Redding (1990), and Cheng (1995) on the observation and interview with Chinese entrepreneurs. Paternalistic triad model was proposed with complete theoretical structure, including the major components of bestowing favor, setting up prestige, and accumulating merit

as well as three key factors of authority, benevolence, and morality. Besides, there were corresponding effects between Paternalistic Leadership and Transactional Leadership. First, in terms of the correlations with emotional factors, both Paternalistic Leadership and Transactional Leadership would influence the intrinsic mind of subordinates, tightly connect with their feelings with the power of emotion, and further affect their behaviors (Farh & Cheng, 2000; Rafaeli & Worline, 2001; Chou et al., 2006). Second, in regard to the corresponding effects, Authoritarian Leadership in Paternalistic Leadership was similar to the high-performance behavior of intellectual simulation in Transactional Leadership (Lin et al., 2000; Cheng, 2001); Benevolent Leadership and Moral Leadership were similar to individual concern and attraction in Transactional Leadership (Cheng et al., 2003; Su, 2007; Cheng et al., 2004); and they appeared positive correlations with intellectual simulation, attraction, setting a good example, and individual concern.

Regulatory Focus Theory (Higgins, 1997, 1998) mainly discussed how individuals were inspired to approach happiness and avoid pain. The theory regarded that individuals presented the self-regulation systems of Hedonism, Enhancement Focus and Prevention Focus (Freidman et al., 1997; Idson et al., 2000; Brockner et al., 2002). Individuals with Enhancement Focus were keen for acquisition and positive results that the strategies tended to the harmony of happiness pursuit and desired results. On the contrary, individuals with Prevention Focus were keen for

losing that the strategies tended to avoid making mistakes. Higgins (1997, 1998) and Brockner & Higgins (2001) indicated that the differences between Enhancement Focus and Prevention Focus in Regulatory Focus could be explained with the three factors of 1.individuals pursuing satisfaction, 2.individuals attempting to achieve the objective or the standard, and 3.relevant psychological situations of individuals.

Moreover, domestic researchers (Chou et al., 2006; Chen et al., 2008) preceded several empirical studies on the relationship between Paternalistic Leadership and Enhancement Focus and found that behaviors with Benevolent Leadership and Moral Leadership presented notably positive effects on Enhancement Focus of employees, while behaviors with Authoritarian Leadership appeared significantly positive effects on negative focuses of employees.

Nonetheless, Tsai, Kuntson & Fung (2006) indicated that Chinese people were likely to be aroused positive and Prevention Focus when having ideal emotional experiences. Cheng & Chiang (2006) proposed that Benevolent Leadership would result in the employee reaction of Enhancement Focus. Besides, behaviors with Authoritarian Leadership not only would cause fear of subordinates (Wu, Cho & Cheng, 2008), but would also arouse their angry emotion (Wu et al., 2002). Both fear and anger were negative emotions, but the induced motives were extremely different. According to the above research, Hypothesis 1 was proposed in this study.

H1: Paternalistic Leadership presented significant effects on Regulatory Focus.

H1-1: Moral Leadership would positively affect Enhancement Focus.

H1-2: Moral Leadership would positively affect Prevention Focus.

H1-3: Benevolent Leadership would positively affect Enhancement Focus.

H1-4: Benevolent Leadership would positively affect Prevention Focus.

H1-5: Authoritarian Leadership would positively affect Enhancement Focus.

H1-6: Authoritarian Leadership would positively affect Prevention Focus.

Robbins (1998) pointed out Job Satisfaction as a kind of job attitudes which showed the overall feelings or evaluation of employees towards the job, including rewards, job characters, and overall job satisfaction. It could be classified into Intrinsic Job Satisfaction and Extrinsic Job Satisfaction. This study applied the definition and the classification of Job Satisfaction proposed by Robbins (1998) as the reference of theory development. According to the empirical findings of Cheng & Wu (2006) on the relationship between Paternalistic Leadership and Job Satisfaction, Moral Leadership appeared positive effects on Job Satisfaction of subordinates (Cheng, Hsieh & Chou, 2002; Cheng et al., 2003). Relatively, Authoritarian Leadership revealed remarkably negative correlation with Job Satisfaction (Wu, 2008) and appeared significantly negative predictions (Cheng et al., 2003; Ren et al., 2004; Wu, 2008). In conclusion, this study considered that the rewards, the job characters, and the overall job satisfaction of subordinates would be promoted when Benevolent Leadership and behaviors of individual care, understanding, fairness, and being responsible with Moral Leadership were adopted. Moreover,

behaviors of overawing, despotism, hiding, and severity with Authoritarian Leadership could reduce the rewards, the job characters, and the overall job satisfaction of subordinates. For this reason, Hypothesis 2 was proposed in this study.

H2: Paternalistic Leadership appeared notable effects on Job Satisfaction.

H2-1: Moral Leadership showed significantly positive effects on Job Satisfaction.

H2-2: Benevolent Leadership revealed remarkably positive effects on Job Satisfaction.

H2-3: Authoritarian Leadership appeared notably negative effects on Job Satisfaction.

Regarding the relationship between Regulatory Focus and Job Satisfaction, Regulatory Focus Theory considered that job emotional experiences of employees could be divided into happiness and pain (Brockner & Higgins, 2001). Aiming at the relationship between Regulatory Focus and Job Satisfaction, the empirical research of domestic researchers (Tseng, Lee & Kang, 2008; Tseng & Kang, 2008) discovered that Enhancement Focus presented remarkably positive effects on Job Satisfaction, while Prevention Focus revealed negative effects. In this case, it was inferred that the inducement of Enhancement Focus could enhance the job satisfaction of employees; contrarily, the inducement of Prevention Focus could reduce the job satisfaction. As a result, Hypotheses 3-1 and 3-2 were proposed in this study.

H3: Regulatory Focus would significantly affect Job Satisfaction.

H3-1: Enhancement Focus would positively affect Job Satisfaction.

H3-2: Prevention Focus would negatively affect Job Satisfaction.

In regard to the mediation effect of Regulatory Focus on the relationship between Paternalistic Leadership and Job Satisfaction, there has not yet been any empirical research for reference. Wu, Hsu & Cheng (2002) found that Authoritarian Leadership of the direct supervisor would result in negative effects on Job Satisfaction through angry emotions. It was further discussed that the emotion of subordinates could be the mediation between Authoritarian Leadership and Job Satisfaction. It was therefore inferred that Paternalistic Leadership would indirectly affect Job Satisfaction through the mediation of Regulatory Focus. Consequently, Hypothesis 4 was further proposed in this study.

H4: Paternalistic Leadership would remarkably affect Job Satisfaction with the mediation of Regulatory Focus.

H4-1: Moral Leadership would positively affect Job Satisfaction with the mediation of Enhancement Focus.

H4-2: Benevolent Leadership would positively affect Job Satisfaction with the mediation of Enhancement Focus.

H4-3: Authoritarian Leadership would positively affect Job Satisfaction with the mediation of Enhancement Focus.

H4-4: Moral Leadership would negatively affect Job Satisfaction with the mediation of Prevention Focus.

H4-5: Benevolent Leadership would negatively affect Job Satisfaction with the mediation of Prevention Focus.

H4-6: Authoritarian Leadership would negatively affect Job Satisfaction with the mediation of Prevention Focus.

Research Design and Methods

Research Framework

According to the research motives, the research purpose, and the relevant literatures, this research framework was established as Fig. 1.

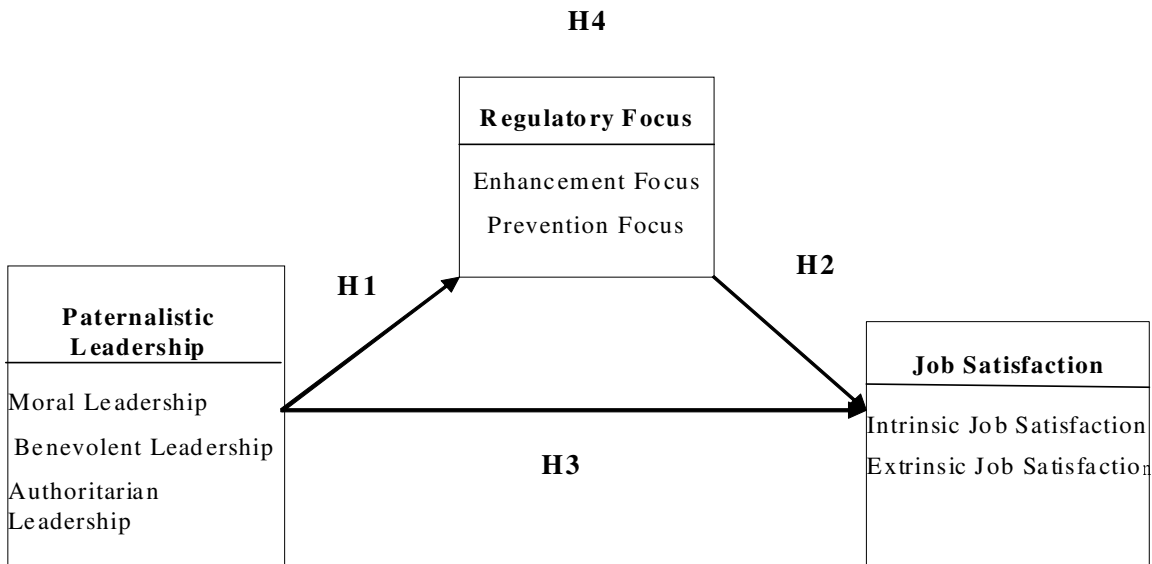


Figure 1. Research Framework

Definitions of variables and the measuring dimension

Regarding the scale of Paternalistic Leadership, the triad scale proposed by Cheng et al. (2003) was utilized. 15 questions, including five each for Moral Leadership, Benevolent

Leadership, and Authoritarian Leadership, were contained in the questionnaire. With Likert scale, the higher score showed the more behaviors with Benevolent, Moral, and Authoritarian Leadership. Higgins (1997, 1998) indicated that Enhancement Focus and Prevention Focus were two different psychological self-regulation systems that this study divided Regulatory Focus into Enhancement Focus and Prevention Focus for the measurement. The scale was revised from the one proposed by Lockwood et al. (2002). Total 9 questions were contained; and Likert scale was utilized for the measurement. The higher score revealed the higher Enhancement Focus of employees. Prevention Focus referred to the concerns of employees about living, job, and future that it tended to practice tasks, responsibility, and obligation, and avoid failure (Higgins, 1997, 1998). Revised from the scale of Lockwood et al. (2002), total 9 questions were included. The higher score showed the higher Prevention Focus of employees. Job Satisfaction referred to the overall feelings or evaluation towards the job that it was divided into Extrinsic Job Satisfaction and Intrinsic Job Satisfaction. Based on Minnesota Satisfaction Questionnaire (Weiss et al., 1967), the scale contained 19 questions, in which six related to Extrinsic Job Satisfaction and 13 to Intrinsic Job Satisfaction. With Likert scale, the higher score presented the higher Extrinsic Job Satisfaction and Intrinsic Job Satisfaction of employees.

Questionnaire survey and the structure of valid samples

The employees in Southern Taiwan Science Park were selected as the research subjects in this study. With stratified proportional sampling, 13 companies were selected from 144 ones, and each company was selected 46 employees. As some participants played the roles of both supervisors and employees, they were required to respond to the questionnaire from the aspect of an employee. Total 498 questionnaires were distributed and total 361 copies were retrieved after one month. Having deducted invalid ones, total 259 valid questionnaires were retrieved, with the retrieval rate 52%.

Research Outcomes

t-test

The t-test was utilized for testing the difference in the recognition of Paternalistic Leadership, Regulatory Focus, and Job Satisfaction among employees with different positions (supervisors, non-supervisors). The outcomes showed that the recognition of Benevolent Leadership ($t = -1.251$, $p = 0.212$), Moral Leadership ($t = -1.635$, $p = 0.103$), and Authoritarian Leadership ($t = 0.821$, $p = 0.412$) in Paternalistic Leadership, Enhancement Focus ($t = 1.624$, $p = 0.106$) and Prevention Focus ($t = -0.395$, $p = 0.693$) in Regulatory Focus, and Intrinsic Job Satisfaction ($t = 1.274$, $p = 0.204$) and Extrinsic Job Satisfaction ($t = 1.526$, $p = 0.129$) in Job Satisfaction did not appear differences. It was therefore considered appropriate to analyze both supervisors and non-supervisors in the model.

Confirmatory factor analysis

The dimensions of Paternalistic Leadership, Enhancement Focus and Prevention Focus in Regulatory Focus, and Job Satisfaction were proceeded KMO and Bartlett Test of Sphericity, and the KMO appeared 0.896, 0.860, 0755, and 0.864, respectively that they were suitable for Factor Analysis. The confirmatory factor analysis showed that the standardized path coefficient of all dimensions achieved significance ($p < 0.001$, γ : 0.605-0.935). The measurement of each dimension was then acceptable and with favorable structural reliability. In regard to the goodness-of-fit of each dimension, most indices conformed to the standard of $\chi^2/df < 3$, $RMR < 0.05$, GFI and $CFI > 0.90$, and $AGFI > 0.80$ (Bentler & Bonett, 1980; Bentler, 1990) that the goodness-of-fit was favorable in each dimension with good construct validity.

Confirmation of hypotheses 1-4

Multiple Regression Analysis was first applied to discussing the direct effects on Benevolent Leadership, Moral Leadership, and Authoritarian Leadership in Paternalistic Leadership, Enhancement Focus and Prevention Focus, and Intrinsic Job Satisfaction and Extrinsic Job Satisfaction Variable in Job Satisfaction. The hypotheses H1, H2, and H3 were tested, as in Table 3, 4 & 5; and, Hierarchical Regression was further utilized for testing the mediation effects of Enhancement Focus and Prevention Focus (H4), Table 6.

Regarding the test of H1, Moral Leadership appeared positive effects on both Enhancement Focus and Prevention Focus, but did not reach significance ($\beta = 0.069$, $p=0.446$; $\beta = 0.059$, $p=0.507$), Table 3. H1-1 and H1-2 therefore were not agreed. However, Benevolent Leadership showed notably positive effects on Enhancement Focus ($\beta = 0.205$, $p=0.017$) that H1-3 was agreed. Benevolent Leadership also presented remarkably positive effects on Prevention Focus ($\beta = 0.239$, $p=0.005$) that H1-4 was agreed.

Moreover, Authoritarian Leadership revealed significantly positive effects on Enhancement Focus ($\beta = 0.240$, $p=0.001$) and Prevention Focus ($\beta = 0.299$, $p=0.000$) that both H1-5 and H1-6 were agreed.

Table 3 Effects of Paternalistic Leadership on Regulatory Focus

Dependent variable Independent variable	Regulatory Focus		Tolerance
	Enhancement Focus	Prevention Focus	
Paternalistic Leadership			
Moral Leadership	0.069	0.059	0.452
Benevolent Leadership	0.205*	0.239**	0.497
Authoritarian Leadership	0.240***	0.299***	0.857
Degree of freedom	258	258	
R ²	0.068	0.094	
Regulated R ²	0.057	0.084	
F	6.226	8.859	
P	0.000	0.000	
Durbin-Watson	1.621	1.847	

Notes: 1. The data in the table are standardized β coefficients

2. * stands for $p<0.05$, ** for $p<0.01$, *** for $p<0.001$

Table 4. Effects of Paternalistic Leadership on Job Satisfaction

Dependent variable Independent variable	Job Satisfaction		Tolerance
	Intrinsic Job Satisfaction	Extrinsic Job Satisfaction	
Paternalistic Leadership			
Moral Leadership	0.281 ^{***}	0.231 ^{**}	0.452
Benevolent Leadership	0.193 ^{**}	0.256 ^{***}	0.497
Authoritarian Leadership	- 0.169 ^{**}	- 0.052	0.753
Degree of freedom	258	258	
R ²	0.295	0.227	
Regulated R ²	0.286	0.218	
F	35.502	25.027	
P	0.000	0.000	
Durbin-Watson	1.680	1.664	

Notes: 1. The data in the table are standardized β coefficients;
 2. * stands for $p < 0.05$, ** for $p < 0.01$, *** for $p < 0.001$

Table 5. Effects of Regulatory Focus on Job Satisfaction

Dependent variable Independent variable	Job Satisfaction		Tolerance	
	Intrinsic Job Satisfaction	Extrinsic Job Satisfaction		
Regulatory Focus	Enhancement Focus	0.046	0.223 ^{***}	0.857
	Prevention Focus	- 0.032	- 0.017	0.857
Degree of freedom	258	258		
R ²	0.004	0.052		
Regulated R ²	- 0.004	0.044		
F	0.543	6.961		
P	0.582	0.001		
Durbin-Watson	1.770	1.669		

Note: 1. The data in the table are standardized β coefficients;
 2. * stands for $p < 0.05$, ** for $p < 0.01$, *** for $p < 0.001$

In regard to H2, Moral Leadership appeared significantly positive effects on Intrinsic Job Satisfaction and Extrinsic Job Satisfaction ($\beta = 0.281$, $p < 0.001$; $\beta = 0.231$, $p = 0.005$) that H2-1

was agreed. Furthermore, Benevolent Leadership showed notably positive effects on Intrinsic Job Satisfaction ($\beta = 0.193$, $p=0.010$) and Extrinsic Job Satisfaction ($\beta = 0.256$, $p=0.001$), Table 4, that H2-2 was agreed. Authoritarian Leadership appeared remarkably negative effects on Intrinsic Job Satisfaction ($\beta = - 0.169$, $p=0.006$) and Extrinsic Job Satisfaction ($\beta = - 0.052$, $p=0.410$), which did not reached significance, that H2-3 was partially agreed.

In terms of H3, Enhancement Focus merely appeared remarkably positive effects on Extrinsic Job Satisfaction ($\beta = 0.223$, $p < 0.001$), but not on Intrinsic Job Satisfaction ($\beta = 0.046$, $p=0.497$), Table 5, that H3-1 was partially agreed. Moreover, Prevention Focus appeared negative effects on Intrinsic Job Satisfaction and Extrinsic Job Satisfaction, but did not reach significance ($\beta = - 0.032$, $p=0.636$; $\beta = - 0.017$, $p=0.800$) that H3-2 was not agreed.

In regard to the mediation effect in H4, Moral Leadership did not achieve significant effects on Enhancement Focus and Prevention Focus ($\beta = 0.069$, $p=0.446$; $\beta = 0.059$, $p=0.962$), and Prevention Focus did not reach remarkable effects on Intrinsic Job Satisfaction and Extrinsic Job Satisfaction ($\beta = - 0.032$, $p=0.636$; $\beta = - 0.017$, $p=0.800$) that it did not conform to the mediation standard established by Baron & Kenny (1986). H4-1, H4-4, H4-5, and H4-6 therefore were not agreed. Besides, Authoritarian Leadership did not reach significant effects on Extrinsic Job Satisfaction ($\beta = -0.052$, $p=0.410$) and Intrinsic Job Satisfaction ($\beta = -0.046$, $p=0.497$) that H4-3 was not agreed as well.

Table 6. Test of mediator

Variable	Mediator	Dependent variable			Tolerance
	Enhancement Focus	Extrinsic Job Satisfaction			
		M1-1	M1-2	M1-3	
Control variable					
Working experience	- 0.089	0.309*	0.110	0.327*	0.140
Gender	0.118	- 0.013	- 0.078	- 0.037	0.909
Age	0.184	0.006	0.155	- 0.116	0.138
Independent variable					
Moral Leadership	0.080	0.203**		0.189**	0.445
Benevolent Leadership	0.209*	0.314***		0.276***	0.466
Authoritarian Leadership	0.245***	- 0.321***		- 0.116	0.681
Mediator					
Enhancement Focus			0.189**	0.142*	0.785
Prevention Focus			0.053	- 0.044	0.754
Degree of freedom	258	258	258	258	
R ²	0.100	0.323	0.113	0.347	
Regulated R ²	0.079	0.307	0.095	0.326	
F	4.668	20.040	6.430	16.586	
P	0.000	0.000	0.000	0.000	
Durbin-Watson	1.650	1.866	1.708	1.818	
Sobel-test		p=0.039			

Notes: 1. The data in the table are standardized β coefficients;

2. * stands for $p < 0.05$, ** for $p < 0.01$, *** for $p < 0.001$

Regarding the test of H4-2, Enhancement Focus did not show remarkable effects on Intrinsic Job Satisfaction ($\beta = 0.046$, $p = 0.497$) that Benevolent Leadership could significantly predict Extrinsic Job Satisfaction ($\beta = 0.314$, $p = 0.000$) and Enhancement Focus ($\beta = 0.209$, $p = 0.016$), and Enhancement Focus could predict Extrinsic Job Satisfaction ($\beta = 0.189$, $p = 0.004$),

Table 6. When both Benevolent Leadership and Enhancement Focus were put into the equation,

the effects of Benevolent Leadership on Extrinsic Job Satisfaction reduced, $\beta = 0.2876$ ($p < 0.001$), which conformed to the mediation standard established by Baron & Kenny (1986), and Sobel-test ($p = 0.039$) also achieved significance that H4-2 was partially agreed. In other words, Benevolent Leadership could indirectly affect Extrinsic Job Satisfaction with the mediation of Enhancement Focus; the indirectly effect revealed 0.030 (0.209×0.142).

Conclusion

It was found that Benevolent Leadership and Authoritarian Leadership would positively affect Enhancement Focus, showing that the more behaviors of individual care and understanding were presented by supervisors with Benevolent Leadership, the higher Enhancement Focus of employees would be aroused (Brockner & Higgins, 2001; Kark & Van Dijk, 2007; Chou et al, 2006; Chen et al., 2008); the more despotism and instruction behaviors were shown by supervisors with Authoritarian Leadership, the higher Enhancement Focus would be generated as employees were inspired to approach the motive (Wu et al, 2002 ; Carver & Harmon-Jones, 2009). Besides, the empirical results also showed that Benevolent Leadership and Authoritarian Leadership would positively affect Prevention Focus. In this case, aiming at practical requirements, leaders could apply various leadership models at different time points and build distinct situations of Regulatory Focus so that the employees could be induced different

Regulatory Focus. The leadership effectiveness therefore could be better developed (Uhl-Bien & Arnaud, 2001).

Furthermore, it was discovered that Benevolent Leadership and Moral Leadership appeared positive prediction on Job Satisfaction, revealing that supervisors presented more behaviors of individual care, understanding, fair, and being an example could assist employees in promoting the acquisition of achievement, self-dignity, self-determination, and the interactive relationship with the supervisor and among colleagues as well as the satisfaction of working environment (Cheng et al., 2002; Cheng et al., 2003; Cheng & Wu, 2006). Besides, Authoritarian Leadership would negatively affect Intrinsic Job Satisfaction that supervisors showed more despotism and instruction behaviors would reduce the achievement, self-dignity, and self-determination of employees (Cheng et al., 2003; Ren et al., 2004; Wu, 2008). It was also found that arousing Enhancement Focus of employees could strengthen the feeling of Extrinsic Job Satisfaction. Such a result was identical to the findings of Tseng et al. (2008) and Tseng & Kang (2008). In other words, the higher individual Enhancement Focus was tended, the satisfactions with the rewards, the position, and the job would be enhanced.

Finally, the research outcomes showed that leaders could present Benevolent Leadership to inspire Enhancement Focus of employees and further reinforce their extrinsic satisfaction; supervisors could show more Benevolent Leadership to arouse Enhancement Focus of

employees with positive emotional experiences that the interactive relationship with the supervisor and among colleagues as well as the satisfaction with the job environment would be promoted.

