Applying IPA Model to Analyze Real Estate Marketing Strategy
- Taking Green Building as an Example

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Abstract: This article aimed at investigating the differences between strategic goal and actual performance of green building marketing. In the past, there were very few researches based on this in Taiwan area, therefore,, in this article, past literatures will be reviewed again, and theories such as "cognition-attitude-behavior model" and "EKB decision theory", which were commonly used in studying market transaction process, will be used as basis, and "importance-performance analysis (IPA)" model will also be used together to understand more the perception strength and gap on all the marketing key factor indexes from the supply end (house builder and dealer) of green building market. Based on the researches , what needed to be noticed was quadrant II: (Concentrate here) and (high importance, low performance), this part represented the area that the supply end of green building needed to improve the present situation and improve the quality harder, including three key factor indexes: "consumer emphasizes on energy saving and carbon reduction and green environment", "actual economic, social and environmental interest was key knowledge factor of green building product" and "marketing personnel emphasize on moral action meeting the social expectation", which were used as reference for preparing real estate marketing strategy and selecting improvement projects.

Key-Words: Green building, EKB decision theory, Importance-performance analysis, Real estate marketing strategy

1 Introduction

In 1996, the Executive Yuan of Taiwan had formed "Sustainable Development Council", next, in 1999, "Architecture and Building Research Institute of the Ministry of Interior" under its jurisdiction started to promote "green building label" system, therefore, when there was support of policy and regulation from the supervisory organization of the government plus the willingness of the suppliers to build and sell green building that can meet the market expectation and consumer's need, and green building market architecture of the present Taiwan area was formed many years later.

Green building product, as compared to general building product, had higher complexity in construction technology and procedure, therefore, the management and marketing fees for building and maintaining was higher, although there was compensation of Cost Premiums from the market, yet the supply was still insufficient, however, is this why the user did not feel the green effect? Or was it difficult to maintain due to higher cost? Feng-Yao Chen, for such special phenomenon in

the green building market, had proposed the explanation, and it was thought to be caused by the green feature difference favored by the user and the supplier (the user favored green feature of social aspect, and the supplier tended to provide green feature of economic aspect) [1]. Zou, Zhao, and Zhong pointed out that area imbalance did exist in the quantity of green building, and it was found from the research that localized economic basis and subsidy and encouragement policy can explain the existence and distribution of green building, however, in the overall market performance, the correlation among energy efficiency and green policy and green building density was not significant, which explained that government could, through the reduction of economic inequalities in different areas (for example, considering the additional setup of other new regulations to balance such difference), encourage and promote more green buildings to set up market oriented mechanism, consequently, public awareness could be enhanced, and continuous influence and feedback could be sent back to the government so

as to set up more efficient green policies [2].

Based on the above statement, the main objective of this article was to investigate, when green building supply end (house builder and dealer) was preparing its marketing strategy, gap (research gap) that might appear between theory and practice. Should the supply end consider its own green building knowledge, technology, cost and cognition aspects such as policy and regulation, plus the requirement on green building product, and cognition and decision preference from the public and consumer to form specific business concept and attitude so as to precisely describe overall strategies and action guidelines meeting green building marketing history, and this was the major research motivation of this article.

The objective of this research was to investigate the suppliers (house builder and dealer)of green building product, when facing with many influencing factors in the market, to see how they could use "cognition-attitude-behavior model" and "EKB decision theory", which were theories commonly used in investigating the transaction process, to explain the influence on marketing strategy from different factor indexes. Meanwhile, in this article, the research results on "green building promotional and influential factor" and "green building performance" on Taiwan area was referred to, consequently, five key factor indexes regarding "consumption need", "green knowledge", "policy and regulation", "business concept" and "integrated marketing" were extracted. Moreover, after summarization was made in this research and after applying importance-performance analysis, it was hoped that the results could be used by the supply end of green building as a management model, when facing the public and its targeting customers, for adjusting its present marketing strategy [3] [4].

2 Literature review

For the literature review regarding the subject of this research, it can be divided into three main parts, namely, the meaning of green building product, the key factor indexes of marketing strategy and important performance analysis.

2.1 The meaning of green building product

For the origin of international green building evaluation system, it could be traced back to Building Research Establishment Environmental Assessment Method (BREEAM) set up in 1990 by Building Research Establishment (BRE) in association with several departments such as energy, environment and industry [5]. Later on, more famous ones included: the evaluation systems such as LEED (Leadership in Energy and Environment Design) developed by the green building association of USA and CASBEE (Comprehensive Assessment System for Building Environmental Efficiency) developed by the sustainable building association of Japan. In Taiwan area, "EEWH system" (Four major parts such as Ecology, Energy Saving, Waste Reduction and Health) was used as the green building evaluation system, and it included nine indexes: greening on the base, water reservation on the base, water resource, daily energy saving, quantity reduction on carbon dioxide, waste reduction, waste water and garbage improvement, biological diversity and interior environment [6]. In this research, this was used as basis for policy and regulation and evaluation meaning represented by the green building.