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TRANSFER EFFECTS: EXPLORING THE RELATIONSHIP BETWEEN CELEBRITY AND BRAND

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Abstract

Celebrity endorsement is one of the most popular promotions of marketing communication. The purpose of this study is to understand the transfer effectiveness between celebrity and brand. Experiment 1 indicates that audiences perceive both images of a celebrity and a brand as being consistent/ inconsistent, and the positive/negative transfer effect did not occur. Experiment 2 shows a positive endorser image can benefit a negative brand image and a positive brand image can weaken a negative endorser image. Experiment 3 shows that when the same celebrity endorsement changed from high to low, brand awareness has a positive transfer effect; conversely, when the same celebrity endorsement changed from low to high, brand awareness has a negative transfer. The results show interesting transfer effects between celebrity and brand, and support most of the hypothesized relationships. These findings advance our understanding of

the pervasive influence of celebrity in today's society.

Keywords: Celebrity, brand image, meaning transfer, match-up hypothesis, cognition dissonance

Introduction

The phenomenon that one popular celebrity endorses multiple brands with different product categories is increasing in occurrence. In Taiwan, for example, Jay Chou endorsed 8-10 different brands with product types during one year. Celebrity endorsement strategies have been competitive power in nature and saturated to differentiated product and brand from competitors. Since there is heavy advertising clutter, there is almost no room for actual product differentiation in markets, as long as the right celebrity is found (Erdogan, 1999; Keller, 2008). However, whether one celebrity has effective transfer effects to match up multiple characteristics of different brands is questionable. In this study, transfer refers to the phenomenon in which endorser (positive/ high awareness) influence brand (negative/ low awareness) that is not directly addressed in a communication. The right celebrity endorsement is critical decision to a successful advertising strategy through the transfer of characteristic, image, and awareness.

The situation where a celebrity is involved in a negative information or event that damages his/her reputation or image can hurt the brand/product evaluations is often happens. The examples of Britney Spears and Tiger Woods are well known. Conversely, when the brand is

involved in negative information or event that damages its reputation or image can hurt the evaluations of celebrity is also happens. The examples of McDonald's and Coca-Cola are well known. Therefore, problems may arise where consumers evaluate the endorser and the brand decisions only on the perception of positive or negative information. Additionally, brand awareness has important effects on consumer decision making by influencing which brands enter the consideration and influence which brands are selected action (Keller, 1993; Macdonald and Sharp, 2000). This study also intends to understand the transfer way while the same celebrity endorses the brand from high to low brand awareness and from low to high brand awareness. Too little research is devoted to examining the possible transfer effectiveness between the celebrity and the brand.

Understanding the transfer effectiveness between celebrity and brand has been an important issue for both academics and practitioners (e.g., McCracken, 1989; Kamins, 1990; Louie and Obermiller, 2002; Elina and Leila, 2010; Ilicic and Webster, 2011). The purpose of this research is therefore three-fold: first, this study identifies the beneficial transfer effect between the endorser and the brand/product depends on the image and characteristic; second, this study is to explore the effect of image transfer between the endorser and the brand; third, this study is to explore transfer effect when the same celebrity endorses the brand from high to low awareness and from low to high awareness. A multi-theory approach involved associative

network theory, meaning transfer theory, match-up hypothesis, and cognitive dissonance theory, is taken concerning transfer phenomenon between endorser and brand to assess the effect of the advertising communication.

Theoretical Background and Hypothesis Development

Characteristics: Celebrity and Brand Match-Up

Celebrity endorsers share the well-know characteristics of recognition, style, attractiveness, and popularity, and each celebrity embodies his or her own unique image characteristics into the brand (McCracken, 1989; Kamins, 1990; Ohanian, 1990). Consumers are often observed to idolize celebrities and emulate their styles and behaviors. They might view some of the images or meanings the celebrities represent to be relevant to their ideal self-image and purchase brands endorsed by the celebrities in hopes that they become similar to the celebrities by consuming these brands. In this view, celebrity's images play a pivotal role in the endorsement process (Choi and Rifon, 2007). Conversely, the characteristics of a brand usually come from multiple ways, for example, the kinds of users, chief executive officer, packaging, product category associations, brand name, symbol, advertising message and style, price, distribution channel, and so forth (Aaker, 1997; Batra and Homer, 2004).

Advertising is always effective when celebrity and brand have attributes that matches. According to the match-up hypothesis (Kamins, 1990; Kamins and Gupta, 1994), focus on an

appropriate fit between the celebrity and the brand being endorsed. By pairing a brand with a celebrity, a brand is able to leverage unique and positive secondary brand associations from a celebrity and gain consumer awareness, transfer positive association to tie to the celebrity into the brand, build brand image and ultimately enhance the endorsed brand's equity (Keller, 2008; Ilicic and Webster, 2011).

The match-up hypothesis is supported when highly relevant characteristics of the endorser are consistent with highly relevant attributes of the brand (McCracken, 1989; Misra and Beatty, 1990; Ilicic and Webster, 2011). While one celebrity may be considered an appropriate endorser for one brand, he/she may be completely wrong for another based on the consumer's perception of her/his distinctive image (McCracken, 1989). For example, Kamins and Gupta (1994) found that, congruency of endorser and brand resulted in positive attitude towards the brand, and incongruence led to negative brand evaluations. Advertising is more effective when the endorser and brand/product have attributes that mutually match (Louie and Obermiller, 2002). No matter celebrities or brands bring their own distinctive attributes to an advertisement and create and enhance their un/common characteristics to each other. Therefore, we propose the following hypotheses.

H1: Consumers perceive the characteristics of an endorser and a brand as being congruent, this has a positive effect.

H2: Consumers perceive the characteristics of an endorser and a brand as being incongruent, this has a negative effect.

Image and Awareness

Celebrities are individuals who are symbolic icons, and transfer their symbolic meaning to the products they endorse in advertising (McCracken, 1989). Celebrities' popularity and recognition motivates the consumer's acceptance or desire to pursue these celebrities' personalities, lifestyles, appearances, and behaviors (Choi and Rifon, 2007). Endorsers bring their own distinctive images to an advertisement and its associated brand and can create, enhance, and change brand images. That is, when a celebrity endorses a product, the meaning developed around a particular endorser will transfer to a company, brand, or product (Goldsmith et al., 2000; Amos et al., 2008).

Brand image has been defined as the perceptions and associations held in consumer memory, and brand knowledge as consisting of a brand node in memory to which a variety of associations are linked (Keller, 1993). Brand image usually come from multiple sources, for example, the kinds of users, chief executive officer, packaging, product category associations, brand name, symbol, advertising message and style, price, distribution channel, and so forth (Aaker, 1997; Batra and Homer, 2004). The research of Keller (1993) indicated when the brand was associated with the endorser, the brand associations could be influenced.

Image Transfer

The theory of meaning transfer process has suggested that the effectiveness of an endorser depends on the meanings and associations he brings with him to endorsement process from other roles of his life (McCracken, 1989). Escalas and Bettman (2009) pointed out, the symbolic meanings associated with a celebrity are transfer into the brands the celebrity endorses, and in turn, these meanings are then transferred from the celebrity to consumers through selecting brands that communicate their self-concept, ultimately forming a self-brand connection. The existence of reciprocal meaning transfer would suggest that celebrity endorsement should be considered as a brand alliance where meaning can transfer from either partner to the other (Elina and Leila, 2010). Celebrities and brands both represent nodes which initially are unconnected but linked over time through the endorsement process (Till and Shimp, 1998).

Problems may arise when the celebrity/brand is involved in an incident that change or even damage the celebrity/brand images or reputations. At sometime, Britney Jean Spears and Tiger Woods are well-know the examples of negative image celebrity, and McDonald is the examples of negative image brand. Different from previous studies, a risky event resulted in a bad image can be changed. The use of negative endorser or brand might be a useful strategic mean in accomplishing this very goal. Base on the meaning transfer and cognitive dissonance, this study proposed the celebrity with positive image was paired with the brand with negative

image, the positive transfer effect from the celebrity to the brand. Through a reasonable process after image cognition inconsistent, the endorser transfer itself positive value to the brand which can lessen its harmful image. In contrast, the brand with positive image was paired with the celebrity with negative image, the positive transfer effect from the brand to the celebrity.

Through the process about the brand it value transferring to the endorser which can reduce its risky image. Elina and Leila (2010) pointed out reciprocal meanings of transfer can occur not only from the endorser to the brand, but also from the brand to the endorser. When images conflict between celebrity and brand, we emphasize positive lessen negative transferring ways:

H3: The celebrity with the positive image endorses the brand with the negative image, the celebrity has the positive transfer effect to the brand.

H4: The celebrity with the negative image endorses the brand with the positive image, the brand has the positive transfer effect to the celebrity.

Brand Awareness Transfer

Without brand awareness happening, no other communication effects can happen (Macdonald and Sharp, 2003). Keller and Davey (2001) described that building brand awareness as the way of ensuring potential customers know the categories in which the brand competes. Brand awareness can be considered one of the key pillars of consumer-based brand equity (Aaker, 1991). Brand awareness is not always about the brand name but can be about the color,

shape of the packaging or other associated distinctive brand features (Rossiter and Percy, 1991).

Accordingly, brand awareness has important effects on consumer decision making by influencing which brands enter the consideration and influence which brands are selected action (Keller, 1993; Macdonald and Sharp, 2000). This study intends to understand transfer effect, when the same celebrity endorses the brand with high to low brand awareness and low to high brand awareness.

Cognitive dissonance theory is important psychological mechanism for explaining the basis for changes in attitude, and suggests that when an individual has two incompatible perceptions, beliefs, values or concepts, the individual experiences inconsistency. The individual will try to keep this inconsistency to a minimum, because he or she wishes to create consistency in order to reduce the uneasy feeling of imbalance (Festinger, 1957). Another extension of this study would be to apply cognitive dissonance theory into, when the same celebrity endorsement with from high to low brand awareness, consumers have a positive offset; in contrast, when the same celebrity endorsement with from low to high brand awareness, consumers have a negative offset. A positive offset means that a low-level brand's image benefits from consumers' awareness of the high-level brand (positive transfer effect), while a negative offset indicates that a high-level brand suffers as a result of perceptions of the low-level brand (negative transfer effect). Therefore, this study has put forward the following propositions:

H5: The same celebrity endorsement change from high to low brand awareness, this leads a positive transfer effect.

H6: The same celebrity endorsement change from low to high brand awareness, this leads a negative transfer effect.

Methods

Sample and Procedure

To conduct an experimental design to collect the research data and test the hypotheses. A convenience sample from college students is considered because of sample homogeneous. Before the main experiment, pre-test is undertaken to select the car brands and celebrities. 150 questionnaires were collected from participants. Next, the main experiment included three experiments which were divided into ten situations. We designed the 10 advertising situations and collect 30 questionnaires for each part. Total 300 questionnaires were collected. The researcher began with a brief introduction about the objective of the experiment and thanked for every student for involvement in the experiment. Participants were told they would view a message of advertisement and then take about 20 minutes to complete an anonymous survey. They were also informed not to discuss the message with others. To encourage participants to become involved in the experimental situation, a gift was provided to thank each respondent for participating in the experiment.

Pre-Test: Selection of Celebrity And Brand

Pre-test is undertaken to select the car brands and celebrities that was conducted our experimental situations. Five car brands such as Toyota, Honda, Nissan, Ford and Mazda were selected by this study. Then, develop the image scale to measure the image of the brands. Besides, this study also selected five artists of Na Dou, Aniki, Matilda Tao, Jacky Wu and Hu Gua. This study used the brand personality scale that Aaker (1997) proposed to measure the images of the endorsers and brands respectively.

The Main Experiments

Experiment 1

Experiment 1 is to manipulate the image of the endorser and brand by itself. If customers perceive the characteristics of excitement of an endorser and a brand as being consistent/ inconsistent, this would have a positive/ negative transfer effect. Experiment 1 context was showed on Table 1. The brand evaluations scale proposed by Kirmani, Sanjay & Bridge (1999) and modified some questions as brands and endorsers' scale questions. The questionnaires included two parts: (1) the scale that the participants evaluated the endorser and brand before they watch the advertisement; (2) the scale that the participants evaluated the endorser and brand again after they watch the advertisement.

Experiment 2

Experiment 2 is to manipulate the positive or negative image by endorser and brand.

Experiment 2 context was showed on Table 1. When the endorser with the positive image endorses the brand with the negative image, then the endorser have the positive transfer effect to the brand/ when the endorser with the negative image endorses the brand with the positive image, then the brand will have the positive transfer to the endorser. The manipulate variables were celebrity and brand with positive image or negative image, avoiding to damage endorsers and brands' reputation, thus this study used the virtual endorsers and brands. We proposed two virtual endorsers (Amy and Mary) and two virtual brands (FASSA and RASSA), then wrote a stories to describe those endorsers and brands with the positive image or negative image. The questionnaires also included two scales which before and after the participants watch the advertisement.

Experiment 3

Experiment 3 is to manipulate the way of celebrity endorsement with high to low and low to high brand awareness. Experiment 3 context was showed on Table 1. When the same celebrity endorsement changed from high to low brand awareness, this would have a positive transfer effect; and when the same celebrity endorsement changed from low to high brand awareness, this would have a negative transfer. This study modified scale who Keller (1993) proposed the brand awareness. Besides, the questionnaire divided into two parts, the first part was the evaluation

scale that the participants evaluated the endorser and brand before they see the advertisement, the second part was the evaluation scale that the participants evaluated the endorser and brand again after they saw the advertisement.

Table 1. Experimental contexts

Experiment 1		
	Celebrity/High-excitement	Celebrity /Low-excitement
Brand/High-excitement	Positive transfer effect	Negative transfer effect
Brand/Low-excitement	Negative transfer effect	Positive transfer effect
Experiment 2		
	Positive celebrity image	Negative celebrity image
Positive brand image	--	Brand has a positive transfer effect on the celebrity.
Negative brand image	Celebrity has a positive transfer effect on the brand.	--
Experiment 3		
Celebrity endorsement		Transfer effect
From High to Low brand awareness		Positive
From Low to High brand awareness		Negative

Results

Reliability of Questionnaires and Manipulation Check

This study proposed five endorsers and five brands, those Cronbach's α levels were $> .70$. Thus, the reliability results of the endorsers and brands' image were adequate for three experiments. According to the analysis indicated that the average of Ford is 3.55, Honda is 4.00, Mazda is 4.19, Toyota is 2.78 and Nissan is 2.76. The F value is 16.407 and p-value is .000. The

five brands all had significant difference. Mazda and Nissan were selected. Used Mazda as the brand with high-excitement image and used Nissan as the brand with low-excitement image. In addition, the average of Aniki is 4.18, Matilda Tao is 4.03, Na Dou is 3.36, Jacky Wu is 3.08 and Hu Gua is 2.55. The F value is 19.747 and p-value is .000. The five endorsers all had significant difference. Therefore, this study selected Aniki and Hu Gua as the research tools. Used Aniki as the endorser with high-excitement image and used Hu Gua as the endorser with low-excitement image.

Analysis and Results

Experiment 1

The participants were asked to answer two questionnaires of before and after they watched the advertisement. Experiment 1 manipulated the celebrities and brands with the same image or not, there were $2*2=4$ experimental situations be designed. According to pair-t test analysis that the p-value of the four situations were $< .05$, the results did not have significant difference, and thus H1 and H2 were rejected (see Table 2). That is, when audiences perceived the image of excitement of an endorser and a brand as being consistent, they did not have a positive transfer effect. Also, when audiences perceived the image of excitement of an endorser and a brand as being inconsistent, they did not have a negative transfer effect.

Table 2. The result of Experiment 1

Situations	Average of brands	p-value	Average of endorsers	p-value
1-1 High brand image vs. High celebrity image	1st Mazda 3.486 vs. 2nd Mazda 3.480	.952	1st Aniki 3.712 vs. 2nd Aniki 3.742	.854
1-2 High brand image vs. Low celebrity image	1st Mazda 3.5333 vs. 2nd Mazda 3.367	.027	1st Hu Gua 2.950 vs. 2nd Hu Gua 2.893	.586
1-3 Low brand image vs. High celebrity image	1st Nissan 3.426 vs. 2nd Nissan 3.314	.087	1st Aniki 3.583 vs. 2nd Aniki 3.660	.583
1-4 Low brand image vs. Low celebrity image	1st Nissan 3.312 vs. 2nd Nissan 3.256	.366	1st Hu Gua 2.838 vs. 2nd Hu Gua 2.912	.481

Experiment 2

Experiment 2 manipulated the endorsers and brands with the positive image or negative image, there is the 2*2 experimental design. The participants were asked to answer two questionnaires both before and after they watched the advertisement. Experiment 2 was divided four parts (see Table 3). Before the formal experiments, this study proposed two virtual endorsers (Amy and Mary) and two virtual brands (FASSA and RASSA), then wrote the stories to describe those celebrities and brands with the positive image or negative image. First, the average of FASSA and Amy are > 3, this result indicated that participants considered FASSA and Amy were with the positive image. Second, the mean of RASSA and Mary are < 3, this result indicated that participants considered RASSA and Mary were with the negative image.

Table 3. The result of Experiment 2

	Situations	Mean of brand	p-value	Mean of celebrity	p-value
2-1	Positive brand image vs. Positive celebrity image	1st Fassa 3.491 vs. 2nd Fassa 3.726	.007	1st Amy 3.573 vs. 2nd Amy 3.770	.045
2-2	Positive brand image vs. Negative celebrity image	1st Fassa 3.459 vs. 2nd Fassa 3.201	.007	1st Mary 2.377 vs. 2nd Mary 2.850	.000
2-3	Negative brand image vs. Positive celebrity image	1st Rassa 2.671 vs. 2nd Rassa 3.274	.000	1st Amy 3.667 vs. 2nd Amy 3.415	.005
2-4	Negative brand image vs. Negative celebrity image	1st Rassa 2.290 vs. 2nd Rassa 2.594	.000	1st Mary 2.182 vs. 2nd Mary 2.487	.001

The experiment 2-2 indicated Mary's mean of second part was 2.85 and mean of first part was 2.377. The mean of the second part was higher than first part and the p-value < .05, and they had significant difference. The result indicated that the brand with positive image have the positive transfer effect to the negative endorser image. Next, the Experiment 2-3 indicated the RASSA's mean of second part was 3.274 and mean of first part was 2.671. The second part was higher than the first and the p-value < .05, they had significant difference. The results showed that the positive endorser image have the positive transfer to the negative brand image. Thus, H3 and H4 were supported.

Experiment 3

Experiment 3 manipulated an endorser change from advertising different awareness brands. The participants were asked to answer two questionnaires both before and after they watched the advertisement. Experiment 3-1 was the same celebrity endorsement converts from high to low brand awareness (see Table 4). Experiment 3-1 indicated the Geely's mean of second part was 3.026 and mean of first part was 2.644. The second was higher than the first and the p-value < .05, they had significant difference. That is, when the same celebrity endorsement changed from high to low brand awareness has a positive transfer effect. Next, Experiment 3-2 was the same celebrity endorsement converts from low to high brand awareness. The Experiment 3-2 indicated the Benz's mean of second part was 3.593 and mean of first part was 4.014. The mean of second part was lower than first part and the p-value < .05, they had significant difference. When the same celebrity endorsement changed from low to high brand awareness has a negative transfer effect, and H5 and H6 were accepted.

Table 4. The result of Experiment 3

	Situations	Mean of high brand awareness	p-value	Mean of low brand awareness	p-value
3-1	Celebrity endorsement converts from low to a high brand awareness	1st Benz 3.951 vs. 2nd Benz 3.503	.000	1st Geely 2.644 vs. 2nd Geely 3.026	.000
3-2	Celebrity endorsement converts from high to low brand awareness	1st Benz 4.014 vs. 2nd Benz 3.593	.000	1st Geely 2.0811 vs. 2nd Geely 2.544	.000

General Discussion and Conclusions

This study extends prior works by examining the existence of transfer effects between celebrity and brand. The results showed an interesting transfer of the celebrity on the brand and the brand on the celebrity, and support most of the hypothesized relationships through empirical investigation. To our knowledge, our research would help in understanding the transfer effects between endorser and brand and developing appropriate celebrity endorsers for brand image and awareness.

The findings of Experiment 1 indicated that when audiences perceived both images of a celebrity and a brand as being consistent, it did not occur the positive transfer effect, in contrast, when audiences perceived both images being inconsistent, it did not occur the negative transfer. Although prior studies have investigated the transfer of positive meanings from the celebrity to the brand (e.g., Choi and Rifon, 2007); and the transfer of negative meanings from the celebrity endorser to the brand (e.g., Till, 1998; Till and Shimp, 1998). Also, few studies have investigated the transfer of meanings from the brand to the celebrity (White, Goddard, and Wilbur, 2009; Elina and Leila, 2010). However, these studies about transfer way were unclear.

Based on the findings of Experiment 2, a positive endorser image can benefit a negative brand image. Different from the findings of prior studies, for example, Till (1998) and Till and Shimp (1998) have investigated the transfer of negative meanings and associations from the

celebrity to the brand. In the meta-analysis study by Amos et al. (2008), positive endorser image can transfer to the product/brand and negative endorser information transfers to the product/brands as well. For the brand management, this study suggests that the endorser used in an advertisement was identified to play important roles in determining brand image. It is important and necessary that a positive endorser icon employed in advertising campaigns may improve brand image for the brand.

The findings of Experiment 2 also showed that a positive brand image can weaken a negative endorser image. In the findings of Elina and Leila (2010), meanings were actually transferred from the brand to the celebrity, but inconsistent with Amos et al. (2008), which negative endorser information transfers to the product/brands. This may reveal the tendency to psychologically distance from the suffering of a low blame person by downgrading him/her (Louie and Obermiller, 2002). Namely, audiences were to avoid the consideration of negative event can fall on innocent people to lower their perceptions of the endorser. For the endorser, the brand's image used in an advertisement may benefit negative endorser image. According to Priester and Petty (2003), under certain conditions, the use of an untrustworthy endorser about whom recipients have some suspicion may be advantageous. For brand management, it is sensible for marketers to be interested in establishing thoughtful attitudes toward the brand that are able to persist, resist, and guide behavior. The use of an untrustworthy endorser might be a

useful strategic tool in accomplishing this very goal (e.g., Priester and Petty, 2003). While the brand forms partnerships with the celebrity through an endorsement association, they should be prepared to deal with negative event.

Experiment 3 indicated that when the same celebrity endorsement changed from high to low brand awareness have a positive transfer effect, conversely, when the celebrity endorsement changed from low to high brand awareness have a negative transfer. The findings were based on cognitive dissonance theory, in which people usually keep inconsistency to a minimum in order to reduce the imbalance feeling. Although previous studies have not been identified these kinds of transfer effects through high/low brand awareness, the finding of this study suggest that, the low brand awareness should seek for the high endorser awareness would have better transfer effects. In contrast, the high brand awareness should not seek for the low endorser awareness would have worse transfer.

Results from this study showed an interesting transfer relationship between a celebrity and a brand. However, several theoretical issues remain unresolved. First, the nature of encoding in a consumer's mind that guides their processing of information between the endorser and the brand is not clear. Second, the process of transfer occurs in one's mind has not been investigated by this research. Third, the characteristics of a negative image that cause transfer to occur might vary in many different ways (e.g., type, intensity, consequences) and have not been the focus of

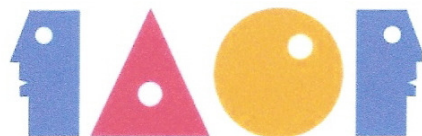
our research. All these research issues can be addressed for future research which would decrease knowledge gaps of transfer phenomena between celebrity and brand.

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BRAND INTEGRITY, ADVERTISING AND MARKETING ETHICS
AS WELL AS SOCIAL RESPONSIBILITY

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Abstract

In this study, brand integrity and social responsibility are considered. In addition, criticism of advertising ethics and social responsibility are addressed. This is followed by an examination of marketing ethics and social responsibility. An extensive bibliography on these topics is also provided.