2.2 Key marketing strategy factor indexes
2.2.1 "Cognition-attitude-behavior model" and "EKB decision theory"

"Cognition-attitude-behavior model": (1)Cognition meant the process for acquiring knowledge through the psychological activities such as the formation of concept, perception, judgment or imagination, and it also included the psychological function for conducting information processing. Chao-Ming Cheng thought that "cognition" emphasized on the investigation of psychological operation process, and it was an integrated system for thinking certain perception reaction through sensory stimulation process, and human was seen as an information transmission and processing system [7]. (2) Attitude meant one psychological phenomenon, and it not only included people's internal experience, but also included people's behavioral intention. Generally speaking, attitude was hidden, and it was mainly reflected through speech, expression and behavior. Fishbein and Ajzen thought that attitude was an intention acquired through learning, and, for specific object or idea, and it was an intermediate state using

consistent method to cognize and act [8]. (3) Behavior meant that all intentional activities of people were formed by a series of simple actions, and it was general name for all the actions displayed in the daily life. Chung-Hsin Yeh thought that behavior was formed by stimulation from the environment, and it could be observed and measured [9].

"EKB decision theory": It was proposed by three scholars, namely, Engel, Kollat and Blackwell in the period from 1968 to 1993, and it was consumption behavior decision theory architecture after several revisions [10]. The model can mainly be divided into four major parts: The first part: Information input: The search of external information formed information source, including, consumption need and product knowledge. The second part: Information processing: Including five steps such as disclosure, notice, understanding, acceptance and preservation, etc. The third part: Decision process: This part was the core of that model, and it meant the psychological process when the consumer was making decision for purchase, and it can be divided into five stages, including: (1) Problem recognition stage; (2) Information search stage; (3) Project evaluation stage: It meant the guideline, faith, attitude and intention; (4) Project choice stage; (5) Result outcome stage: It meant the customer's satisfaction or cognition disorder after purchase. The fourth part: Variables Influencing Decision Process, including: Detailed items derived from environmental influencing factor and personal difference, and for details, please see the following Fig.1.
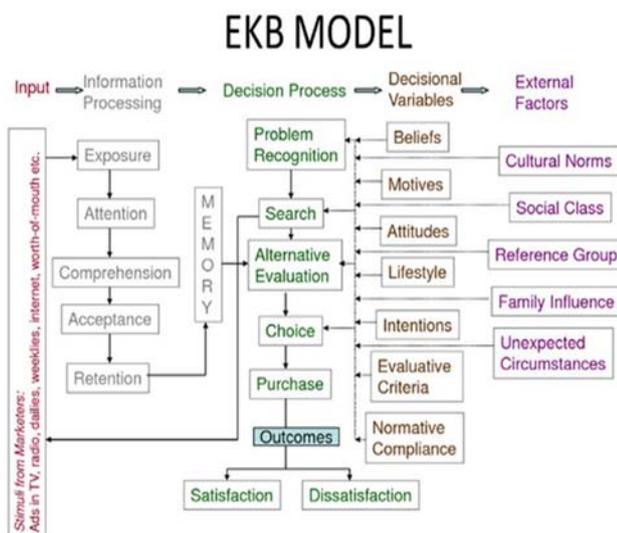
Fig.1 EKB decision theory model

Data source: EKB model [11]

2.2.2 "Consumption need" and "green knowledge"

"Consumption need": When consumers were purchasing a product, reference information they usually adopted were: Price, quality and comments from other users. In the research of Tversky & Kahneman, it was found that when the consumers were making requirement evaluation and judgment, they will rely on clear and available information as reference, and they tended to neglect information that cannot be clearly acquired [12] [13]. Under different evaluation situations, the consumers will select different requirement reference points, therefore, when the consumers were making to buy or not to buy, or comparison–type-purchase decision process, they will make choice set, that is, the so-called preference reversal effect [14]. Here, based on the related research results, when consumers in Taiwan area were facing with function, decision making and time requirement of house purchase were described as follows: (1) For functional requirement: Culture, education and school related functions, traffic and commuting, convenience for consumption, leisure planning and home security perspectives and corresponding evaluation principles were requirement factors most emphasized by the house purchase customers [15]; (2) For decision requirement: The importance order of decisive factors of house purchasing by general consumers was respectively: air circulation, security in the neighborhood, house lighting, building material of the house and home tranquil environment [16]; (3)For time requirement: The search time for house purchase by the consumers was mainly three months to six months, and there was time dependence for the probability for the house purchaser to stop search , and it will increase along with the extension of search time [17].

"Green knowledge": The core knowledge concept from Gilg, Barr, and Ford on green consumption can be mainly divided into four Rs: Reduce(reduce the consumption quantity), Reuse(repeated use), Recycle(recycle for renewing), Refuse(refuse non-environment friendly), and 3 Es: Economic, Ecological and Equitable, that is, as long as the consumers had environment friendly concept in the transaction behavior and reduced the damage to the environment during the process, it could be called green consumption [18]. Ching-Yu Lien and Yu-

Shih Chen had pointed out in green consumption knowledge: The views on green environmental protection and understanding, the acquisition and using of knowledge, and internal and external factors considered before sale and purchase (including the requirement confirmation, search and evaluation procedures) from both the supply and demand ends, as long as green consumption spirit was met, all such searches on green knowledge information belonged to it [19].