Key Words: Brand Integrity, Advertising and Marketing Ethics, Social Responsibility.

Brand Integrity and Social Responsibility

Brands are a part of our daily lives, and are essential to the way we identify our products. Brands have a direct interface with consumers, and are extremely valuable to the companies that nominally own them. Some of the world's most recognized brands include Microsoft, Coca-Cola, GE, IBM, Disney, Intel, Nokia, McDonald's, Marlboro, and Toyota, to name a few. People

from all over the world come in contact with one or more of these brands and are affected by their use. We want to understand more deeply and more broadly the ecological and social impact of brands, in general. This will involve looking at global supply chains, global trade problems, the interface between companies, government, and nongovernmental organizations, and the ecology of brands. One perspective of brands draws a picture of a complex network of relationships among interest groups, ideas, and products. Consumers create loyalty to brands through the establishment of love marks or superbrands. Values are at the heart of any brand, and brand values are not to be understood simply as an “attachment” to specific goods or services, but rather as the driving force behind what the brand is able to become. Trustmarks begin after brands; lovemarks come after trustmarks. Companies develop strategies for making the most money by influencing the development of loyal consumers who will use their products loyally during their lives. Therefore, having a long-term relationship is better than having a trusting relationship. For example, customers may prefer the taste of Pepsi, but end up buying Coke by preference. Brand marketing theory involves lifestyle, identity, security, and freedom. The highest position a brand is able to reach is that of brand Religion within the market. Companies are the nominal owners of brands, but greater monitoring is exercised by customers and other stakeholders. Additionally, companies soon realize their mistakes when they corrupt their own brands. A new approach to social responsibility is needed to move the emphasis from the

company to society as a whole. The method to do this is to examine those things that affect global brands and that connect all of us every day. This does not relieve the company of its responsibilities to augment total stakeholder value; i.e., their responsibility to provide financial value to the shareholder, and central to this view is a new comprehension of nongovernmental public action through activism, customer choice, stakeholder engagement, and passive resistance.

The most highly valued customer brands are worth more than the companies that own them. McDonald's, Coke, Microsoft, and Mercedes are some of the most widely recognized global brands. Practice and theory of responsibility have tended to concentrate on the responsibility of companies. The best brands enjoy loyalty. Management is at the heart of the most profitable retail companies. The supply chain for Unilever's Dove soap, for example, stretches from poor palm oil farmers to customers globally. From Unilever's Dove soap, we are able to draw a rich picture of complex relationships involving stakeholders, the raw materials, and the use as well as disposal of the product via manufacturing, packaging, processing, retailing, marketing, governance, and international trade. Unilever sources the raw material from a variety of locations, manufactures in some places but not in others, and sells globally. This all depends on international trade regulations. In 2000, Unilever was one of the first corporations to associate itself with the United Nations Global Compact (UNGC). Principle 1 of the UNGC states: "Businesses are asked to encourage and respect the protection of international human

rights” Principle 2: “Businesses are demanded to make sure their own companies are not complicit in human rights abuses”. The question becomes at what point do responsibilities become societal rather than corporate? Does knowing that human rights abuses are being committed in a territory in which a firm has operations automatically implicate that company in those abuses? Brands possess diffuse ownership and multiple reputations. The ubiquity of brands across global socio-ecological and socioeconomic groups has been at the forefront of the development of the global economy, from Dove soap to Coke to Toyota cars. Just as interesting is global social networking, where it is common and possible for individuals to connect around a brand or an idea, and to disperse as quickly as they congregate. The web of life has become alive and has been significantly democratized by communication technology. Therefore, the future of nongovernmental public action is being developed online through idea groupings and through collective purchasing choices of customers worldwide. Due to this, brand integrity has become a much more prominent problem. For the United Nations, the Olympic Game, and the BBC, the implications are clear: the public, in the shape of customers, activists, workers, and others, now have a greater awareness of the values that a special brand or corporate entity embodies. They are expanding their awareness of all aspects of products from sourcing to manufacturing, and from use to disposal.

Criticism of Advertising Ethics and Social Responsibility

Advertising deals with subjective as well as constant environmental pressures. The pressures are sometimes shaped by advertising, and can even shape advertising, but the specific social effects of advertising are not yet fully understood. However, these effects are inescapable because the character of advertising is pervasive, appearing in many forms in diverse media, and having various social consequences. Advertising is almost always evaluated by how much market efficiency it produces or how much profit it generates rather than how it benefits or harms society. Advertising plays on emotions, exploiting anxieties, and uses techniques of intensive persuasion that leads to manipulation. For example, some criticisms of advertising are as follows:

A. Influences on Human Behavior

- Using susceptible segments of society such as the elderly, the poor, the mentally ill, the immature, and the very young
- Lowers morals, values, and standards
- Promotes materialistic lifestyles and values
- Cause consumers to buy things they otherwise would not

B. Advertising Content

- Manipulative suggestions
- Negative appeals

- Sexual suggestiveness
- Insensitive argument
- Negative stereotypes
- Falsity
- Poor taste
- Insulting

C. Product Advertised

- Hygiene products and personal care
- Medical products
- Condoms and sexual products
- Alcohol
- Tobacco

D. Advertising Exposure

- Intrusive
- Repetitious

According to its critics, advertising has negative social consequences: They can be cynical, materialistic, selfish, irrational, sexually preoccupied, socially competitive, and can promote powerlessness. In response, advertising's defenders argue that advertisements are in

harmony with society by showing social conditions, and by using cultural values and symbols that are accepted by the target audience.

Consumers complain about advertising when it is offensive or annoying, such as when it contradicts the personal experience with the advertised product, when it is disturbing or provides an unrealistic presentation, or when methods show bad taste in content message. In fact, there were very little ethical practices in advertising before the beginning of the 20th century. Nowadays, ethical systems in advertising are dependent upon guidelines, formal regulations, organizational procedures, and human judgment of what is wrong and right. The following list indicates some of the issues and concerns regarding advertising.

- Advertising creates and promotes desires for goods.
- Whenever an advertising claim concerns misleading or false information, the enterprise ought to advertise this fact until customers are informed about it.
- Advertising does not give consumers enough information about the product being advertised.
- Advertising appeals to audiences' emotions rather than their intelligence.
- Commercials take advantage of children.
- Advertising is an unreliable source of information about the performance and quality of products.

- Advertising for the product is not truthful.
- Advertising enterprises ought to tell the bad points or limitations of their products as well as the good points and advantages.
- Advertisements present a false picture of the product advertised.
- Advertising is not important.

Ethical standards in advertising are bringing about a number of results: They are creating honest, non-misleading, and socially desirable advertisements, and are helping to eliminate advertising for products which are unhealthy, useless, unneeded, or unethical. They are also creating fairness for many parties involved including the media and suppliers, management and workforce, and other agencies. Nowadays, advertising practitioners realize ethical problems and possess institutional procedures and standards to deal with unethical practices. Long-term business success encourages most individual advertising practitioners and their agencies to operate in an ethical manner. As a result, advertising is becoming less misleading and more honest.

Marketing Ethics and Social Responsibility

The marketing concept is an attempt to concentrate on the needs of consumers as well as the responsibilities of marketers to attend to the ethical and social need of customers. Societal marketing defines marketing as the societal process of supplying consumptive needs through

distributive systems, and is composed of participants who interact under technical and ethical economic constraints to create the transactions or flows that result in exchange and consumption. In this sense, the marketing concept and the relationship between the responsibilities of the company to society become important. Marketing professionals are therefore expected to not only find the ends of consumption and exchange, but also to use the technology of marketing in ethical manners within the economy. Governments serve to encourage workers, competitors, suppliers, and special public interests, and sense a moral responsibility towards customers. Up to now, marketing as a business activity has had a negative ethical image, and has failed to serve the needs of society.

However, marketing functions are in the unique position to match the needs of consumers with the productive possibilities of the company. Social responsibility reflecting collective needs and ethical conduct, rather than being an externality imposed on the company, shows marketing practices that represent a keen awareness of the direct connection that marketing has with society.

The relationship between social responsibility and marketing ethics has been inadequately recognized up to now. Among the key problems in need of resolution is the integration of ethical value with the principles of profitability and efficiency. Marketing is an organized discipline that plays a role in the production and the nature of customer choice while

emphasizing cost/benefit efficiency and wealth maximization. Marketing is a process of society that matches the demands of a consuming public with the products or services available within practical constraints. Marketing is a fundamental function of society and, therefore, legal restraints need to be recognized and respected. In this way, marketing is society's mechanism for fulfilling needs in terms of the demands of its environment. Marketers experience trouble when this fundamental interconnectedness with society, or so-called social responsibility, is forgotten. Ethics of behavior require marketing decision makers that have the capacity to make decisions that maximize wealth. The economic realities of the market match production with the demands of consumption for a profit. A distinction is made between social responsibility and business ethics, which can be seen through an application of a society's interpretation of ethics. While ethics is concerned with the moral, social responsibility is concerned with the relationships between an organization and its environment relative to perceived societal welfare, and wealth emanates from household management and retail trade.

Customer expectation and perception with regard to commercial goods along with the image of the firm offering the goods are all apposite concerns of the marketing department. Marketing serves well when it accurately depicts its segments, and in fact, it is the marketing department which integrates the needs of the public with the purpose of the business. Its task is to sell to the public, and to inform and educate the organization about "the goodness" which is

required in order to do business and to maintain and gain the esteem of the public. In this perspective, marketing is an intermediary function between the organization and its public. The concept of social responsibility is of critical importance for marketing. Since ethical and successful marketing must represent the interests of the customers, unethical practices are indicative of a marketing system which tries to maximize corporate wealth at the expense of the public. Advertising and public relations as branches of marketing try to communicate the role of the public to the rest of the company. Unethical business practices violate public trust, and good consumers shy away from products. Marketing reality is a social reality and therefore demands that a broader set of values be integrated within it. When a sales department switches its selling tactics to increase revenue, they often do so at the expense of the product being purchased. Concerning the issue of social responsibility from a marketing perspective, the relationships that businesses have with the many facets of the public looms paramount. Marketing must concentrate on the immediate consumers, and realize the consequences of marketing actions on the workforce, the environment, and the general public. By realizing the numerous points of contact marketing has with society, the need for a set of social contracts and ethical standards between its public and the company becomes more readily apparent. Cooperation ought to begin with agreements on what is valuable and what is good, for the individual, the company, and society. This necessitates the development of ethical values between the company and the public.

An ethical sense ought to refer to the immediate means-end relationship of the business's purpose. The behavior of the company becomes part of a larger means-end relationship of societal interests. The standards of ethical persons and the marketing decision maker need the development of decision rules which are able to narrow the differences between the two. Marketing is a means to arrive at a better life in terms of products and services delivered to society's members. It must be clear that the marketing process alone does not determine a better life. The problem of cooperation between society and marketing is a mutual responsibility which balances benefits and costs. The directions of company from inputs to outputs to profits can haphazardly create by-products such as pollution, or can prevent the creation of great wealth for society. A perspective on marketing is needed to bridge the gap between the need to formulate ethical standards and to develop marketing practices within the discipline.

Good marketing will naturally incorporate social responsibility in its practices. If marketing is able to be more productive in developing socially responsible services and goods, the whole of society will be better for it. Marketing produces goods and services for society. It also has a direct impact on purchase processes that ultimately determine a society's quality of life (QOL). It is clear that marketing plays a very critical role in the well-being of a society --- marketing generates QOL. Customers have multiple options yet are also less aware of the complex needs of companies emerging on the market. In some industries, it is almost impossible

to know the rationale behind business decisions. Business decisions in the modern market are extremely numerous, and complex. Additionally, it is impossible to assume that business decisions are perfectly rational. Nowadays, customers have a tremendous number of choices, yet most of the products are complex and many food products are dangerous with hazardous long-term effects. However, information is neither completely available nor easily accessible, which often prevents businesses and consumers from making rational decisions. Nowadays, the market has many economic and legal entry barriers, yet in other industries such as customer service, entry is rather easy, but survival is extremely difficult.

The marketing process is responsible for the distribution and exchange of goods and services within a society. As a consequence, this process provides a certain QOL for the whole society. Marketing can be used to enhance the well-being of only a select few or of the whole society. Major causes of marketing failures are as follows:

- Internal marketing information processes
- Internal product-related processes
- Overall maladaptive marketing philosophy
- Inadequate marketing inputs
- Inappropriate forms of energy inputs, raw material, and other resources
- Inadequate levels of raw material, other resource inputs and energy

- Internal marketing information: Wrong product priority, misallocation of the company's resources
- Internal product processes: Waste of resource, dysfunctional and dangerous products
- Maladaptive marketing philosophy: Supply and demand mismatch, waste of resources
- Inadequate market information: Supply and demand mismatch, dysfunctional products, waste of resources
- Inappropriate forms of inputs: Dangerous short and long term genetic and biological impacts, adverse environmental impact
- Inadequate inputs: Dangerous products, dysfunctional or wasteful products

Conclusions

Inadequate raw materials and energy resources in production and distribution may produce less satisfactory services and goods, or a shortage of services and goods entirely. Moreover, products may be dangerous, dysfunctional, or wasteful. By utilizing less than adequate inputs, American auto tire manufacturer Bridgestone/Firestone produced a flawed tire and had to recall nearly 4 million tires in 2000. Using inputs that must not be used due to safety reasons, be it saccharine, Red Dye No.2, benzene in Perrier, or poison in Bon Vivant soups,

causes customer dissatisfaction and serious health hazards and diseases, resulting in a negative image for the company, product recalls, and political pressures as well as environmental threats. Insufficient information may cause the production and delivery of unneeded, unnecessary, low-quality, or harmful goods. At one time Ford Motor Company possessed insufficient information about the Pinto's rear compartment's tendency to be explosive, which caused hundreds of fatal accidents and caused damage to the firm's profitable image. Additionally, a maladaptive marketing philosophy would reveal an organization's inability to respond to higher and external needs prevailing in the society, for example, when marketing executives' believe that their primary responsibility lies only with the stockholders. They may think their goal is strictly to make profit, and ignore surrounding communities, ecological, and pollution problems. Or worse, they may believe that these have no bearing on economic and business considerations. A maladaptive marketing philosophy may lead to waste of resources, and the production of ineffective and even dangerous products. An adaptive marketing philosophy, on the other hand, is responsible to its stockholders and to society at large. Abnormalities in energy-related processes and internal matter could mean malfunctioning issues in producing and in assembling the final product, or inferior machinery. These may lead to dysfunctional, inferior, and even dangerous products, and to a substantial waste of resources, especially if marketing organizations do not use information effectively. As a consequence, a company may end up producing the

wrong products, or misallocate the company's resources, causing an unnecessary waste of scarce resources, and ultimately may result in the firm's failure. Failure of seriously approaching marketing as a social responsibility may prove to be detrimental to the company, and to society at large.

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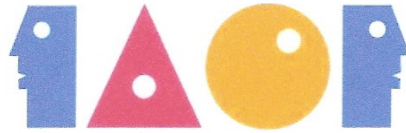
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THE AGGLOMERATION EFFECT OF UNPLANNED AND PLANNED
RETAIL AREA BASED ON CONSUMERS' POINTS OF VIEW:
EVIDENCE FROM TAICHUNG, TAIWAN

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Abstract

Based on the Western retailing development experience, the traditional unplanned retail area is threatened by the off-town planned retail area. The evidence also can be proposed in Taichung City, Taiwan, i.e. Taichung former CBD, located in town centre and nearby train station, is gradually replaced by the larger off-town department stores, located in the 7th land readjustment area. The main decline reasons of the unplanned retail area are coming from losing its retail agglomeration attractiveness and consumers' switching behavior. This study tries to investigate the differences of the retail agglomeration attractiveness between unplanned and planned retail areas based on the framework of attractiveness, satisfaction, and loyalty from consumers' points of view. Structural equation modeling is employed to exam their relationships and AMOS program is used to analyze mean and covariance structures. Based on a systematic sampling strategy, suggested by Sudman (1980), a face-to-face interview was carried out on the main streets of Taichung former CBD and Shin Kong Mitsukoshi department store in July and September 2009, and total 1,242 samples were successfully interviewed, 642 and 622 samples, respectively. The findings support that attractive indicators of the unplanned retail area more

likely to have directly positive relationships to loyalty, i.e. atmosphere and merchandise value indicators; attractive indicators of planned retail area seemly have ambiguous relationships between satisfaction and loyalty, e.g. atmosphere, retail tenant mix, and accessibility indicators have directly positive relationships to loyalty, parking indicator has a negative relationship to loyalty, and, finally, accessibility indicator has indirectly negative relationship to loyalty by satisfaction.

Keywords: retail agglomeration, unplanned retail area, planned retail area, structural equation modeling

Introduction

The evidence of retail impact varies between different types of retail development; in particular, the off-town new planned retail development vs. in-town retailers. According to reported relevant studies, such as Schiller (1986, 1987) and Fernie (1995, 1998), four waves of retailing decentralization were identified in UK. First two phases did not find sufficient evidence to prove serious impacts derived from off-town food and grocery retailers and retail warehouse, selling DIY, carpet, electrical and furniture goods, on in-town retailers. However, the third phase, the advent of off-town shopping centers in 1980s, was viewed as more of a direct threat to town centers (Howard, 1989, 1993; Howard and Davies, 1991, 1993). The evidence also can be proposed in Taichung City, Taiwan, i.e. Taichung former CBD, located in town centre and nearby train station, is gradually replaced by the larger off-town planned retailer, the Sing Kong Mitsukoshi department store, located in the 7thland readjustment area.

To avoid this direct threat, in-town retailers (or town centers) ought to realize that their continuing survival and success is largely bound up with their capacity to recognize and adapt to change (URBED, 1994). As relevant town centre management studies have shown, such as Warnaby, Bennison, and Davies (2005), Lowe (2005), and Scottish Government (2007), town centre health checks, and vitality and viability indicators are required. The principal indicators identified in the literature are: pedestrian flow; yield; rents; retailer demand; retailer representation; space in use/diversity fuse; vacancies; accessibility; environmental quality; and crime and safety.

Retail agglomerations (or retail clusters) are referred to sets of retailers (or shops) located in a nearby geographical area (Berman and Evans, 2001; Teller and Reutterer, 2008). In terms of consumers' perspective, agglomeration effects can be seen as the attractiveness of all retailer representations within one shopping area. Based on relevant studies, such as Burns and Warren (1995); Dennis (2005); Teller and Reutterer (2008); Teller (2008); and Teller and Elms (2010), retail agglomeration effects are treated as the process of a retail agglomeration attractiveness. This study aims to investigate the differences of the retail agglomeration attractiveness between unplanned and planned retail areas based on the framework of attractiveness, satisfaction, and loyalty from consumers' points of view.

Methods

Structural equation modeling is employed to exam the relationships among attractiveness, satisfaction, and loyalty. AMOS program is used to analyze their mean and covariance structures. Based on a systematic sampling strategy, suggested by Sudman (1980), a face-to-face interview was carried out on the main streets of Taichung former CBD and Shin Kong Mitsukoshi department store in July and September 2009, and total 1,242 samples were successfully interviewed, 642 and 622 samples, respectively.

Results

The empirical values of some statistical fit indices are compiled in Table 1. It is a well-known fact that the χ^2 -test depends on sample size (Blunch, 2008). Consider the sample size of this study, p-values not meeting the recommended value can be understood. Overall, a comparison with critical value as recommended in the relevant SEM literature point out that the empirical data fit the proposed baseline model to a satisfactory degree (e.g., Teller and Reutter, 2008; Teller, 2008; Teller and Elms, 2010).

Figure 1 and 2 provide graphical representations of the resulting path structure and corresponding parameter estimates for the Shin Kong Mitsukoshi department store (planned retail area) and the main streets of Taichung former CBD (unplanned retail area), models respectively. In both illustrations, the left side depicts the nine (exogenous) factors (ξ_1 - ξ_9). For the sake of clarity, the correlations among the single factors have been omitted. The right side includes the

two (endogenous) factors (η_1, η_2). Arrows connecting exogenous with endogenous factors symbolizes the proposed effects directions. Effects or (standardized) coefficients with significant p-values ($p < 0.05$) are highlighted by black thick lines, which also indicate whether the proposed hypotheses are being accepted.

Table 1. Global fit measures

Index	Empirical value	Recommended values
<i>Absolute fit measures</i>		
χ^2 (df, p)	1290.0898(490;0.000)	$p > 0.05^*$
GFI(Goodness of Fit Index)	0.992	> 0.90
AGFI(Adjusted Goodness of Fit Index)	0.888	> 0.90
RMSEA(Root Mean Square Error of Approximation)	0.036	< 0.05
<i>Incremental fit measures</i>		
IFI(Incremental Fit Index)	0.926	> 0.90
TLI(Tucker-Lewis-Index)	0.900	> 0.90
CFI(Comparative Fit Index)	0.925	> 0.90
<i>Parsimony fit measures</i>		
Normed χ^2 (CMIN/df)	2.633	1~3
PNFI(Parsimony-Adjusted NFI)	0.668	> 0.50
PCFI(Parsimony Goodness of Fit Index)	0.697	> 0.50

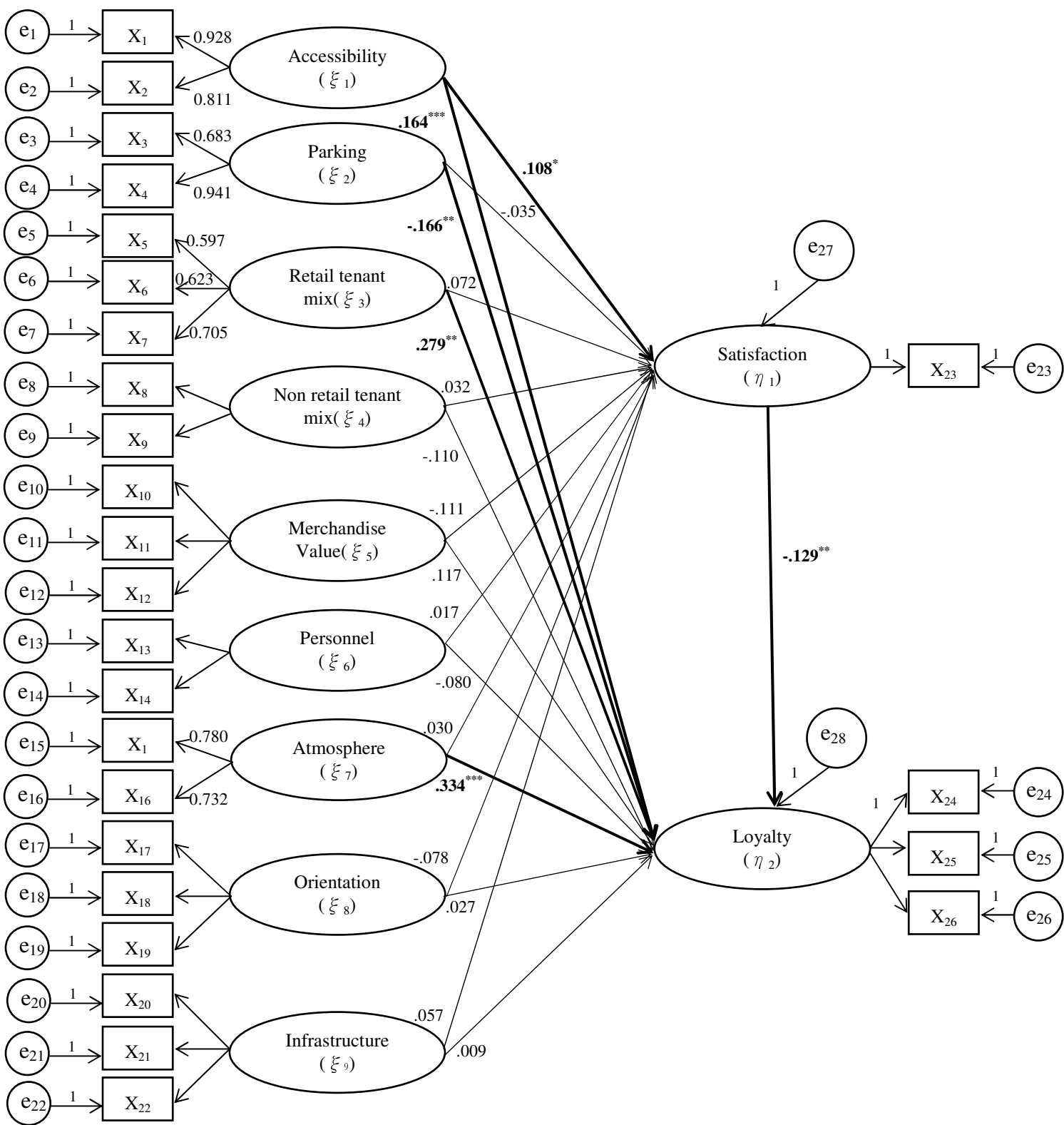
*Not relevant since χ^2 -statistics are sensitive against large sample sizes

Following the path structure depicted in Figure 1 and 2, ‘Accessibility’ (ξ_1) influences the ‘satisfaction’ (η_1) and ‘loyalty’ (η_2) in the Shin Kong Mitsukoshi department store. But only

influences the 'satisfaction' (η_1) in the main streets of Taichung former CBD. Interestingly, 'Parking' (ξ_2) exerts negative and significant effect on the 'loyalty' (η_2) in the Shin Kong Mitsukoshi department store, but exerts no significant effect in the other. There is a medium effect of the 'Retail tenant mix' (ξ_3) on 'loyalty' (η_2) can be identified in the Shin Kong Mitsukoshi department store, whereas this factor does not play any role in the main streets of Taichung former CBD. 'Merchandise Value' (ξ_5) can be regarded as influential to 'loyalty' (η_2). More interestingly, the 'Atmosphere' (ξ_7) is the most influencing variable on the 'loyalty' (η_2) of both agglomerations. In particular, the 'satisfaction' (η_1) only plays a negative and significant role in the Shin Kong Mitsukoshi department store.