2.2.3 "Business concept" and "integrated marketing"

"Business concept": Tsai-Mei Lin and Keng-Ming Chuang thought in their research that the general called "business concept" and "managerial philosophy" can be seen as synonyms [20]. Business concept was the creed, concept and ideal kept by the manager, and it had great influence on the setup of business goal, and the decided business operation activity contents has influence on shareholder, employee and other stakeholder, business concept's performance, to the company, was the "attitude" of the manager. Ta-Wei Huang and Te-Hui Yen pointed out that the higher the level of emphasis on business concept, the higher the acceptance for the employee to accept the management model, consequently, the higher the belonging and loyalty in organizational commitment, consequently, it could have positive influence on other management perspectives (including marketing strategy) of the organization [21]. From the above statement, it was clear that the implementation target of business concept included internal and external customers such as the so-called stakeholder, and Customer Relationship Management (CRM) was one of the management concepts derived from these different customer groups. For the house builder and dealer stayed at the supply end, its launching of green building product with innovation and environment friendly spirit and sustainable development based on its business concept was also one of social responsibility expressions, and such expression also included its management capability on financial investment and operation performance [22] [23].

"Integrated marketing": It was a management way to integrate marketing and customer service and to develop synergy effect on all kinds of consumer communication ways, including brand and image making and the promotion of the achievement of sales goal, after all the brand and corporate information were conducted with strategic planning and coordination, through media, public relation, promotion, packaging and network activity ways, its technologies were integrated, and clear and consistent information was thus provided to exploit its optimal mass communication synergy [24]. Schultz thought that for the communication target of integrated marketing, it was needed to focus on consumers (target customer audience) to build relation with consumers through its brand and to get their response [25]. Duncan and Moriarty pointed out that the communication target of integrated marketing was based on all the stakeholders of the organization, and based on the long term profit consideration of the organization, it should maintain consumer's and other related people's interest [26]. To summarize, it should be emphasized that green building integrated marketing, in its concept, aimed at: Promotional activity and announcement way such as personnel's sale, distribution channel promotion, advertisement promotion and public relation.

2.3 Importance-performance-analysis method

For the Importance-Performance-Analysis (IPA) method proposed by Martilla and James, its objective was to use the analysis of the relation between the importance and its performance of product and service to assist the preparation of marketing strategy [27]. In this method, first, sample questionnaire survey was conducted, then the average scores of importance and performance were plotted into a two-dimensional matrix plot to analyze the relation between the importance and performance, then, based on the location of each factor in the plot, quality maintaining or improvement strategy was prepared, consequently, operation management suggestions were proposed. After literature review, it was found that analysis method associated IPA and SWOT appeared in the academy, and the strength and weakness represented by four quadrants of IPA matrix were analyzed so that subsequent researchers can

understand more clearly the meaning of each quadrant in operation and management aspect, for example, the quadrant I: continuing preservation area, which represented the O(Opportunities), quadrant II: strengthening improvement area, which represented T(Threats), quadrant III: sub-priority improvement area, which represented W(Weaknesses), quadrant IV: Over-supply area, which represented S(Strengths), for the distribution and meaning of the matrix plot, please see the following Fig.2 for details [28].
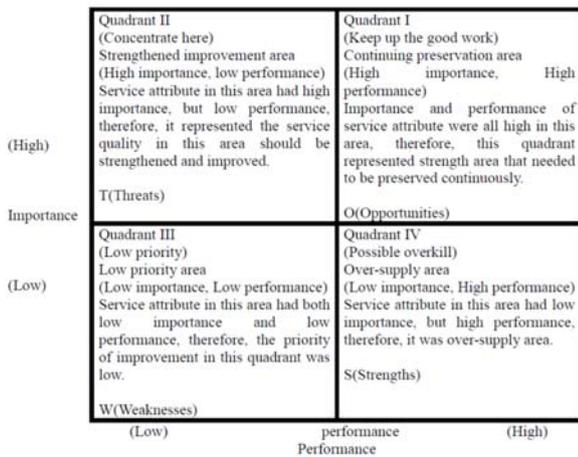

Fig.2 IPA matrix plot
Data source: [27] [28]

3 Research methods

The research methods of this article included: questionnaire design and sampling design, first, key factor indexes of green building marketing extracted from the previous research literature was referred to, after semantic summarization of each topic, questionnaire was prepared for the implementation of test.

3.1 Questionnaire design

To summarize the above mentioned literature, in this research, "cognition-attitude-behavior model" and "EKB decision theory", which were theories commonly used in the investigation of the transaction process, were used for introduction, and the research results of Shu-Hui Lan et al., and Chu-Kuang Hsieh et al [3] [4].were mainly referred to as the basis of the perspectives, then "importance-performance-analysis (IPA)" model was used to

understand the perceived strength and gap from market supply end (house builder and dealer) on the key factor index (importance and performance) of green building marketing strategy, and the key factor index involved in the rings of promoting marketing strategy by green building supply end was set up again, and when expanded, they were respectively: "consumption need", "green knowledge", "integrated marketing", "business concept" and "policy and regulation". Since this research had referred to the above two literatures, please see Table 1 for the summarization, however, since some meanings still needed to be clarified, several experts in the academy and industry were invited to make again semantic analysis and summarize on the topics one by one, later on, questionnaire of 38 key factor indexes were formed, for details, please see the research results of Table 6 in this article.

Table 1 The variables of this research, perspectives, operation definitions and literature references

Questionnaire scale of this research can be divided into two parts, the first part was the key factor index of green building marketing, and the second part was the basic information survey of the person under interview. In the former one, Likert five-point scale was used, for the person under interview,

based on his/her cognition on the key factor index of green building marketing strategy, importance was divided into "very important", "important", "fair", "not important" and "not very important"; performance was also divided into "very good match", "match", "fair", "bad match", "very bad match", later on, scores of five to one were given respectively. The latter basic information survey included: gender, age, educational background, corporate characteristic, attribute of office, employee head count, years of service in this company and job title.

3.2 Sampling design

The sample period of this research was from Nov. to December 2017, and the "Real estate development association" and "Association of real estate brokers" located at central Taiwan were used as the population, questionnaires were issued to 580 persons participating the activity, and convenience sampling way was adopted, 345 copies were returned, with deduction of 62 copies of invalid questionnaire, the effective questionnaires were 283 copies, and the effective return rate was 82.03%.

4 Empirical results

4.1 Descriptive Statistics

In the 283 copies of effective questionnaires of this research, for the mean and standard deviation of the background variable data of the persons under interview, please see Table 2.

Table 2 The mean and standard deviation

		Gender	Age	Educati onal ba ckgroun d	Corpora te chara cteristic	Office a ttribute	Employ ee head count	Years o f servic e	Job title
N	Effective value	283	283	283	283	283	283	283	283
	Missing value	0	0	0	0	0	0	0	0
Mean		1.42	4.11	2.79	1.79	1.61	2.00	2.88	3.50
Standard deviation		.494	1.050	1.050	.517	.599	.816	1.225	1.524

In addition, results were obtained from persons under test in this research regarding gender, age, educational background, corporate characteristic, attributes of location, employee headcount, years of service and job functions, and the results were as shown in table 3.

Table 3 Descriptive statistics of background variables

(1)Gender	Male 165 persons, which was 58.3% and was the most, the next was female of 118 persons, which was 41.7%
(2)Age	97 persons aged 51-60, which was 34.3% and was the most, the next was respectively: 41-50 years old (86 persons and 30.4%), 31-40 years old (61 persons or 21.6%), 21-30 years old (21 persons or 7.4%), above 61 years old (18 persons or 6.4%)
(3)Educational background	119 persons of senior high and vocational senior high school, which was 42% and was the highest, the next was respectively: university (68 persons and 24%), college (62 persons and 21.9%), below junior high school (included)(19 persons and 6.7%), graduate school (15 persons and 5.3%)
(4)Corporate characteristic	House dealer had 195 persons, which was 68.9% and was the most, the next was respectively: construction company (74 persons and 26.1%), others (14 persons and 4.9%)
(5)Office attribute	Chain store and franchise office for 139 persons, which was 49.1% and was the most, the next was respectively: Independent and single office (127 persons and 44.9%), others (17 persons and 6%)
(6)Employee head count	6-15 head count for 139 persons, which was 49.1% and was the most, the next was respectively: below 5 head count (included)(80 persons and 28.3%), 16-30 head count (52 persons and 18.4%), above 31 head count (12 persons and 4.2%)
(7)Service years of experiences	Above 1 year -5 years (included) for 93 persons, which was 32.9% and was the most, the next was respectively: above 5 years -10 years (included)(69 persons and 24.4%), above 10 years -20 years (included)(50 persons and 17.7%), above 21 years (38 persons and 13.4%), within 1 year (33 persons and 11.7%)
(8)Job title	General employee for 112 persons, which was 39.6% and was the most, the next was respectively: Middle managers (62 persons and 21.9%), president of the headquarters (56 persons and 19.8%), leaders in the basic levels (41 persons and 14.5%), presidents of branch offices (12 persons and 4.2%)

4.2 Reliability analysis

In this research, reliability analysis was conducted on topics of five perspectives of questionnaire, and analysis result showed that Cronbach's α internal consistency coefficient of "importance" was .957, Cronbach's α internal consistency coefficient of "performance" was .969, and after inspecting the correlation between the topic and total score, acceptable reliability was always seen, and the obtained results were as shown in the following Table 4.

Table 4 Perspective reliability and overall reliability coefficient

Name of variable	Number of topics in questionnaire	importance performance Cronbach's α	
Consumption need	7	.891	.916
Green knowledge	5	.890	.940
Operation concept	14	.950	.951
Policy and regulation	5	.913	.946
integrated marketing	7	.884	.929
Total	38	.957	.969

4.3 Dependent samples t test

Dependent samples t test was applicable to check if there was difference before and after a single sample, that is, to compare, for the same sample, if there was difference in importance and performance. After the test, it was found that there was significant difference in the mean value of importance and performance of this research, $t(282)=20.958$, p=.000, d=1.387. And importance

(M=4.11, SD=.47) was larger than performance (M=3.39, SD=.57), as in Table 5.

Table 5 Dependent samples *t* test

Degree	Mean (standard deviation)		Degree of freedom	*t* value	*p*	Effect size (d)
	importance	performance				
	4.11(.47)	3.39(.57)	282	20.958	.000	1.387

4.4 IPA descriptive analysis

Continuing from the above statement to use *t* test to test importance and performance, in addition to having significant difference, the mean and standardized Z value of importance and performance in each topic also had significant difference (p=0.000), and the mean score of importance was significantly higher than that of performance, please check Table 6.