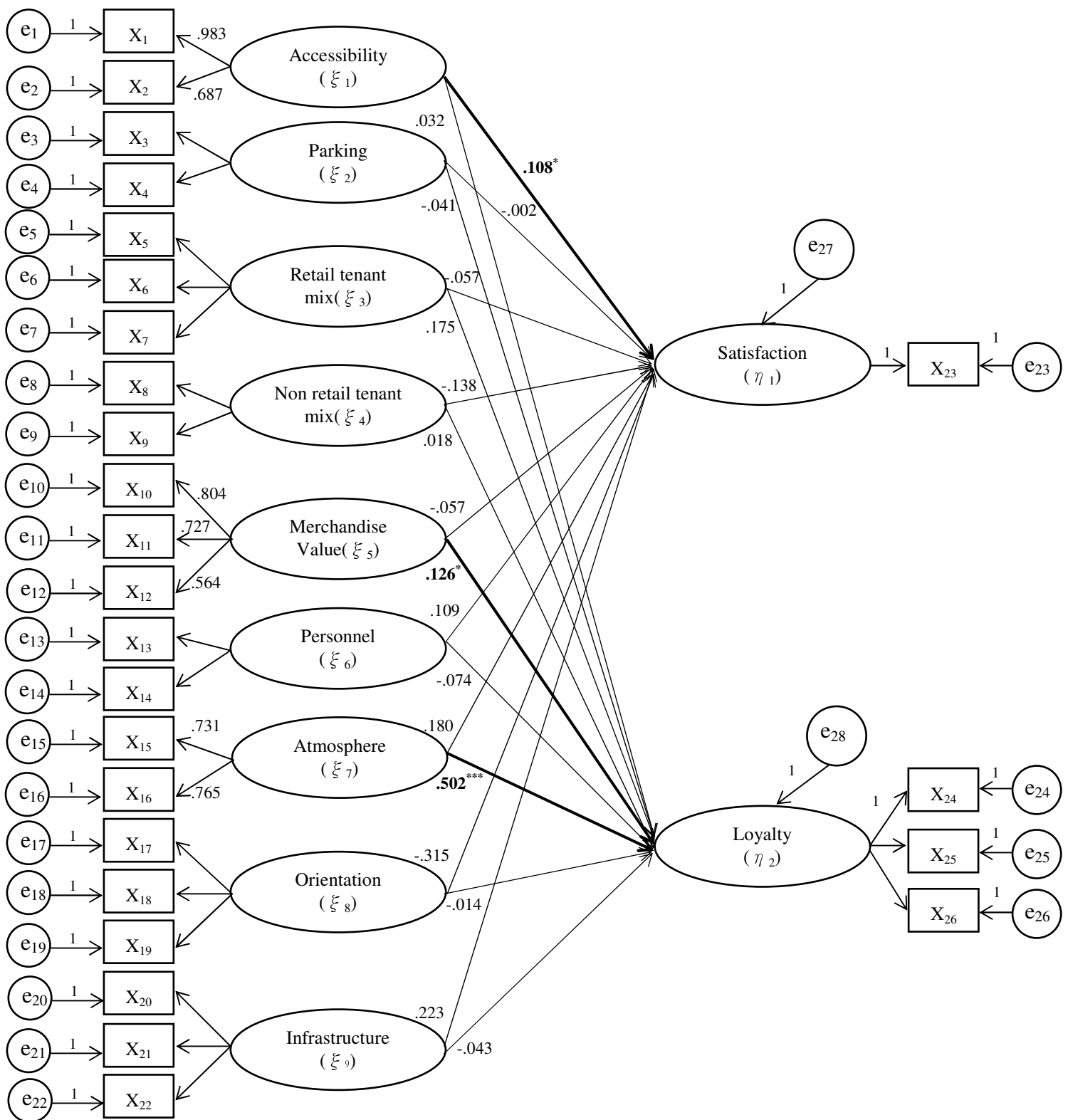
Discussion and Conclusions

The study findings support some relevant research results, such as Teller and Reutter (2008); Teller (2008); Teller and Elms (2010). Attractive indicators of the unplanned retail area more likely to have directly positive relationships to loyalty, i.e. atmosphere and merchandise value indicators; attractive indicators of planned retail area seemly have ambiguous relationships between satisfaction and loyalty, e.g. atmosphere, retail tenant mix, and accessibility indicators have directly positive relationships to loyalty, parking indicator has a negative relationship to loyalty, and, finally, accessibility indicator has indirectly negative relationship to loyalty by satisfaction.



Notes:
 *p<0.05; **p<0.01; ***p<0.000.

Figure 1. Effects (standardized regression weights) within the Shin Kong Mitsukoshi department store model



Notes:
 *p<0.05; **p<0.01; ***p<0.000.

Figure 2. Effects (standardized regression weights) within the main streets of Taichung former CBD model

Accessibility(ξ_1)

X₁: You can get to...easily.

X₂: You can get to...quickly.

Parking(ξ_2)

X₃: There are always enough free parking lots.

X₄: There are sufficient different parking possibilities.

Retail tenant mix(ξ_3)

X₅: ...has a large variety of retail stores.

X₆: ...has an attractive variety of retail stores.

X₇: ...have numerous well-known retail stores.

Non retail tenant mix(ξ_4)

X₈: You can find lots of gastronomy at....

X₉: ...offers a large variety of entertainment.

Merchandise Value(ξ_5)

X₁₀: Prices for offered goods are low.

X₁₁: you can find lots of bargains at....

X₁₂: Price/performance ratio is good at....

Personnel(ξ_6)

X₁₃: Personnel are friendly in....

X₁₄: Personnel are competent in....

Atmosphere(ξ_7)

X₁₅: The atmosphere at...is pleasant.

X₁₆: There is a good mood at....

Orientation(ξ_8)

X₁₇: You can move around safely and quickly in....

X₁₈: You can easily orientate themselves within....

X₁₉: Stores are arranged clearly in the....

Infrastructure(ξ_9)

X₂₀: There are enough toilets in....

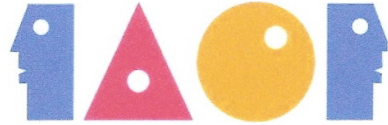
X₂₁: ...have enough cash dispensers....

X₂₂: ...offers enough recreational areas.

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THE INFLUENCE OF ANIMATED SPOKES-CHARACTERS ON CUSTOMER ORIENTATION

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Abstract

In today's keenly competitive markets, advertising has become an indispensable and important tool in the marketing activities and a spokesperson is even the soul of it. An appropriate spokesperson could facilitate with his or her popularity and expertise to quickly attract the attention from consumers and create sales success for business or brand. However, a real celebrity endorsement may bring about unexpected risks that in recent years, many businesses have turned to animated spokes-characters for advertising promotions. Through case interviews, this study explores consumers' preferences and views of animated spokes-characters employed by businesses. The results found that based on the preferences of target customer segment, choosing or self-creating a appropriate animated spokes-characters by businesses could not only create the differentiation of similar products but also enhance consumers' sense of recognition and purchase intention that will in turn bring diversified business opportunities.

Keywords: brand marketing, advertisement spokesperson, animated spokes-characters, advertisement effectiveness, purchase intention

Background

As the various modern print, electronic media and Internet are vigorously developing, the advertisement has been widely used as a tool in marketing activities. An impressive advertisement could not only narrow the distance between products and consumers but also enhance awareness

and association of product or brand. So Abernety and Fank (1996) pointed out that in addition to focusing on corporate image and products, a good advertising strategy should be fascinating in passing on the message. In order to communicate correctly the advertising messages, many companies have developed marketing strategy of advertisement spokesperson with a hope that the spokesperson's charm and positive image could resonate with consumers to affect their attitude toward the products and brand and thus stimulate consumers' purchase intention. Baker and Churchill (1977) argued that the advertisers did extend consumers' love for celebrities to their products or brand through the endorsement by the celebrities, resulting in emotional recognition and positive attitude, and thus led to the desire to buy the products. But Brian and Shimp (1998) stressed that when the spokesperson's comments or behaviors were controversial, the products or brand he or she endorsed would be encumbered. Therefore, after weighing the effects, many companies have begun to adopt animated spokes-characters to speak for their products or brands.

Callcott and Lee (1995) argued that the animated spokes-characters mainly used different type of animals, human beings, virtual patters and objects to speak for the products in different media. After being given anthropomorphic personality and characteristics, such virtual patterns could be used in product recognition or in commercial promotion. Callcott and Phillips (1996) also agreed that because the animated spokes-characters were created for specific commercial uses, in addition to representing products or corporate image, it was animated with historical background and the significance of brand at the beginning of design to convey the personality and culture of brand. So the animated spokes-characters should be considered as the part of intangible assets. Phillips and Gyoerick (1999) found that many high-involvement products had begun to use animated spokes-characters to speak for them and convey the characteristics of products and corporate culture.

In recent years, more and more businesses have used virtual characters primed with cartoon characters and toy dolls as corporate advertising spokesperson to speak for them through different marketing combinations in their behalf. That did not only grasp the consumers' mentality of love for animated spoke-characters but also created record of sales for each business. Such "Kawaii" advertising effects pulled closer the distance between consumers and the products, increased the sales and created business opportunities for the peripheral products derived from the animated spokes-characters. Because the animated spokes-characters have become an inevitable trend of commercial development, the purpose of the study is trying to understand the effects of animated spokes-characters on consumers.

Methodology

This study aims to explore the effects of animated spokes-characters on the different customer groups, the correlations with consumer's preferences and the relationship between different type of animated spokes-characters and attitude toward the brand and purchase intention to find out the reasons that may affect the consumer's preferences. It will help the corporate in creating product differentials and enhancing corporate profitability. Therefore, during the exploration of consumer's cognition and behavioral intention, we adopted one-to-one "non-structural interviews" to interview with general consumers that enriched the material of cases and made them more real. Besides, because the consumers' love and acceptance of the animated spokes-characters are the keys of success of advocacy by animated spokes-characters, the study interviewed primarily with consumers. Through the interviews with 50 consumers of different genders, occupations, ages, marital status, children conditions and consumption habits to understand the views and suggestions from different type of consumers on the animated spokes-characters. After interviews, the information was reorganized and analyzed before it was inducted

and inferred into constructive results.

Total 50 customers were interviewed. Using the frequency allocation, we calculated the number of and percentage of customers in genders, occupations, ages, marital status, children conditions and consumption habits to understand the respondents' distribution. After statistical data synthesizing, we used Chi-square test to examine if there is any difference in using different animated spokes-characters and effects among respondents who have different background.

Background Variables and Research Variables

The background variables in this study are “gender”, “age”, “marital status” and “children conditions” whereas the research variables are divided into “ effects of animated spokes-characters on products and corporate”, “effects of animated spokes-characters on ‘expertise’ or ‘high-involvement’ products” and “consideration for using animated spokes-characters”. The contents are sub-divided as Table 1 shows.

The Synthesizing of Current Situation of Research Variables

After computing basic information of 50 effective interviewed samples with frequency allocation, we used Chi-square test to examine if there is any difference in using different animated spokes-characters and effects among respondents who have different background. If the Chi-square value reaches the level of significance, use Haberman adjusted standardized residuals to perform post hoc comparisons. If the absolute value of the adjusted residuals is greater than 1.96, it means the value has fallen in 5% in the extreme of standardized normal distribution, that is, reaching the level of $\alpha = .05$. Before analysis, we combined groups of age by combining “21-30 years old” and “31-40 years old” into “the young” and “41-50 years old” and “51-60 years old” into “the senior”. The analytical results are shown as Table 2:

Table 1. The Contents of Research Variables

Research Variables	Contents
Effects of Animated Spokes-Characters on Products and Corporate	Does the love for animated spokes-characters trigger purchase intention?
	Does the image of animated spokes-characters affect the views on products or corporate?
	Do the peripheral products the corporate develop through animated spokes-characters attract purchase ?
Effect of Animated Spokes-Characters on “Professional” or “High-Involvement” Products	Does the application of animated spokes-characters increase recognition, trust and purchase intention for products?
	When there are two professional or high-involvement products that have extremely similar performance/cost values (CP) quality, will you use the item the animated spokes-characters speak for?
Considerations for the Use of Animated Spokes-Characters	If you are corporate owner, will you use which kind of animated spokes-character?

Table 2 The Synthesizing of Current Situations of Research Variables

Research Variables	Background of Variables			
	Gender	Age	Marital Status	Children Condition
Effects of Animated Spokes-Characters on Products and Corporate				
The love for animated spokes-characters will trigger purchase intention.		Significant	Significant	Significant
The image of animated spokes-characters affect the views on products or corporate.	Significant			
The peripheral products the corporate develop through animated spokes-characters will attract purchase.		Significant	Significant	Significant
Effect of Animated Spokes-Characters on “Professional” or “High-Involvement” Products				
The application of animated spokes-characters increase recognition, trust and purchase intention for products				Marginally Significant
When there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity , will use the item the animated spokes-characters speak for		Significant	Significant	Significant
Considerations for the Use of Animated Spokes-Characters				
If you are corporate owner, will you use which kind of animated spokes-character?		Marginally Significant	Marginally Significant	

From Table 2, we could learn:

- a. The difference of different gender of respondents only existed in the ratios of “the image of animated spokes-characters affect the views on products or corporate” ($p < .05$). From the adjusted standardized residual values, we could learn that the ratio of female consumers thought to be affected by it was higher than the male (88% > 64%), indicating that the female consumers’ views on the products and corporate are more prone to be affected by animated spokes-

characters.

b. The difference between the different age of respondents existed in the ratios of “The love for animated spokes-characters will trigger purchase intention”, “The peripheral products the corporate develop through animated spokes-characters will attract purchase” and “When there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity, will you use the item the animated spokes-characters speak for?” ($P < .05$). From the adjusted standardized residual values, we could learn that the ratio of the young group was higher than the senior group ($78.57\% > 22.73\%$) in “The love for animated spokes-characters trigger purchase intention”, indicating for the ratios by age, more young people, comparing to the senior people, would buy the products because of their love for the animated spokes-characters. For “the peripheral products the corporate develop through animated spokes-characters will attract purchase”, the ratio of the young group that the animated spokes-characters might trigger their purchase intention was higher than the senior group ($78.57\% > 27.27\%$); for “When there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity , will use the item the animated spokes-characters speak for” , the ratio of the young group who thought they would was higher than the senior ($89.29\% > 59.09\%$); there was no difference in the ratios of “If you are corporate owner, will you use which kind of animated spokes-character?” ($p > .05$), however, it had marginal

significance. The study found that the ratio of the young was higher than the senior in the adoption of “self-designed” animated spokes-characters (82.14% >59.09%) and the ratio of the young group was also higher than the senior in the adoption of “authorized portrait” animated spokes-characters (40.91% >17.86%)

c. The difference between different marital statuses among respondents existed in the ratios of “The love for animated spokes-characters will trigger purchase intention”, “The peripheral products the corporate develop through animated spokes-characters will attract purchase” and “When there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity, will you use the item the animated spokes-characters speak for?” ($p < .05$). From the adjusted standardized residual values, we could learn that the ratio of the married was lower (41.18% < 81.25%) than the unmarried in “The love for animated spokes-characters trigger purchase intention” ; for “The peripheral products the corporate develop through animated spokes-characters will attract purchase”, the ratio of the married was lower (41.18% < 87.50%) than the unmarried; for “When there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity , will you use the item the animated spokes-characters speak for?”, the ratio of the married who thought they would was lower than the unmarried (67.65% < 93.75%), indicating that less married people, comparing with the unmarried people, would adopt animated spokes-

characters when there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity . There was no difference ($p > .05$) in the ratios in the item “if you are corporate owner, will you use which kind of animated spokes-character?”, however, there was marginal significance. The study also found that the ratios of both the married and the unmarried who chose “self-designed” were higher than the ratios of those who choosing “authorized portrait”.

d. The difference between different children conditions of respondents existed in the ratios of “the love for animated spokes-characters will trigger purchase intention”, “the peripheral products the corporate develop through animated spokes-characters will attract purchase” and “when there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity , will you use the item the animated spokes-characters speak for?” ($p < .05$). From the adjusted standardized residual values, we could learn that the ratio of those who had children was lower ($37.50\% < 83.33\%$) than those who had no child in “the love for animated spokes-characters trigger purchase intention”; for “the peripheral products the corporate develop through animated spokes-characters will attract purchase”, the ratio of those who had children was also lower ($40.63\% < 83.33\%$) than those who had no child; for “when there are two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity , will you use the item the animated spokes-

characters speak for?”, the ratio of those who said they would among who had children was again lower (65.63% < 94.44%) than who had no child; for “the application of animated spokes-characters for professional and high-involvement products increase recognition, trust and purchase intention for products”, there was no difference in ratios ($p > .05$), however, there was marginal significance. The study also found that the ratios in both group of having child or having no child who thought the application of animated spokes-characters for professional and high-involvement products would increase recognition, trust and purchase intention for products were higher than who thought it would not.

Results and Discussion

- a. When construct the image of animated spokes-characters, we should start form the angle of the female:

The female usually pay more attention on the image of animated spokes-characters and the image would affect the female’s views on the products or corporate. Most of the female consumers are usually responsible for the allocations of family income and expenditures and purchase that the image of animated spokes-characters should meet the female’s recognition to gain higher sense of recognition and purchase intention.

- b. The animated spokes-characters have better marketing effects on the those who are unmarried, no child and the young consumers:

Through the analyses of the results of interview, the consumers who were unmarried, no child and young (21-40 years old) were prone to transfer the love for the animated spokes-characters to the intention for purchasing advocated products or peripheral products. And when there were two professional or high-involvement products that have extremely similar performance/cost values, quality and quantity, the consumers would also be inclined to buy the products the animated spokes-characters speak for. The unmarried, no child and young group is primarily composed of students and workers and their love for the animated spokes-characters usually comes from their innocent childhood. In the busy and stressful real life, the lovely shape of animated spokes-characters and anthropomorphic behaviors could bring a lot of joy in life. Quite a few researches pointed out that the consumers did release pressure through consumption. In addition to actual demand of the products, the unmarried, no child and young consumers could also obtain a little bit of satisfaction and joy by love, collecting animated spokes-characters and purchasing behaviors.

Conclusions

Based on the study of the literature, the analyses of results in the study, we could induct following conclusions:

- a. There were differences in the preferences and views on animated spokes-characters among consumers who had different gender, age, marital status and children conditions.

Therefore, before entering into market, corporate needs to conduct market segmentation and based on the preferences of target customer groups to the animated spokes-characters. Choose or create an appropriate animated spokes-character for the products to resonate with consumers and enhance their purchase intention.

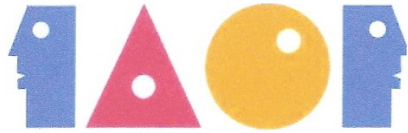
b. The marketing effects of using animated spokes-characters for high-involvement professional products of same type, CP values, quality and quantity would be better than those of not using. The differentiation of unique style of products created by animated spokes-characters would enhance the consumers' recognition and purchase intention.

c. Buying the peripheral products the animated spokes-characters speak for revealed that in addition to providing consumers' recognition, the charm of animated spokes-characters could also be expanded as subject of the brand or product, changing from the role of advocacy for specific commodity or corporate to be independent commodity or brand to create diversified business opportunities.

d. It is appropriate for the products that are short life cycle or easy to imitate to use authorized cartoon characters as spokespersons, taking advantaging of popularity and appeal of cartoon characters to create the differentiation between similar products and enhance consumers' loyalty.

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DATA MINING MODELS FOR DIAGNOSING ACUTE RENAL FAILURE

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Abstract

According to a report of the Taiwan National Kidney Foundation, there were about 42,000 end stage renal disease patients in 2010 in Taiwan. In intensive care units (ICUs), acute renal failure (ARF) as a complication of non-renal organ system failure is associated with mortality rates of 50% to 70%. For this study, we collected data for 243 patients in ICUs. We used two popular data mining algorithms, an artificial neural network and a support vector machine, to predict patient deaths and their need for dialysis. The results showed that an artificial neural network outperformed a support vector machine. For predicting patient deaths, the artificial neural network achieved a classification accuracy of 0.8268 with a sensitivity of 0.8325 and a specificity of 0.8435. For predicting patients' need for dialysis, the artificial neural network achieved a classification accuracy of 0.8229 with a sensitivity of 0.8310 and a specificity of 0.8433. These results suggest that an artificial neural network can provide a good model for kidney disease prognosis.

Keywords: Acute Renal Failure (ARF), Support vector machines (SVM), Artificial Neural Networks (ANNs), k-Fold cross-validation,

Introduction

Kidney diseases are currently one of the major causes of morbidity and mortality in Taiwan. According to statistics from the National Kidney Foundation, there were about 42,000 end stage renal disease (ESRD) patients in Taiwan in 2010. Kidney disease is one of the 10 major causes of death in Taiwan (Table 1), and acute renal failure is a major cause of concern. At a rate of nearly 4 of 100 diseases diagnosed, acute renal failure is the most frequently diagnosed disease in Taiwan. In Taiwan, of 4,105 deaths due to nephritis, nephritic syndrome, and nephrosis-related disease in 2010, 2,088 were among males and 2,017 were among females (Department of Health, 2011). Acute renal failure (ARF) in the intensive care unit (ICU) is associated with mortalities of 45% to 70%.

Table 1. The kidney diseases is one of ten major causes of the death in Taiwan

	Kidney Trouble									
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Rank	7	8	7	7	8	7	8	10	10	10

Data authority: Department of Health, Executive Yuan, Taiwan. (2011)

The purpose of this study was to construct prognosis models for dialysis-related conditions in the surgical ICU. The results of this study could provide a prognosis model of use

for clinical treatments (Ravindra et al., 2002). The present study was motivated by an increased emphasis on acute renal failure-related research, for which new and innovative methods for early detection and treatment have been developed. These have helped to decrease the death rates related to kidney diseases.

Many investigators have relied on various traditional statistical methods for disease prediction. Linear discriminate analysis (LDA), and Bayesian and logistic regression were the three most common statistical techniques used for developing disease prediction models (Ksantini et al., 2010; Dixon & Brereton, 2009; Worth & Cronin, 2003; Pendharkar et al., 1999). One major advantage over other classification techniques is that the resulting models can be easily interpreted. This has important implications for management and interpretation and can aid in making appropriate therapeutic decisions.

Recently, data mining (DM) techniques, sometimes referred to as knowledge discovery methods, have arisen as a systematic approach to finding hidden patterns, trends, and relationships in data (Osei-Bryson, 2012; Pendharkar et al., 1999). There are several approaches to data mining that can be broadly classified into two categories: methodologies and technologies. Methodologies include cluster analysis, linkage analysis, visualization, and categorization analysis. Technologies include connectionist models/neural networks, decision trees, genetic algorithms, fuzzy logic, statistical approaches, and time series analysis (Pass,

1997). The use of data mining in medicine is a rapidly growing field that aims to discover some structure in large sets of clinically heterogeneous data (Osei-Bryson, 2012; Cios & Moore, 2002). However, statistical analysis experts are limited in their knowledge of medically relevant concerns and may overlook important details, while automated discovery tools can analyze raw data and extract high level information for decision makers (McDonald et al., 1998).

A more recently developed machine learning technique, a support vector machine (SVM), has been applied to problems in an attempt to provide a model with better explanatory power. Huang et al. (2007) used three strategies to construct a hybrid SVM-based credit scoring model to evaluate an applicant's credit score from the applicant's input characteristics. Luo & Cheng (2009) compared clustering-launched classification (CLC) and a support vector machine (SVM) for predicting credit scores. In this paper, we compare the performance of a support vector machine (SVM) and an artificial neural network (ANN) for mining data related to acute renal failure.

We used the data from a medical center located in northern Taiwan in their Diseases Databases for the years 1995-2010, which is the most comprehensive source of information on acute renal failure incidence in Taiwan. We used two different classification models, an SVM and an ANN, along with a 10-fold cross-validation technique to compare the accuracy of these classification models. In addition, we demonstrate how the SVM and another data mining model

can be used in a policy analysis for acute renal failure management in a health-insurance domain. There are two contributions from the results of our study. First, we establish a new and relatively unexplored approach, SVM, for classification analysis and a non-parametric technique (ANN's). Second, we illustrate the utility of data mining in learning algorithms relevant to acute renal failure.

The remainder of this paper is organized as follows: Section 2 summarizes the recent literature on data mining; Section 3 provides a brief description of SVM's and ANN's for classification analysis; Section 4 provides a description of the data used for this study and the results of our experiments; and Section 5 concludes the paper with a summary of our findings and directions for future research.

Methods

Support Vector Machines (SVM)

The support vector machine (SVM) concept was developed by Vapnik (1995). The SVM is emerging as a powerful machine learning technique for data classification and regression. SVM has already been successfully used for a wide variety of problems, such as pattern recognition, bio-informatics, and others (Chen, Cheng, & Wu, 2012; Rüping, 2000). An SVM can produce a regression model or a classification function based on a set of training data.

The main idea behind an SVM derives from its binary classification algorithm; that is, to find a hyper plane as a segmentation of two classes to minimize classification errors. The maximum margin hyper plane gives the maximum separation between decision classes. The training data that are closest to the maximum margin hyper plane are called the support vectors. In addition, SVM can solve problems with linear or non-linear segmentations (Stoean et al., 2011; Luo & Cheng, 2009; Rüping, 2000). A simple description of the SVM algorithm is the following.

Given a training set with input vectors and target labels,

$(x_i, y_i), i = 1 \dots l, x \in R^n, y \in \{+1, -1\}$, the following conditions must be satisfied:

$$x_i + b \geq +1 \text{ for } y_i = +1$$

$$x_i + b \leq -1 \text{ for } y_i = -1 \quad \text{Eq. 1}$$

This is equivalent to

$$y_i(w_i \times w + b) - 1 \geq 0 \quad \forall_i \quad \text{Eq. 2}$$

This technique looks for a hyper plane, $w \times x_i + b = 0$, to separate the data into classes of +1 and -1 with a maximal margin in the feature space having a margin width between both hyper planes

equal to $\frac{2}{\|w\|^2}$. The maximization of the margin is equivalent to minimizing the norm of w .

In primal weight space, the classifier uses the decision function from Eq. (3). Thus, as shown by

Cristianini & Taylor (2000), the SVM was trained to solve the following optimization problem:

$$f(x) = \text{sign}(w \times x) + b \quad \text{Eq. 3}$$

$$\text{Minimize: } \frac{1}{2} w^T \times w + C \sum_{i=1}^N \xi_i \quad \text{Eq. 4}$$

$$\text{subject to } y_i (w_i \times w + b) \geq 1 - \xi_i \text{ and } \xi_i \geq 0 \text{ for } i = 1, K, n, \quad \text{Eq. 5}$$

where C is a regularization parameter that imposes a trade-off between training error and generalization and ξ_i are slack variables. These restrictions are imposed to ensure that no training pattern should be within the margins. However, these are relaxed by the slack variables to avoid noisy data.

The classifier represented in Eq. (3) is still restricted by the fact that it performs only a linear separation of the data. This can be overcome by mapping the input examples to a high-dimensional space, where they can be efficiently separated by a linear SVM. This mapping is performed using Kernel functions that allow access to spaces of higher dimensions without explicitly knowing the mapping function, which is usually quite complex.

The Kernel functions compute dot products between any pair of patterns in this new space. Thus, the only modification necessary to deal with a non-linearity is to substitute any dot

product among patterns generated by the Kernel products. In this study of patients' data, we commonly used radial basis functions (RBF), a type of Kernel function, illustrated in Eq. (6).

$$K(x_i, x_j) = \exp(-\sigma \|x_i - x_j\|^2) \quad \text{Eq. 6}$$

It should be noted that SVM's were originally proposed to solve binary classification problems. In this study, using the methods of Luo & Cheng (2009), we evaluated the SVM model to compare various classification techniques to predict patient deaths and their need for dialysis.

Artificial Neural Networks (ANN's)

ANN's were invented to mimic some of the phenomenon observed in biology. The biological metaphor for ANN's is the human brain. An ANN consists of different sets of neurons or nodes and the connections between one set of neurons to another. Each connection between two nodes in different sets is assigned a weight that shows the strength of the connection. Connections with positive weights are called excitatory connections and connections with negative weights are called inhibitory connections (Jain & Dubes, 1988; Rumelhart et al., 1986; Weiss & Kapouleas, 1989).

The extraction of knowledge from ANN's remains an active area of research (Setiono, 2003). Currently, there are two main approaches (Tickle, et al. 1998): decomposition and pedagogical techniques.

Formally defined, ANN's are analytic techniques modeled after the learning processes of the cognitive system and the neurological functions of the brain. These are capable of predicting new observations from other observations after executing a process of so-called learning from existing data (Haykin, 1998). Delen, Walker, & Kadam (2005) used a popular ANN architecture called a multi-layer perceptron (MLP) with back-propagation (a supervised learning algorithm). The MLP is a powerful function approximator for prediction and classification problems. In fact, Hornik et al. (1990) empirically showed that, given the right size and structure, an MLP was capable of learning arbitrarily complex nonlinear functions to within arbitrary accuracy levels.

Fig. 1 shows a graphical representation of MLP architecture (Delen et al, 2005).

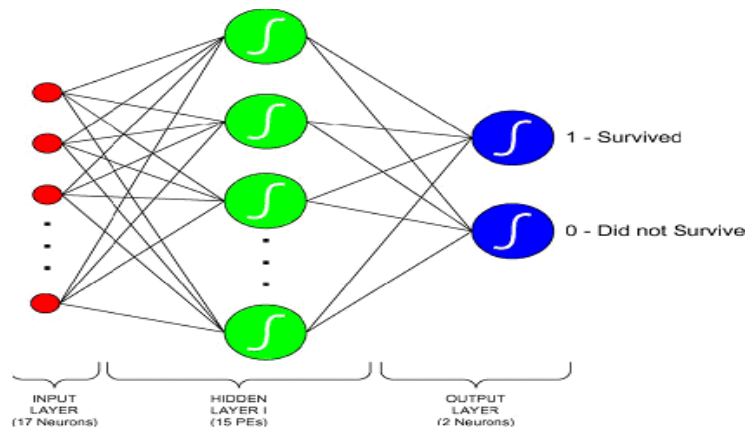


Figure 1 Graphical representation of our MLP ANN model (Delen et al, 2005).

*Measures for Evaluating Performance
Accuracy, sensitivity, and specificity*

In this study, we used three performance measures: accuracy (Eq. 7), sensitivity (Eq. 8), and specificity (Eq. 9) (Delen et al, 2005):

$$accuracy = \frac{TP + TN}{TP + TN + FP + FN} \quad \text{Eq. 7}$$

$$sensitivity = \frac{TP}{TP + FN} \quad \text{Eq. 8}$$

$$specificity = \frac{TN}{TN + FP} \quad \text{Eq. 9}$$

where TP denotes true positives, TN denotes true negatives, FP denotes false positives, and FN denotes false negatives.

k-Fold cross-validation

Delen et al. (2005) pointed out that when minimizing the bias associated with random sampling of training and holdout data samples to compare the predictive accuracy of two or more methods, investigators tend to use k-fold cross-validation. In k-fold cross-validation, also called rotation estimation, a complete dataset (D) is randomly split into k mutually exclusive subsets of approximately equal size (folds: D1, D2, . . . , Dk).

Empirical studies have shown that stratified cross-validation tends to generate comparison results with lower bias and lower variance as compared to regular k-fold cross-validation (Kohavi, 1995). Furthermore, to estimate the performance of classifiers, a stratified

10-fold cross-validation approach is used. Empirical studies have shown that 10 appears to be the optimal number of folds (Breiman, et al., 1984; Kohavi, 1995).

In this study, to estimate the performance of classifiers, a stratified 10-fold cross-validation approach was used. In 10-fold cross-validation, the entire dataset is divided into 10 mutually exclusive subsets with approximately the same class distribution as the original dataset. Each fold is used once to test the performance of the classifier that is generated from the combined data of the remaining nine folds, which leads to 10 independent performance estimates (See Fig. 2).

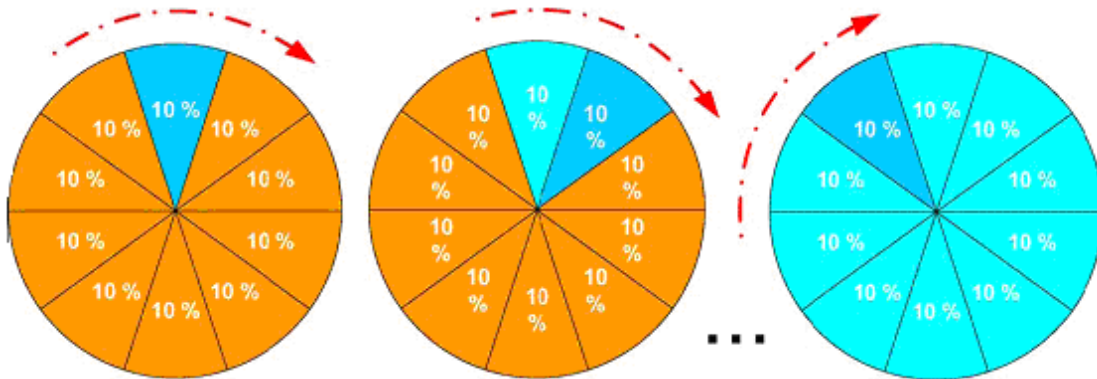


Figure 2. Graphical representation of the ten-fold cross-validation procedure (Delen et al., 2005).

Analytic Approach

Data Analysis

We used data found in one medical center's Diseases Databases. The raw data set was comprised of 479 patients, from which we collected data for 243. There were 62 variables in

each file, and each record in the file was related to a specific incidence of acute renal failure (Table 2). The descriptions in the files in the data set included: Death, Dialysis, Sex, Age, BH, BW, BSA, ..., and others; these were collected during physical examinations, and each record in this data was related to a specific incidence of a condition.

Table 2. The description of the fields in the data set

	Variable	Variable type
Dependent (y)	1. Death 2. Dialysis	Qualitative variable
Independent t (x)	Sex	Qualitative variable
	Age, BH, BW, BSA	Quantitative variable
	DM, Hypertension, Proven cirrhosis, Severe COPD, Immune Compromised	Qualitative variable
	CNS, Lung, Heart, Liver, kidney, GI, BM, Sepsis	Qualitative variable
	Temperature, Heart Rate, RR, DBP, SBP, MAP, Urine Output	Quantitative variable
	azotemia, Fluid overload, electrolyte imbalance, Acid-base imbalance, Rhabdomyolysis, anuria, shock	Qualitative variable
	Cre, CCR, BUN, Na+, K+, Lactate, WBC, Hb, Hct, Platelet, GOT, Bil, Sugar, Albumin, PH	Quantitative variable
	CVP, P_aO_2 / F_iO_2 , U/O:8hr, U/O:2hr	Quantitative variable
	elective, emergency, CPR	Qualitative variable
Diuretics, Ventilator, NPO, IE, intra-OP whole blood, intra-OP-PRBC, TPN, IABP, ECMO	Qualitative variable	

Understanding the data and the data preparation stages are among the most important steps involved in data mining applications. The vast majority of time spent on developing data mining applications is taken up in these earliest stages (Cios & Moore, 2002). The raw data were uploaded into an Excel database, SPSS statistical analysis tool, Statistical data miner, and Clementine data mining toolkit. These software packages were used to explore and manipulate the data. The following section describes the surface complexities and structure of the data.

After an initial screening, 243 useable records remained. The range of patients' ages was 18-90 yr., and their mean age was 64 ± 12.44 yr. There were 147 males and 96 females. Males' average age was 64.44 ± 13.39 yr. and females' average age was 63.69 ± 8.49 yr. The means for the variables body height (BH) and body weight (BW) were 158.93 ± 7.15 cm and 58.93 ± 10.74 kg, respectively.

Data Processing

In this study, we used an SVM and an ANN to train two real world data sets. The SVM tool we used was MySVM developed by Rüping (2000). Other tools are included in SPSS for Windows 12.0 and Clementine 7.2. All of our experimental results were obtained using an AMD Turion64 MK38 2.2GHz PC and Windows XP professional operating system. We performed experiments using published template datasets and compared the results of an ANN and MySVM. Because we did not know which parameters or kernels were appropriate for these

samples, several parameters and randomly selected kernels were tried, respectively, for the ANN and MySVM to find the best performance for prediction.

Experimental Results and Discussion

We performed experiments using published template datasets and compared the results of an SVM and an ANN. Because we did not know which parameters or kernels were appropriate for these samples, several parameters and randomly selected kernels were tried, respectively, for an SVM and an ANN to find the best performance for prediction. Comparisons were based on 10-fold cross validation. The experimental results shown in Tables 3 and 4 summarize the accuracy, sensitivity, and specificity of these approaches.

We evaluated the models based on the accuracy measures discussed above for classification (1) accuracy, (2) sensitivity, and (3) specificity. The results were derived using 10 fold cross-validation for each model, and were based on the average results obtained from the test dataset (10th fold) for each fold.

Table 3 shows the comparisons of accuracy, sensitivity, and specificity for the SVM and the ANN for the death dataset. We found that the SVM achieved a classification accuracy of 0.7772 with a sensitivity of 0.7794 and a specificity of 0.7929. The ANN model achieved a classification accuracy of 0.8626 with a sensitivity of 0.8325 and a specificity of 0.8435. These results showed that the ANN outperformed the SVM.

Table 3. Results of predicted the patients' death for 10-fold cross-validation for all folds and all model type

Fold No.	SVM			ANNs		
	Accuracy	Sensitivity	Specificity	Accuracy	Sensitivity	Specificity
1	0.7601	0.7710	0.7742	0.8210	0.8452	0.8342
2	0.7736	0.7807	0.7906	0.8320	0.8411	0.8560
3	0.7870	0.7959	0.8015	0.8270	0.8390	0.8515
4	0.7786	0.7683	0.8031	0.8313	0.8420	0.8431
5	0.7631	0.7862	0.7929	0.8131	0.8262	0.8392
6	0.7637	0.7964	0.7845	0.8373	0.8364	0.8512
7	0.7730	0.7901	0.7943	0.8130	0.8310	0.8343
8	0.7795	0.7618	0.7816	0.8195	0.8118	0.8417
9	0.8050	0.7626	0.8016	0.8450	0.8360	0.8416
10	0.7888	0.7806	0.8026	0.8288	0.8160	0.8420
Mean	0.7772	0.7794	0.7927	0.8268	0.8325	0.8435
St. Dev.	0.0138	0.0130	0.0100	0.0103	0.0112	0.0073

Table 4 shows the comparisons of accuracy, sensitivity, and specificity for the SVM and the ANN for the dialysis dataset. We found that the SVM achieved a classification accuracy of 0.7667 with a sensitivity of 0.7673 and a specificity of 0.7807. The ANN model achieved a classification accuracy of 0.8229 with a sensitivity of 0.8310 and a specificity of 0.8433. These results also showed that the ANN outperformed the SVM.

Conclusion

We used an SVM and an ANN as tools for mining data related to acute renal failure. Our results indicated that an ANN outperformed an SVM in terms of prediction accuracy. One of the reasons for superior performance of an ANN over an SVM is that an ANN assumes the

convexity of the acceptable cases and an ANN relaxes this assumption. Both the SVM and ANN outperform traditional statistical discriminate analysis.

Table 4. Results of predicted the patients' dialysis for 10-fold cross-validation for all folds and all model type

Fold No.	SVM			ANNs		
	Accuracy	Sensitivity	Specificity	Accuracy	Sensitivity	Specificity
1	0.7501	0.7609	0.7614	0.8202	0.8312	0.8415
2	0.7725	0.7602	0.7859	0.8126	0.8370	0.8526
3	0.7770	0.7858	0.7915	0.8270	0.8420	0.8425
4	0.7583	0.7582	0.7920	0.8126	0.8383	0.8531
5	0.7762	0.7761	0.7829	0.8131	0.8216	0.8329
6	0.7537	0.7864	0.7828	0.8037	0.8326	0.8426
7	0.7526	0.7802	0.7826	0.8330	0.8300	0.8425
8	0.7523	0.7517	0.7726	0.8326	0.8317	0.8516
9	0.7950	0.7526	0.7625	0.8450	0.8326	0.8315
10	0.7788	0.7605	0.7925	0.8288	0.8126	0.8425
Mean	0.7667	0.7673	0.7807	0.8229	0.8310	0.8433
St. Dev.	0.0153	0.0135	0.0115	0.0126	0.0085	0.0075

While classification approaches can help physicians diagnose acute renal failure, our experiments with learning association rules show that risk assessment expert systems can be developed. In the fight against acute renal failure, we believe that the combination of association rules and classification approaches will provide an effective means for the accurate and economical diagnosis of acute renal failure.

Several other approaches can be used for learning algorithms relevant to acute renal failure. For example, in this study we did not use a popular machine learning technique called ID3 (Quinlan, 1986), logistic regression (LR) (Worth & Cronin, 2003), or a classification and

regression tree (CART) (Neeley et al., 2007). Although, ID3, logistic regression, and CART provide classification rules, these do not output certainty factors. For this reason, we selected association rules. ID3, LR, and CART, however, provide information regarding the most important discriminatory attributes, which make these candidates for future investigation. In the future, work in this area may focus on the use of ID3, LR, and CART for learning decision trees using existing data on acute renal failure.

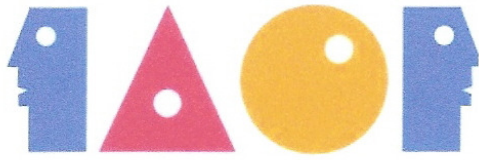
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MEASUREMENTS ON TAIWAN'S NATIONAL CUSTOMER
SATISFACTION: EMPIRICAL RE-EXAMINATION ON
FOUR REPRESENTATIVE PRODUCTS

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Abstract

The field of customer satisfaction has become an important marketing issue. While most of study is based on the customer satisfaction of a product or an industry, however, there are a relatively few studies associated with "national" level in Taiwan. The National Customer Satisfaction (NCS) has become the major issue for a country to enhance its product competitiveness worldwide. This study could help understand the current customer satisfaction situation of Taiwanese representative products. The study selected the Motorcycles, the 3C Products, the Apparels, and the Foods as four representative products, and adopted a questionnaire survey approach to empirically investigate customer satisfaction of the products by the NCS model. The customer satisfaction of Taiwanese Products was ranked on average or higher. The overall score of four products was ranged from 68 to 75 points, of which the score of Foods was rated in the highest level. The constructs of Repurchase Intention and Distance to Ideal Products could be used as the indicator of NCS in Taiwan. Some findings were consistent with the argument proposed by Fornell. It concluded that the NCS model could be applied into Taiwan economy without significantly modified.

Keywords: National Customer Satisfaction, NCS, CSI, TCSI

Introduction

Background and Motivation

In recent years, the field of customer satisfaction, which has played an important role in the aspect of marketing research since the 70's, moves forward to the new direction of the research. Kotler (1999) proposes the concept of National marketing which is stressed from the national level and is the necessity of marketing issues. Sweden, the leading country in the world, has undergone the research of customer satisfaction from the aspect of "national" to establish the international competitiveness indices for its national products. Fornell (1992) and Anderson et al. (1994) has revealed a number of national customer satisfaction (NCS) indices for the representative products of the nation. So far, however, there is space for this kind of research to be discussed thoroughly.

Firstly, in recent years, Taiwan promotes the NCS to enhance national competitiveness, which is mainly based on the producer's point of view. Although the research has been shifted to focus on national customer satisfaction, there are a few studies associated with the use of original NCS model. Therefore, it is necessary to re-examine the feasibility to adopt the origin NCS model into Taiwan economy.

Secondly, Fornell (1992) and Anderson et al. (1994) still dominated their surveys in Europe and the United States. The emerging Asian countries, strengthening in their economy and

competitiveness, have a few this sorts of reports published. It is hopefully expected that the study can aim on exploring national customer satisfaction of the representative products.

Research Purposes

Accordingly, the purposes of this study were summarized as followings:

1. Select the representative products for the consumer survey to gauge public views on customer satisfaction and to identify its determining factors.
2. Find out the difference of NCS among the representative products.
3. Re-examine the feasibility to apply the NCS model within the Taiwan economy.

Literature Review

The Definition for Customer Satisfaction Model

The customer, before purchasing a product, will have some extend of expectation to the desired product. The satisfaction, which customer's purchasing evaluation will meet or exceed his original expectations, refers to the result of a variety of shopping options. On the contrary, if the evaluation can not reach his expectations, unsatisfactory happens.

Before exploring the attitudes and satisfaction, it needs to clarify the relationship between service quality and attitude. Comparing to the product quality, it is extremely difficult to define and measure the service quality (Parasuraman et al. 1988), because the characteristics of the service are not tangible, not be stored, and not be standardized. Therefore, Parasuraman et al.

(1988) suggests that service quality can be substituted by the attitude of customers. Although some scholars believe that this practice is not necessarily accurate (Cronin & Taylor, 1992), there is no obvious difference between attitude and service quality in researches.