Table 6 This research's variable, perspective topic, attribute label, importance and performance mean, standard deviation (Z) and significance.

Variable	Perspective topic	Attribute label	importance	performance	Z importance	Z performance	Significance (double tail)
Consumption need	Consumer emphasized on energy saving and carbon reduction and greening environment	V01	4.34	3.29	1.32	-0.40	.000
	Consumer emphasized on the use of green building material	V02	4.02	3.14	-0.49	-1.02	.000
	Consumer emphasized on overall humanistic environment atmosphere	V03	4.1	3.4	-0.04	0.05	.000
	Consumer emphasized on green building terminal sale price	V04	3.7	2.98	-2.30	-1.68	.000
	Consumer emphasized on green building product competitiveness	V05	3.72	3.09	-2.19	-1.23	.000
	Consumer emphasized on value keeping and value increasing characteristic of green building product	V06	3.88	3.16	-1.28	-0.94	.000
	Consumer emphasized on the positive influence of green building label on health	V07	4.09	3.41	-0.10	0.09	.000
Green knowledge	Saving of energy and resource was the key knowledge factor of green building product	V08	4.33	3.46	1.26	0.30	.000
	Enhance of living quality was the key knowledge factor of green building product	V09	4.18	3.4	0.41	0.05	.000
	Reduction of environment loading was the key knowledge factor of green building product	V10	4.36	3.4	1.43	0.05	.000
	Ecological environment conservation was the key knowledge factor of green building product	V11	4.28	3.39	0.98	0.01	.000
	Actual economic and social environment benefit was the key knowledge factor of green building product	V12	4.14	3.29	0.19	-0.40	.000
Operation concept	Sales personnel emphasized on the capability to have foresight in the business operation process	V13	4.19	3.63	0.47	1.00	.000
	Sales personnel emphasized on flexible information source and seizing of environment dynamics	V14	4.23	3.68	0.70	1.20	.000
	Sales personnel emphasized on the capability to develop new product	V15	4.13	3.59	0.13	0.83	.000
	Sales personnel emphasized on the creation of product to meet customer satisfaction and expectation	V16	4.3	3.66	1.09	1.12	.000
	Sales personnel emphasized on user-convenient model	V17	4.18	3.64	0.41	1.04	.000
	Sales personnel emphasized on setting up intense and interactive mechanism with customer	V18	4.2	3.62	0.53	0.96	.000
	Sales personnel emphasized on the	V19	4.05	3.41	-0.32	0.09	.000
	implementation of social basic value						
	Sales personnel emphasized on moral action to meet the social expectation	V20	4.14	3.36	0.19	-0.11	.000
	Sales personnel emphasized on financial management capability	V21	4.27	3.7	0.92	1.29	.000
	Sales personnel emphasized on credibility	V22	4.28	3.63	0.98	1.00	.000
	Sales personnel emphasized on re-investment capability	V23	4.09	3.64	-0.10	1.04	.000
	Sales personnel emphasized on the creation of revenue	V24	4.28	3.82	0.98	1.78	.000
	Sales personnel emphasized on cost control	V25	4.34	3.87	1.32	1.99	.000
	Sales personnel emphasized on the display of profit and result	V26	4.32	3.89	1.21	2.07	.000
Policy and regulation	The amendment of policy and regulation had the trend of extending the limitation on administrative control	V27	4.07	3.15	-0.21	-0.98	.000
	Policy and regulation emphasized on international green building development trend	V28	4.07	3.19	-0.21	-0.82	.000
	Policy and regulation emphasized on the expanded ecological effectiveness of green building	V29	4.01	3.23	-0.55	-0.65	.000
	Policy and regulation emphasized on the tax allowance and tax-free action of green building	V30	4.06	3.17	-0.27	-0.90	.000
	Policy and regulation emphasized on the encouragement and subsidy of green building	V31	4.1	3.14	-0.04	-1.02	.000
integrated marketing	The green building promotional activity was conducted in specific way	V32	4.06	3.14	-0.27	-1.02	.000
	The spokesman of green building promotional activity was celebrity of green image	V33	3.66	3.21	-2.53	-0.73	.000
	The green building promotional activity was conducted in multi-channel	V34	3.96	3.23	-0.83	-0.65	.000
	The green building promotional activity was conducted in concessional loan	V35	4.07	3.15	-0.21	-0.98	.000
	The case of receiving of an award by green building due to sustainable operation concept was commonly seen	V36	3.95	3.2	-0.89	-0.77	.000
	The sales personnel in the industry had the capability to explain and strengthen green building	V37	3.98	3.19	-0.72	-0.82	.000
	The sales personnel in the industry gradually had the capability to use public relation for marketing	V38	3.93	3.19	-1.00	-0.82	.000

Furthermore, the intervals of means of importance and performance of five variables (consumption need, green knowledge, business concept, policy and regulation and integrated marketing) of this research was sorted, importance was in the range from 3.94 to 4.26, and performance was in the range from 3.18 to 3.65, and the order of importance from high to low was respectively: green knowledge, business concept, policy and regulation, consumption need and integrated marketing, and the order of performance from high to low was respectively: business concept, green knowledge, consumption need, integrated marketing and policy and regulation, please see Table 7.