Therefore, the attitude is still regarded as valid indicators for the quality of service. Most scholars believe that the satisfaction of the customer is determined by its "expectations for the product" and "awareness on product performance", which may interference between the each other. Moreover, the satisfaction or dissatisfaction can even be expressed by the difference between the two (Oliver, 1980, 1981). If the actual performance of products meets the expectation or even exceeds what is expected, then the customer will feel satisfactory or very satisfactory, and vice versa. Accordingly, "customer satisfaction" refers to the result by comparing its benefits of buying behavior to their inputs and its expected benefits (Churchill & Suprenant, 1982).

National Customer Satisfaction, NCS

Customer satisfaction may reflect on satisfaction to the extent that customer consumes products or services provided by a business or any group. A national survey on customer satisfaction, through which a country's citizen consumes certain products or service provided by manufacturers or the government, will be reflected on the perceived satisfaction nation-wide. This result will have a considerable impact on the government monetary and industrial policy, on

enterprise operation and competitive policy, and on consumer purchasing decisions and consumer behavior.

Sweden is the first country to establish a "National Customer Satisfaction Index", which was conducted by Fornell (1989), in National Quality Center, University of Michigan, referred to as the Swedish model. After the index was significantly used in Sweden for six years, Germany and the United States decided to adopt the model. In 1991, Japan also announced its NCS Index which was incorporated by the country of the United States and Japan.

The scholar in Taiwan also tries hard to domestically establish Taiwan Customer Satisfaction Index, TCSI, although the Taiwan authority dose not stress on this issue. Lee et al. (2007) tries to formulate a TCSI model, and strongly advocates it for Taiwan industries. And he tests it in the amusement parks industry to demo the feasibility of TCSI model. The follower, Hu et al. (2008), uses Structural Equation Model, SEM, to conclude a modified TCSI model for the knowledge-based technology industry and medical service industry respectively. However, the TCSI seems to have lost its heat in academic research and lack supports from the authority. So, there is space to re-exam the feasibility of NCS model in Taiwan, although the scholars suggest that the NCS model should be amended before applying into the Taiwan economy.

Professor Fornell deems that there are lots of shortcomings in the generally used country's economic indicators, such as the consumer price index, CPI. It is better to have suitable

measurements to identify the relationship between the competitiveness of economies and living standards. Without considering the quality factor, the measurement, neither productivity index nor consumer price index, is not accurate at all. The major factors affecting market demand are consumer's subjective feelings, rather than a number of specifications or engineering standards. However, most of the measurement focuses on the supply side of the output. The customer satisfaction stresses on the extent that the product or service fit with the demand side. Therefore, Fornell was trying to make up the shortcomings of country's economic indicators by obtaining from results of the Customer Satisfaction Index, CSI.

The Swedish CSI is based on rational expectations theory. The degree of customer satisfaction is subject to the effect of pre-purchase expectations and post-purchase perceived performance. The empirical studies (Tes, 1998) have shown that the latter one may have greater impacts than those of the former one on the degree of customer satisfaction. The increase in consumer satisfaction will lead to the increase in customer loyalty, and vice versa. Therefore, the Swedish model is built on the construct of satisfaction, pre-purchase expectations, post-purchase perceived performance, loyalty, and complain. The cause-effect between these constructs is resulted from the study of consumer behavior.

In addition, the United States also recognized the need to build a new indicator regarding to its productivity in order to helpfully well understand its economic status. The mentioned

quality indicator must have the following four functions: (1) be able to awaken the public and manufacturers to value highly to the quality; (2) must be able to correctly measure the economic output; (3) should be able to measure competitiveness; (4) can help the public better understand the content of quality. After thoroughly understanding about the quality, the American Customer Satisfaction Index (ACSI) was established, referred to as the American model. (Fornell et al., 1996)

Research Methods

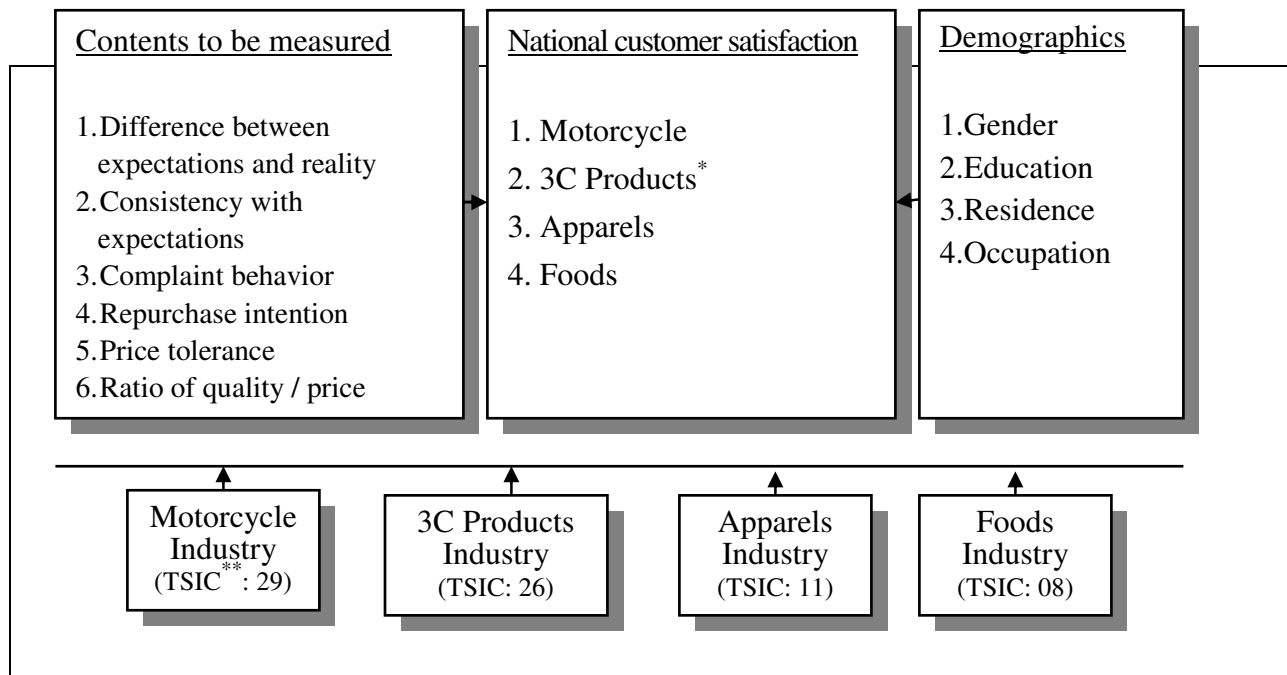
Research Framework

The research framework was shown in Figure 1. The research focused on the Fornell model, proposed in 1992, to measure customer satisfaction, by measuring the difference of six constructs between expectations (pre-purchase) and reality (post-purchase). The demographic variables were also analyzed to identify their effect on the NCS.

Study Design

Lee et al. (2007) proposes to follow the guidance of the Taiwan Standard Industry Classifications, TSIC, to determine the scope of the TCSI sampling. This study selected four products, which are classified as 08 (Foods), 11 (Apparels), 26 (3C Products), and 29 (Motorcycle) in the TSIC. The rationale to select the four representative products was based on the characteristic that their customers could be easily and directly contacted. The study used

questionnaire method to collect data from the touchable customers. In order to benefit comparison nation-wide, the questionnaire was designed to follow the major constructs of



* Computer, Communication, and Consumer Electronic related Products
 ** Taiwan Standard Industry Classifications, TSIC.

Figure 1. Research Framework

Swedish Research, which was properly translated and amended into Chinese. The constructs were designed to measure the following:

- The difference between expectations and reality (the higher expectation, the more satisfaction).
- The consistency with the expectations (the closer the expectations, the more the satisfaction, Confirmation / Disconfirmation).

- The complaint behavior to the clerk (informally) and to the company (formally).
- The repurchase intention.
- The price tolerance (the more acceptable to higher price, the more satisfaction).
- The quality / price ratio.

This survey followed the original study of Fornell (1992) which used a seven-point scale of Likert, except the Overall Rating (C10) using a scale of 100 points, to measured each product with ten questions. There were 40 questions in total for the four products. In addition, there were also 4 more questions regarding to demographic variables, including gender, education, residence, and occupation, which were taken as nominal scale constructs.

Questionnaire Sampling Designs

In the study, a Judgmental Sampling method was used to collect data. The sampling frame was shown in Table 1. There were 180 samples taken according to the variables of

Table 1. Sampling Distribution Table

	Taichung	Tainan	Kaohsiung	Total
30 years old (inclusive)	30	30	30	90
31 years old (or more)	30	30	30	90
Total	60	60	60	180

residential area and age, ranging over Taichung, Tainan, and Kaohsiung metropolis, located in the central and southern of Taiwan. The questionnaire was deployed around from the middle of June to the end of September, 2011.

Data Analysis Methods

This study adopted the following statistical tools for data analysis:

- Descriptive statistics: including mean and standard deviation.
- Correlation analysis: explaining overall satisfaction relationship derived from the aforementioned six items.
- Regression analysis: finding the overall explanatory power derived from the six satisfaction items.
- Analysis of variance and t-test: comparing the difference in the degree of satisfaction with respect to the demographic variables of gender, residence, and occupation.

Data Analysis

Mean and Standard Deviation

This section illustrated the overview of public opinions and the degree of their dispersion regarding to the overall of satisfaction for the four representative products.

The Motorcycle

As showed in the first column of Table 2, in terms of the average, the Motorcycle had the greatest value in the Price (C2, 4.64). There was the minimal value in the Price Tolerance (C8, 1.98). If the middle value of 3.50 was the threshold value, it could see that people on domestic

motorcycles had the highest satisfaction in regarding to the Price (C2), Repurchase Intention (C9) and Distance to Ideal Products (C5), but the Price Tolerance (C8) was the lowest one. The Conformation of Expectation (C4) was not expected to be higher. The mean of Overall Rating (C10), 68.62, was in the moderate satisfaction status.

Table 2. The Description Analysis for the Industries

Industry Constructs	The Motorcycle			The 3C Products			The Apparels			The Foods		
	counts	min/max	mean/sd	counts	min/max	mean/sd	counts	min/max	mean/sd	counts	min/max	mean/sd
C1	177	1/7	3.09/1.03	176	1/7	3.16/1.12	176	1/7	3.10/1.11	176	1/7	2.85/1.07
C2	177	2/7	4.64/1.03	176	1/7	3.69/1.13	176	1/7	3.65/1.23	176	1/7	3.48/0.99
C3	177	1/7	3.58/1.16	176	1/7	3.40/1.12	175	1/7	3.35/1.14	176	1/7	3.08/0.99
C4	177	1/5	2.64/0.83	176	1/5	2.55/0.85	176	1/5	2.54/0.84	176	1/5	2.35/0.76
C5	177	1/7	4.19/1.20	176	1/7	3.97/1.27	176	1/7	3.94/1.29	176	1/7	3.59/1.23
C6	177	2/5	3.18/0.62	176	1/6	3.09/0.70	176	1/5	2.97/0.60	176	1/5	2.91/0.60
C7	177	2/5	3.09/0.51	176	1/5	3.01/0.61	176	1/5	2.99/0.48	176	1/5	2.99/0.50
C8	177	1/5	1.98/0.70	176	1/5	2.26/0.73	176	1/5	2.20/0.77	176	1/7	2.41/0.74
C9	176	1/7	4.40/1.33	176	1/7	4.07/1.37	175	1/7	4.44/1.35	176	1/7	5.06/1.14
C10	173	20/99	68.62/11.02	167	40/95	68.81/11.72	149	20/95	68.48/14.89	165	50/99	75.38/9.55

Note: The symbol of the Construct was defined as following:

- C1: Quality
- C2: Price
- C3: Satisfaction
- C4: Conformation of Expectation
- C5: Distance to Ideal Products
- C6: Informal Complaint
- C7: Formal Complaint
- C8: Price Tolerance
- C9: Repurchase Intention
- C10: Overall Rating (the score of TCSI)

The 3C Products

As indicated in the second column of Table 2, the mean of Repurchase Intention (C9) for the 3C Products had a maximum value of 4.07. The Price Tolerance (C8) was with a minimum of 2.26. If the median of 3.50 as a threshold value, it could see that the people on domestic 3C Products had the highest satisfaction regarding to the Repurchase Intention (C9) and Distance to Ideal Products (C5), although its Price (C2) was not cheaper. Whereas, there were relatively lower in the degree of Price Tolerance (C8) and Conformation of Expectation (C4). The mean of Overall Rating (C10), 68.81, was in the moderate satisfaction status.

The Apparels

As listed in the third column of Table 2, the mean of the Repurchase Intention (C9) for the Apparels had a maximum value of 4.44. There was a minimum value in the Price Tolerance (C8, 2.20). If the median of 3.50 was a criteria value, it could see that the people on the domestic Apparels had the highest satisfaction regarding to the Repurchase Intention (C9) and Distance to Ideal Products (C5), although those Price (C2) was not cheaper. The Price Tolerance (C8) and Conformation of Expectation (C4) were still in the relatively lower level. The mean of Overall Rating (C10), 68.48, was all in the moderate satisfaction status, too.

The Foods

As indicated in the fourth column of Table 2, the mean value of the Repurchase Intention (C9) on the Foods had the greatest value of 5.06. There was a minimum value in the Price Tolerance (C8, 2.41). If the median of 3.50 was threshold value, it could see that people on domestic Foods had the highest satisfaction regarding to the Repurchase Intention (C9) and Distance to Ideal Products (C5), although those Price (C2) was not cheaper. The Price Tolerance

(C8) and Quality (C1) were in relatively lower level. The average of Overall Rating (C10), 75.38, was in the moderate satisfaction status.

Discussed with their mean and standard deviation, there were higher satisfaction in constructs of the Repurchase Intention (C9) and Distance to Ideal Products (C5) for products of 3C Products, Apparels and Foods. Moreover, with the less satisfaction in the Price Tolerance (C8), it indicated that people in Taiwan had lower tolerance on prices. It reflected that the people were not often satisfied on the price, and, therefore, it always had a bargain in the scenarios of the purchase. In addition, the level of the Complaint (C6, C7) was not high, which indicated individuality and expression of the people were less conservative than those of the West. The people in Taiwan were more reluctant to express their own voice. In summary, the public satisfaction with these products was ranging from moderate to above average.

The t-test

This section adopted t-test to analyze the satisfaction of Gender with respect to the four different products. It was found that, in $4 * 10 = 40$ items, only the Price (C2) and the Informal Complaint (C6) for the Apparels differed significantly with the Gender variable. The means of the female, 3.83 and 3.05 respectively, were higher than those of male, 3.44 and 2.86 respectively. It explained that, while women were buying the Apparels, they would often express their complaint to the clerks (Informal Complaint (C6)), and even they would do more bargain with the clerk than male buyers do.

Analysis of Variance

The ANOVA was used to analyze the impact on satisfaction caused by the variables of Residence, Gender, and Occupation.

The Motorcycle

The effect of the variables of Residence, Gender, and Occupation with respect to ten constructs was shown in the first column of the Table 3. Among the ten constructs, only the variable of Occupation had significant impact on the item of Conformation of Expectation (C4). However, the demographic variable of Gender and Occupation had shown in-significant among the constructs.

The 3C Products

The effect of the variables of Residence, Gender, and Occupation with respect to the ten constructs was listed in the second column of the Table 3. Among the ten constructs, the variable of Occupation had significant impact on the item of Informal Complaint (C6) and Repurchase Intention (C9). The variable of Gender also had significant impact on the item of Price (C2). However, the demographic variable of Residence had shown in-significant to the constructs.

Table 3. ANOVA - Determinants of Each Industry

	Motorcycle		3C Products				Apparels		Foods					
	Occupation		Gender		Occupation		Occupation.		Residence		Gender		Occupation	
	Sig.	R ²	Sig.	R ²	Sig.	R ²	Sig.	R ²	Sig.	R ²	Sig.	R ²	Sig.	R ²
C1														
C2			*	0.039					**	0.065			*	0.078
C3											**	0.054		
C4	**	0.123									*	0.049	**	0.108
C5														
C6					*	0.064								
C7											**	0.068	*	0.079
C8							*	0.069			*	0.048		
C9					*	0.066	**	0.083						
C10									**	0.072	*	0.042	*	0.077

Note: * significant at 0.05 level; ** significant at 0.01 level

The Apparels

The effect of the variables of Residence, Gender, and Occupation with respect to the ten constructs was shown in the third column of the Table 3. Among the ten constructs, the variable

of Occupation had significant impact on the item of Price Tolerance (C8) and Repurchase Intention (C9). However, the demographic variable of Residence and Gender had shown insignificant to the constructs.

The Foods

The effect of the variables of Residence, Gender, and Occupation with respect to the ten constructs was shown in the fourth column of the Table 3. Among the ten constructs, there were two, five and four constructs, respectively, having impact on the demographic variable of Residence, Gender, and Occupation. Obviously, the variables all had significant impact on the constructs.

Correlation Analysis

Using the correlation analysis to test the overall score, this section analyzed the correlation between the education history and satisfaction of the public with respect to the constructs.

The Motorcycle

As shown in Table 4, there were nine satisfaction constructs significantly correlated with the variables of the Motorcycle Individual Score, while the variables of Education history was generally in-significantly correlated with the constructs, except significantly with C9.

Table 4. Correlation Analysis: the Motorcycle

	C1	C2	C3	C4	C5	C6	C7	C8	C9
Individual Score (C10)	-0.389*	-0.253*	-0.344*	-0.268*	-0.24*	-0.292*	-0.257*	0.227*	0.4*
Education History	-0.129	-0.129	-0.133	-0.105	-0.134	0.0005	0.044	0.048	0.183*

Notes: * significant at 0.05 level

The 3C Products

In Table 5, there were eight constructs significantly correlated with the score of the 3C Products Individual Score, while the score of Education history was generally in-significantly correlated with the constructs, except significantly with C6.

Table 5. Correlation Analysis: the 3C Products

	C1	C2	C3	C4	C5	C6	C7	C8	C9
Individual Score (C10)	-0.453*	-0.131	-0.383*	-0.277*	-0.369*	-0.256*	-0.163*	0.23*	0.457*
Education History	-0.012	-0.091	-0.104	-0.123	-0.122	-0.16*	-0.078	0.048	0.057

Notes: * significant at 0.05 level

The Apparels

As listed in Table 6, there were five constructs significantly correlated with the score of the Apparels Individual, while the score of Education history was in-significantly correlated with the constructs.

Table 6. Correlation Analysis: the Apparels

	C1	C2	C3	C4	C5	C6	C7	C8	C9
Individual Score (C10)	-0.354*	-0.1	-0.364*	-0.207*	-0.328*	0.027	-0.038	-0.114	0.35*
Education History	-0.035	-0.028	0.058	-0.019	-0.04	0.119	0.139	0.136	0.037

Notes:* significant at 0.05 level

The Foods

As illustrated in Table 7, there were seven and five constructs significantly correlated with the score of the Foods Individual Score and Education history, respectively.

Table 7. Correlation Analysis: the Foods

	C1	C2	C3	C4	C5	C6	C7	C8	C9
Individual Score (C10)	-0.458*	-0.273*	-0.478*	-0.434*	-0.327*	-0.149	-0.134	0.155*	0.447*
Education History	-0.092	-0.193*	-0.205*	-0.26*	-0.153*	-0.074	-0.091	0.137	0.152*

Notes:* significant at 0.05 level

In this study, the correlation analysis suggested that:

1. In the Individual scores (C10), the four products were highly correlated with the most of constructs.
2. In the Education history, only the Foods products revealed highly correlated. It indicated that the Education history would guide the customers to buy against their own favorite foods.
3. In the Individual score (C10) among the four products, the Repurchase Intention (C9) was obviously significantly positively correlated; The Quality (C1), Satisfaction (C3), Conformation of Expectation (C4), and Distance to Ideal Products (C5) were apparently significantly negatively correlated. Moreover, the Formal Complaint (C7) was significantly correlated with two products, the Motorcycle and 3C Products. This could be attributed from the introverted characteristic of the nationals.

Regression Analysis

Taking $p < 0.01$ as the criteria, the result of Stepwise Regression Analysis was summarized in Table 8. There were four constructs reaching a significant level in the individual sector of the Motorcycle and the Foods, respectively. There were three and two constructs, respectively, reaching a significant level in the sector of 3C Products and Apparels. Among the constructs, the Repurchase Intention (C9) obviously reached significant levels individually in four products. And the Quality (C1) also reached significant levels individually in three products.

It implied that the Repurchase Intention (C9) and the Quality (C1) could be the representative variables to depict the characteristics of the national customer satisfaction.

Table 8. Regression Analysis of Four Industries

	Motorcycle	3C Products	Apparels	Foods
Intercept	80.09	63.88*	66.72*	70.13*
C1	-2.20*	- 2.56*		- 2.54*
C2	-1.82*			
C3			- 3.35*	
C4				- 2.58*
C5				
C6	-2.24*			
C7				
C8		3.41 *		2.15*
C9	2.47*	2.54*	2.07*	2.58*

Note: * significant at 0.05 levels

Conclusions and Recommendations

Conclusions

In this study, the four representative products (the Motorcycle, 3C Products, Apparels, and Foods) illustrated that the national customer satisfaction could serve as the valuable reference for the national leaders to develop its national competitive strategy.

The population of this survey is the nationals of the Republic of China on Taiwan. The Judgmental Sampling Method was used for sampling a total of 180 samples taken from the geographical area around Taichung, Tainan, and Kaohsiung areas, located in the central and southern of Taiwan. In each questionnaire, there were ten constructs for each product to measure customer satisfaction. Additionally, there were four demographic variables in the study. Totally, there were 46 questions in each questionnaire.

The six findings of the empirical research were listed as the following:

The level of satisfaction for the nationals was ranging from moderate to above average. The average scores for people on the overall score of the Motorcycle, 3C Products, Apparels, and Foods were ranging from 68 to 75 points, among that the Foods was at the highest score. There were relatively lower means of the four representative products in the construct of Conformation of Expectation (C4). It could be explained that the difference in post- and pre-purchase expectation was widened. The customers often experienced with unsatisfied shopping.

It was not significant for Gender in the difference of customer satisfaction. In this study, the t-test was used to analyze the difference of satisfaction in Gender. The scores of female were remarkable higher than those of male on the constructs of Prices (C2) and Informal Complaint (C6) for the Apparels product.

Indeed, demographic variables significantly affected the customer satisfaction. In this study, the ANOVA analysis was applied to discriminate the differences in the variable of Residence, Gender, and Occupation. It found the demographic variables indeed significantly had impacts on the customer satisfaction.

The Overall Rating (C10) was significant related to all of constructs, including Quality (C1), Price (C2), Satisfaction (C3), Conformation of Expectation (C4), Distance to Ideal Products (C5), Informal Complaint (C6), Formal Complaint (C7), Price Tolerance (C8), and Repurchase Intention (C9).

The NCS model could be applied onto the Taiwan economy without significantly modified. It found that the constructs of Repurchase Intention (C9), Distance to Ideal Products (C5), and Quality (C1) could be used as the indicators of national customer satisfaction. The analysis always revealed that Repurchase Intention (C9) and Distance to Ideal Products (C5) reached the level of significance. This finding was consistent with the arguments proposed by

Fornell in 1992. Although the score of the Quality (C1) was lower than that of the first two, still many consumers took it as an indicator of concern. This was also consistent with the findings of Fornell et al. (1996) for the American model to focus on the aspect of quality.

Recommendations

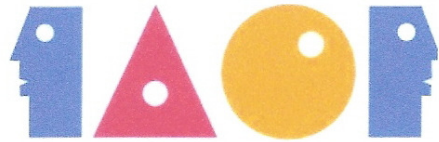
The customer satisfaction for the people of Taiwan was only at moderate level. It could be seen that the people for four products, after either purchase or use, were not totally satisfied. It implied that their expectations did not consistent after the purchase at all (even worse than they had expected). This mostly caused them to dissatisfy with the product they had purchased. The study has re-examined the national customer satisfaction for Taiwan. In addition to demographic variables, it used the ten constructs to measure the customer satisfaction of a product. It finally concluded six findings. Although this was only the initial study, it has established a complete scale for national customer satisfaction.

The results indicated that, except that of Foods, the level of satisfaction for the Motorcycle, 3C Products, and Apparels was relatively low. The firms would be on their way to enhance their competitiveness by upgrading and innovating operations for the three products. Otherwise, in the era of WTO, the weak enterprise would be eliminated one by one. The scale was applied only in the area of Taichung, Tainan, and Kaohsiung. The results of the survey could not represent the satisfaction of domestic products for whole Taiwan. It was only a feasible test by transforming the content of the model from English into Chinese.

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THE EFFECTS OF MARKETING STRATEGIES ON CUSTOMER VALUE OF
AN ENTERPRISE – WITH CORPORATE CULTURE AS THE MODERATOR

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Abstract

With the rapidly economic development, the national income, living standard and consuming capacity are also promoted; both service quality and corporate image has become the key in consumer satisfaction. It is not easy to hold a space in the market and be agreed by consumers with purchase intention and actual purchase that businesses have pondered on establishing marketing strategies to attract consumers.

With questionnaire survey, total 470 copies are distributed to the managers and customers of The Brother Taiwan. Within the collected 340 copies, 104 incomplete ones are deleted to make 236 valid copies. Through SPSS, Factor Analysis, Regression Analysis, and Hierarchical Regression Analysis are utilized for data analyses.

The research findings show that (1) Marketing Strategies present significantly positive effects on Customer Value, (2) Corporate Culture appears remarkably positive effects on Marketing Strategies, (3) Corporate Culture displays notably positive effects on Customer Value, and (4) Corporate Culture reveals significant moderating effects on Marketing Strategies and Customer Value. At the end, the research outcomes are expected to provide transnational enterprises with Marketing Strategies and Customer Value for effective execution and development.

Key words: Marketing Strategies, Customer Value, Corporate Culture, transnational enterprises,

Introduction

The 20th century was regarded as the period with the most rapidly economic development. With the rapid expansion of information technology and the globalized and internationalized economy and trade, the progress of information technology facilitated diverse business service channels. The emergence of service economy and customer awareness forced enterprises to re-inspect themselves, create favorable marketing strategies to enhance customer value, and establish permanently competitive advantages so as to assist companies in further development, making profits, and creating customer loyalty. In such a competitive environment where products are rapidly updated, diverse, and continuously reduced prices, customer preference and purchase behaviors have become the key factors in the industrial competition. How to appeal customers and win the preference is critical. Since customers are the core of an enterprise, businesses which provide products and services would expect to receive the best allocation of customer's expenses. Aiming at creating new customers, remaining original customers, and acquiring the devotion of customers, enterprises have to stress on the feelings of customers and provide products and services with special value in order to generate customer's purchase intention. For marketers, customer demands need to be realized before creating, communicating, and delivering Customer Value (Solomon et al., 2006). In face of production-oriented markets turning to customer-oriented ones, passively waiting for customers is no longer suitable. Enterprises can ensure the competitive status in the market by actively understanding customer needs and demands, providing products and services to satisfy customers, proposing marketing strategies to enhance the value of products and services, and creating Customer Value.

Literature Review

Marketing Strategies

Kotler (1991) proposed that Marketing Strategies allowed a business to achieve the marketing objective with marketing logic, such as decisions on marketing expenses, marketing mix and marketing resource allocation. With the differences in resources and capacity, enterprises would apply distinct marketing strategies, and the industrial characteristics and the environment faced by an enterprise would affect the formulation of marketing strategies. According to the definitions in literatures, Marketing Strategies were regarded as an overall marketing plan for achieving corporate objective or product-based market objective; aiming at the expected competition, the characteristics, resources, and relative competitive advantages of an organization corresponding to the overall strategies in the organization could support the marketing mix and allocation in the overall marketing system. Liu (2010) divided Marketing Strategies into Target market, Marketing mix, and Marketing expense standard, which were applied to this study as 1.Target market, the focused market segmentation, 2.Marketing mix, the flexible marketing variable, and 3.Marketing standard, the marketing budget required for various marketing strategies.

Customer Value

Sweeney and Soutar (2001) indicated that, when evaluating Product value, customers would take expected performance, money price value, pleasure and joy from using products, and social identify into account before introducing the products to others. Kotler (2003) regarded Customer Value as customer evaluation on the product satisfying the demands. Lin and Peng (2009) considered “devotion” as the perceived sacrifice of customers, including money price and non-money price of time, research, and spirit costs; while “acquisition” as quality concept, which focused more on service quality than product quality. Prashant (2009) concluded Customer Value as the overall evaluation on customer perception of the paid products or services. This

study applied the dimensions proposed by Kotler (1999) for Customer Value. 1. Product value, as the prior factor in purchase, referred to the meaning of products, whose value was generated from the functions, characteristics, quality, types, and styles. 2. Service value, for which Bolton and Drew (1991) proposed a multi-stage pattern for customers to measure service quality and value and classified the service evaluation into the phases of service performance, service quality, and service value. 3. Individual value contained sense of belonging, love, self-esteem, sense of achievement, social affirmation, fun and excitement, security, social benefit, mind peace, and social identity, according to Parry (2002). 4. Image value, as the factor in corporate image facilitating sales or purchase behaviors of customers (Griffin, 2002).

Corporate Culture

Messmer (2001) considered Corporate Culture as an invisible style or overall impression of an enterprise covering the hidden bottom, guaranteed organizational structure or more formal operations and interactions, and visible policies and programs (Meng, 2010). Originated from philosophy idea, culture could strongly affect the employment rule in a company. Besides, the behaviors of the authorities could become the norms of employees (Robbins, 2001). According to the organizational characteristics of introversion/extroversion and flexibility/control, Cameron and Quinn (1999) developed four patterns for Corporate Culture. 1. Bureaucratic culture, in which the hierarchy in the organization was definite, the work was standardized and fixed, the attitude was cautious and conservative, and risks were planned and changes were refused. 2. Innovative culture, in which the working environment was open, harmonic, and interpersonal interaction emphasized. The organization presented the attitude of support, trust, encouragement, and openness that such culture showed highly mutual cooperation. 3. Supportive culture. An enterprise had to face complex and changeable environment, and the work of employees were

full of creativity and risks. In this case, employees with entrepreneurial spirit and ambition were likely to succeed. Such culture stressed on the challenge and innovation of employees, respected individual uniqueness, and allowed risks. 4. Efficient culture, where performance and efficiency were emphasized, mutual competition was experienced, and large risks and changes often appeared.

Correlations among Marketing Strategies, Corporate Culture, and Customer Value

Hung (2009) defined marketing as business behaviors from customer value. Liu (2010) indicated that, in the individualized consuming era, customer value was affected by natural environment, social culture, technology, economy, politics, marketing strategies, and psychological factors, i.e., they were mentally satisfied by products. As a result, businesses should master in Customer Value for effective marketing. Significantly positive correlations therefore appeared in between Marketing Strategies and Customer Value. Prashant (2009) regarded market orientation as a kind of Corporate Culture, where necessary Customer Value-oriented behaviors (such as Marketing Strategies) were efficiently and effectively preceded as well as advantageous values were created for customers so as to become the selected object for sustainable management. Remarkable correlations therefore appeared among Corporate Culture, Customer Value, and Marketing Strategies.

Messmer (2001) argued that marketing was the process of formation, pricing, promotion, and allocation to plan and execute ideas, products, and services related to Corporate Culture, aiming to create exchange and satisfy individual and organizational objectives. For this reason, Corporate Culture presented notably positive correlations with Marketing Strategies.

This study aims to discuss the relations and effects among Marketing Strategies, Customer Value, and Corporate Culture. Based on the research objective and literature review, the following hypotheses are further proposed.

Hypothesis 1 (H1): Marketing Strategies presents significantly positive effects on Customer Value.

Hypothesis 2 (H2): Corporate Culture reveals remarkably positive effects on Marketing Strategies.

Hypothesis 3 (H3): Corporate Culture appears notably positive effects on Customer Value.

Hypothesis 4 (H4): Corporate Culture shows remarkable moderating effects on Marketing Strategies and Customer Value.

H4-1 Bureaucratic culture presents significant moderating effects on Marketing Strategies and Customer Value.

H4-2 Innovative culture displays notable moderating effects on Marketing Strategies and Customer Value.

H4-3 Supportive culture reveals outstanding moderating effects on Marketing Strategies and Customer Value.

H4-4 Efficient culture shows remarkable moderating effects on Marketing Strategies and Customer Value.

Research Methods

Research Framework

This study aims to discuss the significant relations between Corporate Culture, Marketing Strategies and Customer Value in an enterprise. Based on literature review, the conceptual framework is established as below.

Sampling and Sample Analysis

With random sampling, the owner, managers, and employees in The Brother were distributed questionnaires. The Brother was established in Japan in 1908, and has presently

established 19 branches and 47 sales offices in 43 countries. For more than one century, it has sold laser printers, multi-functional machines, fax machines, labeling machines, home/industry sewing machines in Taiwan. The Brother Groups Global Charter formulates Basic Policies for insisting on quality, placing the customer first, and protecting the environment. The Charter clearly states, “The Brother Group's mission is to place our customers first everywhere, every

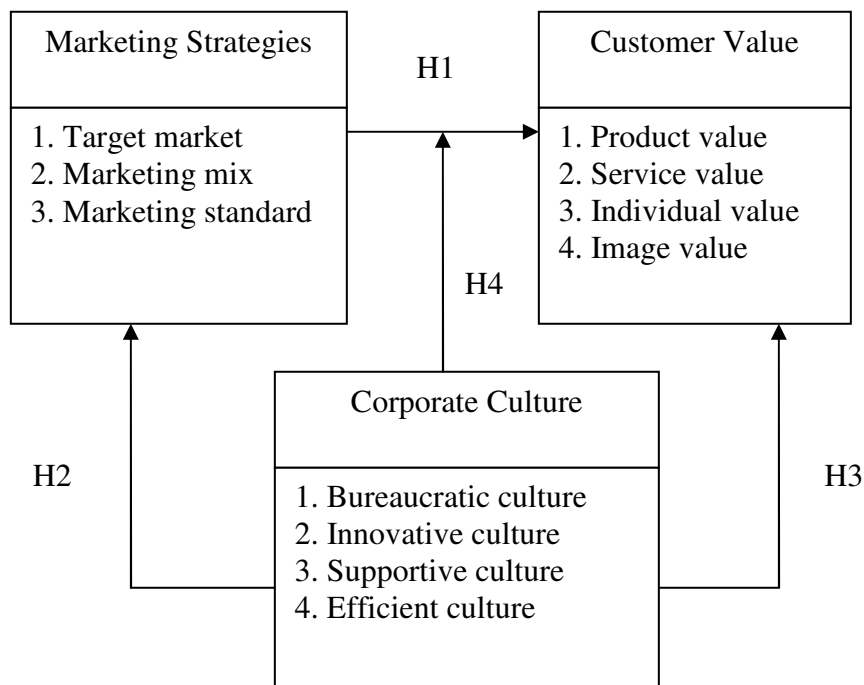


Fig. 3-1 Research framework

time, and provide them with superior value, by quickly creating and delivering high-quality products and services.” The Brother also insists on the tradition and spirit of manufacturing so that it could create and provide excellent values for customers with the products and services. Total 470 questionnaires were distributed and 340 copies were collected. Deducting 104 incomplete ones, total 236 valid copies were retrieved.

Analysis and Discussion

Factor Analysis of Marketing Strategies

With Factor Analysis, three elements were abstracted for the Marketing Strategies scale, namely Target market (Eigen value=2.658, Cronbach's α =0.838), including major customers, customer demands, and customized products, Marketing mix (Eigen value=1.696, Cronbach's α =0.811), containing price stability and product diversity, and Marketing standard (Eigen value=1.337, Cronbach's α =0.800), covering sales preference and brand value. The variance explained reached 81.299%.

Multiple Regression Analysis of Marketing Strategies and Customer Value

From Table 1, Target market, Marketing mix, and Marketing standard presented significantly positive effects on Product value ($\beta=0.151$, $p<0.05$; $\beta=0.155$, $p<0.05$; $\beta=-0.222$,

Table 1: Multiple Regression Analysis of Marketing Strategies and Customer Value

Dependent variable \ Independent variable	Customer Value			
	Product value	Service value	Individual value	Image value
Marketing Strategies	0.151*	0.086	0.027	0.254***
Target market	0.155*	0.082	0.495***	-0.086
Marketing mix	0.222**	0.235***	0.274***	0.129
Marketing standard				
F	11.451	7.433	44.8	8.642
Significance	0.000***	0.000***	0.000***	0.000***
R ²	0.129	0.088	0.367	0.101
Regulated R ²	0.118	0.076	0.359	0.089

Note: *P<0.05 **P<0.01 ***P<0.001

Data source: Organized in this study

$p<0.01$); Target market showed remarkably positive effects on Service value ($\beta=0.235$, $p<0.001$); Marketing mix and Marketing standard appeared notably positive effects on Individual value

($\beta=0.459$, $p<0.001$; $\beta=0.274$, $p<0.001$); and, Target market revealed significantly positive effects on Image value ($\beta=0.254$, $p<0.001$). H_1 therefore was partially agreed.

Multiple Regression Analysis of Corporate Culture and Marketing Strategies

From Table 2, Supportive culture and Efficient culture displayed notably positive effects on Target market ($\beta=0.188$, $p<0.01$; $\beta=0.135$, $p<0.05$); Innovative culture presented remarkably positive effects on Marketing mix ($\beta=0.032$, $p<0.001$); and, Bureaucratic culture showed remarkably positive effects on Marketing standard ($\beta=0.269$, $p<0.001$). H_2 therefore was partially agreed.

Table 2: Multiple Regression Analysis of Corporate Culture and Marketing Strategies

Independent variable \ Dependent variable	Marketing Strategies		
	Target market	Marketing mix	Marketing standard
Corporate Culture			
Bureaucratic culture	-0.066	-0.349***	0.269***
Supportive culture	0.188**	-0.103	0.053
Innovative culture	-0.038	0.032***	0.092
Efficient culture	0.135*	-0.136*	-0.084
F	3.078	23.461	5.081
Significance	0.017*	0.000***	0.001**
R ²	0.051	0.289	0.081
Regulated R ²	0.034	0.277	0.065

Note: * $P<0.05$ ** $P<0.01$ *** $P<0.001$

Data source: Organized in this study

Multiple Regression Analysis of Corporate Culture and Customer Value

From Table 3, Supportive culture and Innovative culture appeared significantly positive effects on Marketing mix ($\beta=0.244$, $p<0.001$; $\beta=0.140$, $p<0.05$); Supportive culture and Efficient culture appeared notably positive effects on Service value ($\beta=0.132$, $p<0.05$; $\beta=0.198$, $p<0.01$); Innovative culture and Efficient culture showed remarkably positive and negative effects on

Individual value ($\beta=0.265$, $p<0.001$; $\beta=0.126$, $p<0.05$); and Bureaucratic culture and Efficient culture presented significantly positive effects on Image value ($\beta=0.223$, $p<0.01$; $\beta=0.190$, $p<0.01$). H₃ therefore was partially agreed.

Table 3: Multiple Regression Analysis of Corporate Culture and Customer Value

Dependent variable Independent variable	Customer Value			
	Product value	Service value	Individual value	Image value
Corporate Culture				
Bureaucratic culture	0.067 0.244***	-0.264*** 0.132*	-0.186** 0.044	0.223** 0.078
Supportive culture	0.140* -0.189**	-0.030 0.198**	0.265*** 0.126*	0.037 0.190**
Innovative culture				
Efficient culture				
F	7.488	5.934	8.494	7.611
Significance	0.000***	0.000***	0.000***	0.000***
R ²	0.114	0.093	0.128	0.116
Regulated R ²	0.099	0.077	0.113	0.101

Note: *P<0.05 **P<0.01 ***P<0.001

Data source: Organized in this study

Moderating effects of Corporate Culture

1. Effects of Bureaucratic culture on the relations between Marketing Strategies and Customer Value

With Hierarchical Regression Analysis, Bureaucratic culture appeared outstanding differences on the relations between Target market, Marketing mix and Product value, between Marketing standard and Service value, between Target market, Marketing standard and Individual value, and between Target market and Image value. H4-1 therefore was partially agreed.

Effects of Bureaucratic Culture on the Relations Between Marketing Strategies and Customer Value

Marketing Strategies	Product value	Service value	Individual value	Image value
Target market	Significant	Not-Significant	Significant	Significant
Marketing mix	Significant	Not-Significant	Not-Significant	Not-Significant
Marketing standard	Not-Significant	Significant	Significant	Not-Significant
Hypothesis test	H4-1 partially agreed			

2. Effects of Innovative culture on the relations between Marketing Strategies and Customer Value

With Hierarchical Regression Analysis, Innovative culture revealed notable differences on the relations between Marketing mix, Marketing standard and Product value, between Target market, Marketing mix and Service value, between Target market, Marketing mix and Individual value, and between Marketing mix, Marketing standard and Image value. H4-2 was therefore partially agreed.

Effects of Innovative culture on the Relations Between Marketing Strategies and Customer Value

Marketing Strategies	Product value	Service value	Individual value	Image value
Target market	Not-Significant	Significant	Significant	Not-Significant
Marketing mix	Significant	Significant	Significant	Significant
Marketing standard	Significant	Not-Significant	Not-Significant	Significant
Hypothesis test	H5 partially agreed			

Effects of Supportive culture on the relations between Marketing Strategies and Customer Value

With Hierarchical Regression Analysis, Supportive culture appeared remarkable differences on the relations between Target market and Product value, between Target market,

Marketing mix, Marketing standard and Service value, between Target market, Marketing mix and Individual value, and between Marketing standard and Image value. H4-3 therefore was partially agreed.

Effects of Supportive Culture on the Relations Between Marketing Strategies and Customer Value

Marketing Strategies	Product value	Service value	Individual value	Image value
Target market	Significant	Significant	Significant	Not-Significant
Marketing mix	Not-Significant	Significant	Significant	Not-Significant
Marketing standard	Not-Significant	Significant	Not-Significant	Significant
Hypothesis test	H6partially agreed			

Effects of Efficient Culture on the Relations Between Marketing Strategies and Customer Value

With Hierarchical Regression Analysis, Efficient culture showed significant differences on the relations between Target market, Marketing mix, Marketing standard and Product value, between Target market, Marketing mix and Service value, between Target market, Marketing standard and Individual value, and between Target market, Marketing mix and Image value. H4-4 therefore was partially agreed.

Effects of Efficient Culture on the Relations Between Marketing Strategies and Customer Value

Marketing Strategies	Product value	Service value	Individual value	Image value
Target market	Significant	Significant	Significant	Significant
Marketing mix	Significant	Significant	Not-Significant	Significant
Marketing standard	Significant	Not-Significant	Significant	Not-Significant
Hypothesis test	H7partially agreed			

Conclusion and Suggestions

Summing up the data analyses and research conclusions, suggestions for practical applications to Marketing Strategies are proposed as follows.

1. Network transaction platform. For competitive advantages in marketing, enterprises should learn to stand on customer's position, always listen to customer expectation and demands, and instantly reply and response. With the rapid speed and low cost of high technology to satisfy customer demands, network transaction platform is utilized in the environment. Network transaction platform provides more convenience for customers that enterprises should concern about customers and design the most convenient way for customers to acquire products and reduce costs. When customers could contact with the enterprise, search for the data of the enterprise, and easy to purchase, the enterprise would receive more chances to appeal and satisfy customers.
2. Establishing excellent brand image. A favorable brand image of an enterprise could assist customers in reducing purchase risks and enhance purchase confidence. A vivid brand allows customers to receive social and psychological benefits beyond the product function and further affect the choice and preference. A brand could help customers visibly understand the invisible services, enhance the trust to purchase such invisible products, and reduce the risks of price and security. Moreover, customers would identify values as the brand of an enterprise.
3. Promoting staff quality. When creating and delivering Customer Value, employees present the functions of knowledge standard and marketing capacity. The ideas, innovative awareness, and professional dedication spirit of employees could directly affect the awareness of Customer Value. For this reason, an enterprise should emphasize employee

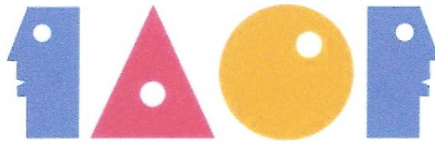
trainings. Enterprises could promote staff quality with trainings, encourage the enthusiasm of employees with internal marketing by authorizing the first-line service personnel, and strengthen internal management to promote the staff quality.

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ESTIMATION OF RECREATIONAL BENEFITS FROM
A GLOBAL POSITIONING SYSTEM

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Abstract

In recent years, emerging technologies have been largely utilized in the creation and improvement of travel information products, which can effectively promote tourists' recreational benefits. Among those products, GPS navigation system is an important utilization. This study applies non-market goods valuation method to estimate the benefits of improving recreational qualities derived from GPS navigation system and to find out the variables that influence recreational benefits. In addition to the evaluation of tourists' benefits when using navigation system, this study also estimates the expected benefits for potential users who are not using navigation systems now and verifies the difference between the two kinds of benefits, with a hope of assisting the provision of manufacturers' marketing planning information. Convenience sampling method was applied to collect the samples and 815 valid samples were received. Findings of this study on variables indicated that the probabilities that respondents were willing to pay were higher for GPS products with value-added or deluxe functions. The probabilities of willingness to pay declined as the selling price increased. Respondents who took outdoor activities as their major recreational activities, who were easier to lost their directions, who were more possible to accept new products and who had higher incomes were more willing to pay. As far as the prices that users and potential users were willing to pay were concerned, the average willing-to-pay price of user samples were USD381.9; that of potential users samples were USD386.7. After the verification of the differences, it was discovered that there were no significant differences between the willing-to-pay prices by these two kinds of users. As far as the different functions that user group and potential user group were willing to pay for were concerned, there was a significant difference between the two groups about the willing-to-pay

price for basic functional products. However, in respect of value-added and deluxe functions, there was no clear difference between users and potential users.

Key word: Global positioning system, recreation benefits, contingent valuation method.

Introduction

Along with unprecedented changes in urban and rural landscapes, an increasing number of overhead viaducts, as well as denser and more complicated networks of highways and roads, have emerged. Consequently, drivers often get lost or feel frustrated when looking for the right way. When tourists choose to drive by themselves, they often need to refer to maps or collect road information, wasting much time asking for directions and collecting information. Moreover, drivers often get lost due to unclear signs or outdated maps, go the opposite road due to wrong instructions received, and meet accidents due to unfamiliarity with the local environment and people. In the end, tourists come happily but return gloomily.

A global positioning system (GPS) navigation system (hereinafter referred to as GPS NS) provides relevant traffic information and leads tourists to their preferred destinations. With GPS NS, tourists have easy access to “scenic spot and traffic guides; location maps; and information on accommodation, gourmet, special products, latitude and longitude, and open hours, among others.” Aside from pointing out the direction and road, GPS NS also shows correct directions at intersections, crossings, and interchanges, or when switching between fast and slow lanes. With the system, tourists need not take tour guidebooks or worry about getting lost. They will also find it easier and quicker to plan routes. The system also gives instructions on the best traveling route, thus helping save time, effort, and fuel. Along the journey, tourists could change the route freely and GPS NS changes its direction accordingly. Therefore, tourists who choose to drive drives by

themselves could just relax and enjoy the scenery along the road if they are accompanied by relevant GPS NS devices. Generally, the recreational quality of traveling is improved.