Table 7 The sorting of mean of importance and performance of variables of this research

Variable	Mean of importance	Ranking	Mean of performance	Ranking
Green knowledge	4.26	1	3.39	2
Operation concept	4.21	2	3.65	1
Policy and regulation	4.06	3	3.18	5
Consumption need	3.98	4	3.21	3
integrated marketing	3.94	5	3.19	4

Finally, for the proportional distribution regarding the key factor index of IPA matrix quadrant, the order from high to low was as shown below: Quadrant III (low priority area) was the highest (16 items,42.11%), the next was quadrant I (continuing preservation area)(15 items,39.47%), the next was quadrant IV (over-supply area, 4 items,10.53%), and quadrant II (strengthened improvement area, 3 items,7.89%) was the lowest, please see Table 8.

Table 8 Key factor index and proportional distribution of four quadrants

Located quadrant	Corresponding strategy	Topic	Percentage occupied to the total number of topic
Quadrant 1: (Keep up the good work) Continuing preservation area (High importance, High performance): Service-attribute importance and performance had high evaluation, therefore, this quadrant represented the strength area that should be preserved continuously	Continuing preservation area Represented O (Opportunities)	Saving of energy and resource was key factor of green building product knowledge Enhancement of living quality was key factor of green building product knowledge Reduction of environment loading was key factor of green building product knowledge Ecological environment conservation was key factor of green building product knowledge Sales personnel emphasized on the capability to have foresight during the business operation process Sales personnel emphasized on flexible information source and seizing of environment dynamics Sales personnel emphasized on the capability to develop new product Sales personnel emphasized on the creation of product meeting the satisfaction and expectation of customer Sales personnel emphasized on human-convenient model Sales personnel emphasized on setting up intense and interactive mechanism with customer Sales personnel emphasized on financial management capability Sales personnel emphasized on credibility Sales personnel emphasized on the creation of revenue Sales personnel emphasized on cost control Sales personnel emphasized on the display of profit and result	15/38 39.47%
Quadrant 2: (Concentrate here) Strengthened improvement area (High importance, low performance): Service attribute in this area had high importance, but low performance, and it represented that the service quality in this area should be strengthened and improved. Note: Key factors distributed in this area were focuses of discussion of this article	Strengthened improvement area Represented T(Threats)	Consumer emphasized on energy saving and greening of environment Actual social and environmental benefit was the key knowledge factor of green building product Sales personnel emphasized on moral action meeting social expectation.	3/38 7.89%
Quadrant 3: (Low priority) Low priority area (Low importance, Low performance): Service attribute in this area had both low importance and performance, therefore, the priority of improvement in this quadrant was low.	Sun-priority improvement area Represented W(Weaknesses)	Consumer emphasized on the use of green building material Consumer emphasized on green building terminal sale price Consumer emphasized on green building product competiveness Consumer emphasized on the value keeping and value increase of green building product The amendment of policy and regulation had the trend to loosen the control Policy and regulation had the tendency to emphasize the international green building development Policy and regulation emphasized on the effectiveness of expanding the ecology from green building Policy and regulation had tax allowance and tax-free action for green building Policy and regulation had encouragement and subsidy for green building Promotional activity of green building was conducted in specific way Promotional activity of green building had spokesman based-on celebrity Promotional activity of green building was conducted in multi-channel way Promotional activity of green building was conducted in concessional loan It was commonly seen for cases of green building receiving award and getting exposed due to sustainable operation concept Sales personnel in this business had capability to explain and strengthen green building Sales personnel in this business had the capability to use public relation for marketing	16/38 42.11%
Quadrant 4: (Possible overkill) Over-supply area (Low importance, High performance): Service attribute had low importance, but high performance, therefore, it was over-supply area.	Over-supply area Represented S(Strengths)	Consumer emphasized on overall humanistic environment atmosphere. Consumer emphasized on the positive influence of green building label on health Sales personnel emphasized on the implementation of social basic value Sales personnel emphasized on re-investment capability	4/38 10.53%

4.5 IPA model analysis

In this study, "performance" of key factor index of ring of green building marketing strategy was used as the horizontal axis (x axis), "importance" as vertical axis (y axis), through standardization procedure (Z value), the coordinate was divided into four quadrants of 1, 2, 3 and 4, finally, the average values of importance and performance of 38 key factor indexes of this research were put in, then it was summarized into IPA matrix plot, please see Fig.3.
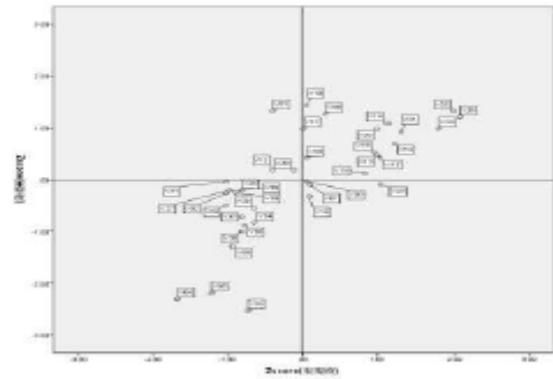

Fig.3 Distribution chart of key factor index of green building marketing

5 Conclusions
5.1 Results

The differences in emphasis level and performance from person under test himself/herself on the key factor index of the organization operation: What needed to be noticed was that quadrant II(Concentrate here) was strengthened improvement area (high importance, low performance), and this part represented that the non-profit organization should strengthen its improvement on enhancing the overall quality of this area, including: three key factor indexes such as "consumer emphasizes on energy saving and carbon reduction and green environment", "actual economic, social and environmental interest was key knowledge factor of green building product" and "marketing personnel emphasize on moral action meeting the social expectation", and these three items were all service attributes emphasized by the customers, however, the present organization performance was relatively bad, and there were several key items waiting to be improved. Except quadrant II, Quadrant IV (Possible overkill), over-supply area (low importance and high performance) included: four key factor indexes such as "consumer emphasizes on overall humanistic environment atmosphere", "consumer emphasizes on the positive influence of green building label on health" and "marketing personnel emphasize on the implementation of basic social value" and "marketing personnel emphasize on re-investment capability"; meanwhile, it might imply human task allocation imbalance and the need of improvement of resource application efficiency, or the hidden

over-confidence from the personnel or negligence of important indexes.

5.2 Discussion

In most previous literatures, IPA model and SWOT were compared, and such research methods were commonly seen, their focuses were mostly on the discussion of quadrant II (Threats), in the following, the expression on management meaning will be described [28] [29].

In quadrant II, strengthened improvement area (high importance, low performance), which represented (Threats), and such research result showed that "consumer emphasizes on energy saving and carbon reduction and green environment"(which was an items in the scope of consumption need), "actual economic, social and environmental interest was key knowledge factor of green building product"(which was an item in the scope of green knowledge), "marketing personnel emphasize on moral action meeting the social expectation"(which was an item in the scope of business concept), and all the above three items belonged to key factor indexes related to green product attributes, green consumption interest and corporate social responsibility promoted by supply end (house builder and dealer). This also showed that personnel in the ring of real estate sale generally thought that these indexes were quite important, however, the actual organization performance was not good (improvement was needed), and these were development threat factors of the suppliers due to "things were beyond their capability", therefore, in-depth management method should be used to solve it. After returning to literature summarization, some researches pointed out that: Sales personnel should quantify consumption need index to avoid random searching conducted by the consumer, and if the construction project was not promoted by targeting on target group, it will take less efforts to achieve the goal [15]; when the green consumption was accompanied with higher knowledge level (cognition level), green consumption attitude will be more positive, when the family had higher social economic position and richer experiences of environmental protection activity participation and environmental information contact, it will have

stronger green consumption behavioral intention [30]; in addition, it was found in some researches that significant positive correlation existed between green consumption attitude and green consumption behavioral intention [31] [32]; meanwhile, the promoting enterprises had gradually escaped from traditional concept based on creating economic profit as its only objective, in the modern enterprise operation environment, enterprise was urged to face many organized and active stakeholders and to do its social responsibility well [22].

Based on the above statement, no matter the supply end or consumption end of green building, both of them can recognize the great influence of the environment on people, therefore, they had the concept of environmental protection (expectation on real environmental interest and living quality), consequently, they were willing to change the sale and consumption form; meanwhile, they will tend to use more efficient (saving of energy and resource) and less polluted (reduction of environmental loading) thinking method for decision making, and green building product was one of such new and representative transaction models. Finally, in response to the statement earlier in this article, Feng-Yao Chen pointed out: Due to limited understanding from the consumer on the green building, among three perspectives such and environment, economy and society, the user preferred the social perspective green feature, and the supplier preferred to provide green feature of economic perspective, in other words, both of them had cognition difference on the preference of green feature, therefore, suggestion provided by the author of this article was that the supply end of green building product, in addition to strengthening on the announcement, could emphasize on the providing of green feature of social perspective, through constructive communication between both, the cognition difference between the supply end and demand end on green building could be clarified, and customer satisfaction could be enhanced, consequently, the difficulty faced by the supply end in management and maintaining aspect could be broken through [1].

5.3 Limit and suggestion

Since the target under test for this research was

based on the personnel of real estate sale organization in middle Taiwan, therefore, it was a self-evaluation at the internal side of the organization, and consequently, such conclusion was limited. First, it could easily fall into subjectivity or homogeneity; second, it cannot completely and truly reflect what belonged to the external environment scope of sale part, for example, the process and state of multi-side interaction among supervisory organization, technical team and consumer's group, therefore, it was suggested that in the subsequent research, the opinions of related parties (representative of government and official side, architect and targeting consumer group) can be included for more in-depth research, or maybe cross-section (comparison) or longitudinal section (trend) can be used for analysis so that such research result can be more exhaustive, and the strengthening of explanatory power of the overall IPA model can be acquired.

References:

[1] Feng-Yao Chen. (2017). Green building value – Cognition analysis of both supply and demand end. *Land Economics Annual Publication* (28), 106-132.

[2] Zou, Y., Zhao, W., & Zhong, R. (2017). The spatial distribution of green buildings in China: Regional imbalance, economic fundamentals, and policy incentives. *Applied Geography*, 88, 38-47.