GPS NS products will be extensively used in the future, and the marketing strategies of manufacturers—cost and advertising strategies—will influence the market proliferation of the products. Manufacturers should understand consumer preferences and demands to develop suitable marketing strategies. Assessing the benefits of GPS NS to travelers also helps manufacturers cater to consumer needs. Specifically, this will help them set the price of their various products. Moreover, manufacturers must understand the response of travelers to these strategies.

Therefore, this study assesses the benefits of GPS NS to travelers. Furthermore, understanding the expectations of potential users on the benefits of GPS NS provides information for manufacturers to develop appropriate marketing strategies. Hence, this study assesses and compares the benefits derived by existing and potential users from GPS NS.

In this study, we assess the major benefits enjoyed by tourists from GPS NS, and estimate the benefits of using GPS NS in improving the tour quality of existing and potential users through the contingent valuation method (CVM). The results may serve as basis for GPS manufacturers to explore the future market.

Literature Review

Recreational Benefits

Contingent valuation method (CVM) simulates hypothetical market transactions through questionnaire designs, determines the public's willingness to pay (WTP) or willingness to accept (WTA) qualitative or quantitative changes through some hypothetical questions, and assesses changes in consumer utility levels. CVM originated from Wantrup (1947), who believed that

questionnaires could be designed to examine the WTP of respondents for the additional provision of non-market goods. The model was originally designed to estimate the benefits derived by consumers from public goods. Davis applied CVM in assessing outdoor recreational benefits from forests in Maine, USA in 1964, making him the first to apply CVM for the assessment of recreational resources. Moreover, with their evaluation of waterfowls in 1974, Hammack and Brown started the extensive application of CVM (Mitchell and Carson, 1989). Below is an introduction to the assessment of recreational benefits using CVM and the inquiry method.

Dixon and Hufschmidt (1986) adopted CVM to assess recreational benefits from Lumpinee Park in Bangkok, Thailand, and took the assessment results as basis for decision making. They valued the derived recreational benefit at \$5.83 million. Using the travel cost method (TCM) and CVM, Brown and Henry (1989) estimated the recreational value of tourists' appreciation of African elephants in Kenya. TCM estimated the derived benefit at \$23 million per year and CVM estimated tourists' WTP to maintain the existing quantity of African elephants at \$89 per person. Similarly, Hanley and Spash (1983) estimated recreational benefits from Elizabeth Park (Scotland) by TCM and CVM. The total benefits estimated by TCM and CVM were £160,000 and £180,000, respectively.

Inquiry Method

CVM generally uses open, closed (or discrete or binary choice), or payment card methods of inquiry. The discrete choice method is more popular among researchers (Arrow et al., 1993; Carson et al., 2001; Organization for Economic Co-operation and Development, 2002; Nunes and van den Bergh, 2003). Hoehn and Randall (1987) suggested that the "closed condition" method could avoid bias errors, and this survey method could better elicit true reactions from

respondents and minimize strategic errors found in the questionnaire survey method. Cameron (1988) averred that the binary choice method conveys more messages than the traditional discrete choice method. Boyle and Bishop (1988) proposed that “closed” bidding is the easiest and least time-consuming method, which also conforms to the shopping habits of respondents. Kristrom (1990) asserted that the discrete choice method, in comparison with the open questionnaire method, has the advantages of “reducing rejection rates, avoiding extreme values, and creating a hypothetical scenario close to the market that respondents face each day.” Duffield and Patterson (1991) suggested that the binary choice method asks respondents to or not to accept a certain amount, which is the most convenient, suitable, effective, and practical way of conducting surveys. This method also has the advantages of reducing the pressure on respondents and eliminating bias errors.

The single-boundary binary choice model has the advantages of avoiding bias errors and strategic errors, reducing rejection rates, and avoiding extreme values; hence, this study adopts the single-boundary binary choice model proposed by Hanemann et al. (1991) in estimating the benefits of using GPS NS in improving the recreational quality of travel.

Theoretical Foundation and Assessment Methodology

Theoretical Foundation of the Benefits of Using GPS NS in Improving Recreational Quality

It is presumed that “individuals” know the volume of their consumption. This is described by the following basic model:

$$\text{Max } U = U(X, Q) \quad (3-1)$$

$$\text{s.t. } P_X X + P_Q Q = I$$

where X is the quantitative vector of private goods, P_X is the price vector of X goods, Q is the quantitative vector of recreational goods, P_Q is the price vector of Q goods, and I is income.

The utility maximization issue is solved through the Lagrange method, that is, obtaining Marshall's consumer demand function $X_i = X_i(P_X, I - P_Q Q, Q)$, and putting this demand function into the target function to obtain the indirect utility function $V = V(P_X, P_Q, I, Q)$.

When the recreational quality changes, respondents have WTP to maintain the same utility level. When the recreational quality improves from Q_0 to Q_1 , respondents are willing to spend part of their income for the benefits derived from the improved recreational quality. The maximum amount they are willing to pay is WTP, expressed as

$$V(P_X, P_Q, I, Q_0) = V(P_X, P_Q, I - \text{WTP}, Q_1) \quad (3-2)$$

Formula 3-2 indicates that when the recreational quality is Q_0 and the other conditions remain unchanged, the utility level of income I is equal to that of $I - \text{WTP}$ after the recreational quality improves to Q_1 . In other words, respondents are willing to pay the highest amount of WTP for the utility level corresponding to the improvement in recreational quality from Q_0 to Q_1 .

Method To Assess The Benefits Of Using GPS NS In Improving Recreational Quality

By discrete choice CVM, we can not directly observe the benefits derived by respondents from GPS NS in terms of improved recreational quality. Hence, the study must estimate WTP through an empirical model. As mentioned in the literature review, this study intends to adopt the single-boundary binary choice model proposed by Hanemann et al. (1991) to estimate the benefits from improved recreational quality.

The CVM empirical model has two different methods. The first method is to take the indirect utility gap under different quality levels as the reaction function of dependent variables, estimate the probability of respondents answering "yes" or "no" through the empirical model, and calculate the WTP of respondents through integration, that is, the indirect utility function method proposed by Hanemann (1984). The second method is to take the difference of expense

function as the reaction function of dependant variables, that is, the expense function method proposed by Cameron and James (1987). McConnell (1990) asserted that the main difference is in the setup of the reaction function. When the marginal utility of income is constant or the random item is 0, the two methods are related. Therefore, this study takes the indirect utility function as the basis in measuring benefits.

Hanemann (1984) applied the entity theory to evaluate benefits derived from environmental goods and proposed an empirical study by taking differences in the indirect utility model as the reaction function. He suggested that in relation to respondents, the utility theory includes an unobserved random item aside from certain items. Therefore, he proposed the random utility theory and predicted the probability function of respondents' WTP through probit and logit regression models. These models are often used by empirical studies under closed CVM. Below is a brief introduction of their theoretical foundations.

The indirect utility function examines the choice of respondents under different situations, or estimates the WTP of respondents by considering their reaction toward better recreational quality Q and payment $\$A$, as well their feelings (better or worse) after an additional payment of $\$A$ when their WTP cannot be directly observed. The study assumes that the factors influencing respondents' utility level include recreational quality (Q), income (Y), and social and economic variable (S).

The study further assumes that the indirect utility function of respondents is as follows:

$$V = V(Y, Q, S) + \varepsilon \quad (3-3)$$

where Y is the income of respondents, Q is the tour's recreational quality, S is the social and economic features of respondents, and ε is a random item $\varepsilon \sim^{iid} (0, \sigma_\varepsilon^2)$.

Hence, the indirect utility function of respondents is set to $V(S, Y, Q)$. The respondent may choose not to pay \$A and maintain the original recreational quality Q_0 , or choose to pay \$A for better recreational quality Q_1 . The indirect utility models V_0 and V_1 under these two situations, respectively, represent the utility level of original and better recreational quality. The models are expressed as

$$V_0 = V_0(Q_0, Y_0, S) + \varepsilon_0 \quad (3-4)$$

$$V_1 = V_1(Q_1, Y_0 - A, S) + \varepsilon_1$$

where Q_0 and Q_1 represent original and better recreational quality, respectively; Y_0 and $(Y_0 - A)$ indicate the original level of income and that after paying \$A; and ε_0 and ε_1 are random error terms that are mutually independent, satisfying the condition that the expected value is zero.

When the respondent is willing to pay the amount quoted in the questionnaire for better recreational quality, it indicates that after the respondent has paid an amount of A , the income is reduced to $Y - A$, but the recreational quality improves and the utility level is not lower than the original level, expressed as

$$V_1(Y - A, Q_1, S) + \varepsilon_1 \geq V_0(Y, Q_0, S) + \varepsilon_0 \quad (3-5)$$

$$\text{Or } V_1(Y - A, Q_1, S) - V_0(Y, Q_0, S) + \varepsilon_1 - \varepsilon_0 \geq 0$$

The study assumes $\Delta V = V_1(Y - A, Q_1, S) - V_0(Y, Q_0, S)$, $\theta = \varepsilon_0 - \varepsilon_1$. Given that ΔV and θ cannot be observed, there is need only to observe whether the respondent is willing to pay the amount of \$A. If this reaction is expressed by the index variable I , $I = 0$ indicates “not willing to pay” and $I = 1$ indicates “willing to pay,” as expressed in the following formula:

$$I = \begin{cases} 1, & \text{when } \Delta V \geq 0 \\ 0, & \text{Other situations} \end{cases} \quad (3-6)$$

The probability that the respondent is willing to pay \$A to obtain better recreational quality is expressed as

$$P_{r1} = P_r(\text{The respondent is willing to pay \$A to obtain better recreational quality}) \\ = P_r(I = 1) = P_r(\Delta V \geq \theta) = F_\theta(\Delta V) \quad (3-7)$$

where $F_\theta(\cdot)$ is the cumulative probability density function of the random variable θ . Similarly, the probability that the respondent is not willing to pay \$A is expressed as

$$P_{r1} = P_r(\text{The respondent is not willing to pay \$A to obtain better recreational quality.}) = P_r(I = 0) \\ = P_r(\Delta V < \theta) = 1 - F_\theta(\Delta V) \quad (3-8)$$

The function distribution pattern of random variables influences the estimation results and is generally assumed to be a logistic or normal distribution. Logistic and normal distribution functions only remarkably differ at the tail; they are quite close at the middle. Hence, there is no large difference. This study adopts the logit model as the computational model to estimate the WTP of respondents.

If random items have logistic distribution patterns, it is suitable to adopt the logit model, and the function pattern is expressed as

$$P_{r1} = F_\theta(\Delta V) = \frac{1}{1 + \exp(-\Delta V)} \quad (3-9)$$

In the empirical estimation, we need to designate the specific function pattern for the difference in indirect utility model, mainly the linear function or nonlinear logarithmic function of income (Hanemann, 1984). However, the estimation results of the linear and algorithmic-linear functions are not significantly different. Hence, this study uses only the linear indirect utility function to estimate the WTP of respondents. After the respondent's social and economic variable (S) is added, certain items of the indirect utility model about two choices of a given

respondent when faced with the payment of \$A (willing = 1, not willing = 0) could be expressed as

$$V_1(Q_1, Y - A, S) = \alpha_1 + \beta_1(Y - A) + \gamma_1 S \quad (3-10)$$

$$V_0(Q_0, Y, S) = \alpha_0 + \beta_0 Y + \gamma_0 S$$

The utility difference of respondents' ΔV could be expressed as

$$\Delta V = (\alpha_1 - \alpha_0) + (\beta_1 - \beta_0)Y - \beta_1 A + (\gamma_1 - \gamma_0)S \quad (3-11)$$

The marginal utility of income, whether or not the respondent is “willing” or “not willing,” is kept unchanged; hence, $\beta_1 = \beta_0$.

The study assumes that $\alpha = (\alpha_1 - \alpha_0)$, $\gamma = (\gamma_1 - \gamma_0)$; hence, Formula 3-11 could be simplified as

$$\Delta V = \alpha - \beta_1 A + \gamma S \quad (3-12)$$

If the respondent is willing to pay \$A to obtain better recreational quality, it indicates that the indirect utility gap is $\Delta V \geq \theta$. The probability model regarding the respondent's willingness to pay \$A is expressed as

$$P_{r1} = P_r(\Delta V \geq \theta) = F_\theta \{ \alpha - \beta_1 A + \gamma S \} \quad (3-13)$$

The estimated values of unknown parameters in the formula could be obtained using the maximum likelihood function that is, applying the maximum likelihood estimation (MLE), maximized first-order conditions, and Newton–Raphson iterative method.

The likelihood function could be expressed as

$$\ln L = \sum_{i=1}^N \left[I_i^Y \ln F_\theta(\Delta V(A_i, S)) + I_i^N \ln (1 - F_\theta(\Delta V(A_i, S))) \right], \quad (3-14)$$

where N is the number of respondents, and A_i is the price that i th respondent faces. If i th respondent answers “yes,” $I_i^Y = 1$, $I_i^N = 0$. If the respondent answers “no,” $I_i^Y = 0$, $I_i^N = 1$.

WTP for the benefits of improved recreational quality could be estimated through the average WTP estimation method proposed by Hanemann (1984).

In the model, $f_A(A)$ indicates the probability density function of the willingness to pay \$A. Further, $F_A(A)$ is the accumulative distribution function of $f_A(A)$, and $F_A(A)$ indicates the accumulative probability density function of the willingness to pay an amount lower than \$A. Hence, the WTP probability is $1 - F_A(A)$, $1 - F_A(A) = P_{r1} = F_{\theta}(\Delta V)$.

The expected value of WTP is expressed as

$$E(WTP) = \int_{-\infty}^{\infty} A \cdot f_A(A) dA = \int_0^{\infty} [1 - F_A(A)] dA - \int_{-\infty}^0 F_A(A) dA \quad (3-15)$$

$$= \int_0^{\infty} F_{\theta}(\Delta V) dA - \int_{-\infty}^0 [1 - F_{\theta}(\Delta V)] dA$$

The minimum price A is 0 and cannot be negative; hence, the lower integral limit of the second item in the formula above is 0 and the upper integral limit is revised to the highest bid price. Hence, the expected value of WTP could be revised as

$$E(WTP) = \int_0^{A_{MAX}} F_{\theta}(\Delta V) dA \quad (3-16)$$

The study assume a normal and logistics distribution of the linear utility function,

$$V_0(Q_0, Y_0, S) + \epsilon_0 = V_1(Q_1, Y_0 - A, S) + \epsilon_1, \text{ because } E(\Delta \epsilon) = 0. \text{ Formula 3-17 could be}$$

obtained from Formula 3-12.

$$A^* = \frac{(\alpha + \gamma S)}{\beta_1} \quad (3-17)$$

Materials and Empirical Model

Questionnaire Survey And Data Analysis

Data came from the questionnaire survey. Price was quoted through the binary choice method in the questionnaire and was divided into ten different groups. Surveyors carried out the questionnaire survey from May 16 to 21, 2007. Samples were collected in two stages. The first stage adopted proportional allocation, that is, they distributed questionnaires based on the population proportion of Taiwan's counties and cities. In the second stage, interviewers in counties and cities chose respondents through convenience sampling. A total of 800 samples were collected through this survey. After incomplete or invalid questionnaires were deleted, 645 valid samples were obtained, yielding a valid recovery rate of about 81%.

Empirical Model and Variable Description

The probability model regarding respondents' willingness to pay \$A is built from the above theory, expressed as

$$P_{r1} = P_r(\Delta V \geq \theta) = F_\theta\{\alpha - \beta_1 A + \gamma S\}, \quad (4-1)$$

where A is the price that a given respondent faces, i.e., the "money" variable in the empirical model, and S indicates social and economic variables and other explanatory variables. Table 4-1 shows the detailed descriptions and definitions of variables used in estimating improvements in recreational quality by GPS NS.

Empirical Estimation Result Of GPS NS In Improving The Recreational Benefits

This study also assesses recreational benefits enjoyed by both existing and potential users and examines the differences, as shown in the following formula:

$$H_0: WTP_{existing\ user} = WTP_{potential\ user} \quad (5-1)$$

As far as the entire model's goodness-of-fit is concerned, the estimated values of the likelihood Chi-square model for the entire sample, existing users, and potential users are between 170.1619 and 1302.648, and far beyond $\chi^2(0.01, 10) = 23.21$, indicating that the model has a

strong explanatory power. Three variables all conform to the expectations. Across the entire sample, the value-added function variable (*V*), luxury function variable (*L*), price amount variable (*money*), tendency to accept new products (*Dcon*), and individual income (*Income*)

Table 4-1. Variables used in estimating improvements in recreational quality.

Name of variable	Definition	Expected symbol
<i>V</i>	Whether it has the value-added function, virtual variable, 1 for “yes” and 0 for “no”	+
<i>L</i>	Whether it has the luxurious function, virtual variable, 1 for “yes” and 0 for “no”	+
<i>money</i>	Price faced by respondent	—
<i>gender</i>	Gender of respondent, virtual variable, 1 for male and 0 for female	?
<i>age</i>	Age of respondent	?
<i>Ltime</i>	Recreational time available each week after working; normal rest hours are deducted	?
<i>outdoor</i>	Major recreational activities of the respondent, virtual variable, 1 for “mainly outdoor activities,” 0 for “mainly indoor activities”	+
<i>mis</i>	Probability that respondent gets lost	+
<i>Dcon</i>	Tendency that respondent accepts the new product	+
<i>In</i>	Monthly income of respondent	+

show significant differences at 1% level of significance. Age (*Age*) and main recreational activities (*outdoor*) show significant differences at 5% and 1% levels of significance, respectively. In the user’s estimation formula, the value-added function variable (*V*), luxurious function variable (*L*), price amount variable (*money*), tendency to accept new products (*Dcon*), age, probability of getting lost (*mis*), and individual income (*Lincome*) show significant differences at 1%–10% levels of significance.

In terms of economic connotation, when GPS NS has value-added and luxurious functions for the model considering the total sample, consumers have higher WTP probability

and the situation is quite significant. When respondents face a higher price, their WTP probability is reduced. There is no significant difference across gender, although, female respondents have higher WTP probability. In terms of age, older respondents have higher WTP probability, that is, higher willingness to buy GPS NS. Respondents with more recreational time also have higher WTP probability, as well as those who prefer outdoor recreational activities. There is no significant difference between those who get lost easily and those who do not, although those who get lost easily are more willing to buy GPS NS. Respondents who have a higher tendency to accept new products are more likely to buy GPS NS. Respondents with higher income also have higher WTP probability. In terms of the estimation model of existing and potential users, the economic connotation is roughly the same. Interestingly, user groups have more significant reactions to the “outdoor” variable. Specifically, among the user group, respondents who are mainly engaged in outdoor recreational activities are significantly different from those who are mainly engaged in indoor activities in terms of WTP. Female respondents and those with less recreational time have higher WTP, although the difference is not statistically significant. Among potential users, older respondents have higher WTP than younger people, and male respondents and those with more recreational time have higher WTP; the differences, however, are not statistically significant (Table 5-1).

In terms of the WTP of existing and potential user subgroups, the average WTP of all samples is USD389.2, whereas those of existing and potential users are USD381.9 and USD386.7, respectively. Existing and potential users do not significantly differ in terms of WTP (Table 5-2).

Table 5-1. Estimation results for the model of existing and potential users.

	All samples	Existing users	Potential users
Constant	-2.05730910 (-7.147)***	0.03059906 (0.042)	-3.204 (-8.931)***
<i>V</i>	0.64206922 (4.680)***	1.41777412 (3.938)***	0.656974 (3.953)***
<i>L</i>	4.23269537 (14.105)***	6.00806263 (6.907)***	4.844421 (13.121)***
<i>money</i>	-0.00025701 (-16.888)***	-0.00035868 (-7.649)***	-0.0003 (-15.732)***
<i>gender</i>	-0.04030891 (-0.369)	-0.28240117 (-1.019)	0.012624 (0.096)
<i>Age</i>	0.01287849 (2.333)**	0.00776328 (0.546)	0.01251 (1.857)*
<i>Ltime</i>	0.00084451 (0.172)	-0.00542789 (-0.585)	0.000373 (0.058)
<i>outdoor</i>	0.17992992 (1.680)*	0.63738485 (2.376)**	0.058843 (0.447)
<i>Mis</i>	0.38041110 (1.576)	0.91959352 (1.869)*	1.284049 (3.778)***
<i>Dcon</i>	1.29988816 (11.239)***	1.79582813 (6.706)***	0.874977 (5.963)***
<i>Lincome</i>	5.52379E-05 (17.824)***	7.4769E-06 (1.916)*	0.000101 (19.412)***
Likelihood	1,185.226***	170.1619***	1,302.648***

Note: 1. The coefficient inside the bracket is the *t* statistics.

2. $\chi^2(0.01,10) = 23.21$.

3. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

As to product functions, the average WTP values for basic, value-added, and luxurious function are USD162.5, USD249.7, and USD718.9, respectively. As to basic functions, the WTP values of existing and potential users are USD152 and USD175.3, respectively. As to value-added function, the WTP values of existing and potential users are USD244.1 and USD256.4, respectively. As to luxurious function, the WTP values of existing and potential users are USD711 and USD728.3, respectively. In terms of products with basic functions, the WTP values

Table 5-2. Differences in WTP between existing and potential users.

Subgroups	WTP average (USD)	<i>t</i> -value	<i>P</i> -value
All	389.2		
Existing users	381.9	-0.321	0.748
Potential users	386.7		

of existing and potential users significantly differ at 10% level of significance. In terms of value-added and luxurious functions, existing and potential users do not significantly differ (Table 5-3), implying that manufacturers could start from GPS with basic functions to expand their market share. Moreover, the WTP of potential users is higher than that of existing users, possibly because they hold certain expectations on unused products and are willing to pay more than existing users. From the profit-making aspect, manufacturers should explore the nature of potential users.

Table 5-3. Difference in WTP between existing and potential users based on product functions.

Product functions	WTP average (USD)	<i>t</i> -value	<i>P</i> -value
Basic function	162.5		
Existing user	152	-1.786*	0.074
Potential user	175.3		
Value-added function	249.7		
Existing user	244.1	-0.946	0.344
Potential user	256.4		
Luxurious function	718.9		
Existing user	711	-1.330	0.184
Potential user	728.3		

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Conclusion and Recommendations

In recent years, new technologies—such as GPS NS—have been used in creating and improving tour-oriented IT products. GPS NS can potentially benefit tourists by improving tour quality. However, the study cannot directly observe intangible benefits; hence, it adopted the assessment method of non-market goods to estimate the benefits derived from GPS NS in term of improved recreational quality and to determine influential variables. Aside from benefits for existing users, this study also estimated expected GPS NS benefits for potential users. The benefits were compared to provide relevant input for manufacturers to develop marketing plans. The following conclusions are drawn from the study.

1. As to the explanatory variable of recreational benefits, this study found that the performance of their symbols conform roughly to expected symbols. When the products are GPS with value-added or luxurious functions, respondents have higher WTP, which decreases with increasing price. Those who are mainly engaged in outdoor recreational activities, who get lost easily, have high tendency to accept new products, and have high income exhibit high WTP.
2. As to existing and potential user subgroups, the average price that existing users are willing to pay is USD381.9, whereas potential users are willing to pay USD386.7. The difference, however, is statistically insignificant. As to products with basic functions, the price that existing and potential users are willing to pay significantly differ. As to value-added and luxurious functions, existing and potential users do not significantly differ in terms of the price they are willing to pay.

Existing and potential users have significant differences in terms of the price they are willing to pay for products with basic functions at 10% level of significance, but such significant difference was not found for products with value-added or luxurious functions. In other words,

when exploring new consumer segments, manufacturers could attract new clients by varying the prices of GPS products with basic functions. However, this strategy is not suitable for GPS products with value-added and luxurious functions.

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