[3] Chu-Kuang Hsieh, Wen Han Chou, Chu Yu Yang, & Wan Yu Lo. (2011). An empirical analysis for green building performance in affecting the real estate market effectiveness in Taiwan, *Hwa Kang Journal of Agriculture*; (Volume 26 (2011/01/01)), P71-99.

[4] Shu-Hui Lan, Ming-Yuan Hsieh, & Yuan-Hsiung Hsu. (2014). An evaluation of the influential factors of green building promotional strategy. *Journal of Architecture* (89), 195-209.

[5] Cole, R. J. (1999). Building environmental assessment methods: clarifying intentions. *Building Research & Information*, 27(4-5), 230-246.

[6] Architecture and Building Research Institute of the Ministry of Interior.(2017). Nine indexes for evaluating green building. Retrieved from http://www.abri.gov.tw/tw/mark/1

[7] Chao-Ming Cheng. (1993). Cognition psychology: Theory and practice. Taipei City: Eslite.

[8] Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: *An introduction to theory and research*.

[9] Chung-Hsin Yeh. (2011). Educational psychology: Psychological Press.

[10] Engel, J. F., & Roger, D. (1993). Blackwell, and Paul W. Miniard (1995). *Consumer behavior*, 6.

[11] Slideplayer.com.(2017). Engel-Blackwell-Kolla (EBK) Model. Retrieved from http://slideplayer.com/slide/2539333/9/images/7/EKB+MODEL.jpg

[12] Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive psychology*, 5(2), 207-232.

[13] Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.

[14] Hsee, C. K. (1996). Elastic justification: How unjustifiable factors influence judgments. *Organizational Behavior and Human Decision Processes*, 66(1), 122-129.

[15] Ching-Hsiang Wang, & Hsin-Hai Lu.(2014). A study using analytic hierarchy process to set up factors affecting the purchase of house by a consumer.

[16] Chia-Hui Wu, Yu-Cheng Li, & Yi-Fang Hsieh. (2013). Applying DEMATEL in the key evaluation factor analysis of the decision making of house purchase by a consumer. *Minghsin Journal*, 39(1), 141-152.

[17] Mei-Ling Chou, & Chin-E Chang. (2005). A study of influencing factors during the search period of house purchase. *Management Review*, 24(1), 133-150.

[18] Gilg, A., Barr, S., & Ford, N. (2005). Green consumption or sustainable lifestyles? *Identifying the sustainable consumer*. Futures, 37(6), 481-504.

[19] Ching-Yu Lien, & Yu-Shih Chen. (2010). A study of the correlation among consumer's

personal attribute, green consumption cognition and behavioral intention in the catering industry: Taking Taipei and Hsinchu area as example.

[20] Tsai-Mei Lin, & Keng-Ming Chuang. (2007). Peaceful culture operation concept and multi-national enterprise cross-cultural management performance –Take the business operation strategy of Japan's MNE as example. *Multinational enterprise management review*, 1(1), 1-38.

[21] Ta-Wei Huang, & Hui-Te Yen.(2014). Peaceful culture business concept and organization commitment. *Multinational enterprise management review*, 8(S), 69-87.

[22] Freeman, R. E. (1984). Strategic Management: A Stakeholder Approach (Boston: Pitman, 1984). Google Scholar.

[23] Chia-Chi Huang.(2000). Corporate social performance research – An empirical analysis of the correlation among social responsibility performance, corporate reputation and financial performance. *Asia Pacific Management Review*, 5(3), 367-380.

[24] Kuo Liang Tai. (2015). Integrated marketing communication: Omni-bearing theoretical architecture and localized practical case: Wu-Nan Book Inc.

[25] Schultz, D. E. (1992).Integrated marketing communications. *Journal of Promotion Management*, 1(1), 99-104.

[26] Duncan, T., & Moriarty, S. E. (1998). A communication-based marketing model for managing relationships. *The Journal of marketing*, 1-13.

[27] Martilla, J. A., & James, J. C. (1977).Importance-performance analysis. *The Journal of marketing*, 77-79.

[28] Li Chang Li, & Shu-Ching Lin. (2006). IPA analysis of zoo's visitors on educating marketing strategy cognition – Take Taipei Zoo as an example. *Journal of Leisure and Tourism Industry Research*, Sept. 2006, 1(1), 55-64.

[29] Huai-Chih Hsu, Ming-Jui Kao, & Ping-Yi Chao. (2011). The dilemma and challenge of non-profit organization enterprise: *Entrepreneurship. Management Research*

[30] Po-Wei Wang, Chen-Chen Huang, Hsiao-Lan Tang, Kuo-Liang Yeh, & Chih-Chien Tseng. (2009). A study of green consumption knowledge, attitude, behavioral intention and related factors of junior high school students in Taipei City~ Take certain junior high school as example. *Chinese Journal of Science Education*, number 3 of volume 17, 255-274.

[31] Chan, R. Y. (1999). Environmental attitudes and behavior of consumers in China: Survey findings and implications. *Journal of International Consumer Marketing*, 11(4), 25-52.

[32] Straughan, R. D., & Roberts, J. A. (1999). Environmental segmentation alternatives: a look at green consumer behavior in the new millennium. *Journal of consumer marketing*, 16(6), 558-575.