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ANALYSIS OF SERVICE QUALITY IN HOME DELIVERY COMPANY: AN EMPIRICAL STUDY IN TAIWAN

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ABSTRACT

The aim of this research focus on home delivery industry, applies quality function deployment (QFD) to systematically find out the service operation in terms of quality and technical aspects. We explore shipper's needs and analyze them by referring the literature and research. The five items are obtained: speed and reliability, freight, safety, personnel, service and convenience. Based on these items and by using QFD, shipper's needs on service quality will be transformed into technical requirements. Finally, the house of quality (HOQ) is used to construct the priority of executing feasible alternatives for improving the service of home delivery industry in Taiwan. The results of the research reveal that the following six items of service quality are urgently to be improved: employee's education, construction of overall transportation network, cultivation of related caliber, applying advanced IT, differentiated service.

Keywords: Home Delivery Industry, Quality Function Deployment, Service Quality

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1. INTROUCTION

The domestic logistics policy investigation published by Ministry of Land, Infrastructure and Tourism in 2011 suggests sophisticating the logistics network and service level to satisfy the increasing demand for advance infrastructure and urban transportation in Japan. Home delivery industry is a service offering delivery of products to shipper's house and a new way online shopping which customers receive their products without leaving home. Since the starting of the business with less than 200 million goods delivered in 1976, the average growth rate was about 20% and until 1991 the total volume of delivery goods handled is 1.1 billion. Until now 2011, the average volume of delivery goods is above 2 billion and the number is still growing with the expansion network of domestic air cargo and online shopping business according to the statistic report of small goods and parcels in Japan.

Also in Taiwan, the market demand of this business is also significantly growing recently. In order to enlarge market and face competition, how to create business niche and offer better service to take the challenge has become an important issue to survive in the competitive market. Many studies revealed that knowing what customer wants and delivering high quality service can help to improve business reputation, customer loyalty, customer satisfaction and eventually increase market share. Customer request is getting demanding, critical, complicated and somehow ambiguous, so service providers should not only make good use of their tangible or intangible resources to improve the internal operation performance as well as hear the voice of customer to achieve customer satisfaction.

Customer satisfaction is the key goal of quality studies and several methods contribute to improving its efficiency and sustainability. Among the various approaches, the quality function deployment (QFD) is one of the most unique and object-oriented tools in the quality control science. The QFD method is a prior assessment approach which assures customer satisfaction by improving manufacturing and service processes. Rather than classical quality assessment methods, the QFD approach concentrates on primary analysis of the features of the product.

Quality Function Deployment (QFD) was first developed by Yoji Akao in 1966 and was designed to assess the particulars of products based on customer inputs. The major tool of QFD is the House of Quality (HOQ) matrix which was first applied in the Kobe Shipyard of Mitsubishi Heavy Industries for improving a new building project of an oil tank ship. Yoji Akao recommended the use of QFD for the shipbuilding industry and later its popularity was enhanced among several industries. In 1975, the Japanese Society for Quality Control appointed the Computer Research Committee. The report of QFD practice among 80 Japanese firms was published through in a final report by this committee. The major motivation of the QFD method is based on the Japanese business perspective which is formed by the long-term competitiveness and the patient capital. While the short-termism and the impatient capital focus on instant premiums and turnover, the long-term competitiveness endeavors to improve customer

satisfaction in the long-run and it contributes to the risk aversion by securing the cash-flows. However, the long-term competitiveness is also constituted by relatively low income and the corporate governance has mental boundaries on the fiscal desire and on the business initiative.

The main practice of QFD is based on the technical classification of the product and on the improvement of the design by utilizing proper technical particulars. The final part of the QFD is the definition of technical objectives for the product by engineers or other related experts. On the other hand, customer satisfaction of the producer is usually ignored or assumed is only taken into consideration by experts on defining technical objectives. This part of the QFD is not figured in setting of the procedure. Therefore, QFD is relying on the customer satisfaction itself and does not consider its practice and feasibility in depth.

To explain and assess the quality of a home delivery service is not easy because of its intangibility, inseparability and heterogeneity. However, some empirical and theoretical studies have been completed to explore the service quality topics in related transportation and logistics industries. Peters et al. (1998) point out the finding of the investigation with Chief Executive Officers (CEOs) of 16 largest third-party logistics companies about the customer's outsourcing interest in Europe. The responses emphasize the important factors including geographical coverage, reasonable price, company size, service offerings, and variety of logistics service. The most important issues for industry are systems development costs, performance match, marketing strategies, and revenues accrued. Liang et al. (2006) explored four significant service items for freight forwarders. The four service items include process convenience and reaction ability, integrated service, transport ability, and price. Shams (2008) investigated quality management of top 500 firms as members of Logistics Association Australia with Pearson chi-square test. The study revealed the most important service quality component is on-time delivery, while the primary quality items to implement include change corporate culture and employee's training. Chou and Lu (2009) applied SEM (structural equation modeling) method to find out that service quality of home delivery industries in Taiwan positively related to customer loyalty and switching costs. This empirical study revealed that the order of customer's satisfaction service was delivery range, seldom parcel loss, invoice accuracy, prompt and reliable collection and on time delivery.

After combining the items of evaluating the service quality described in the above publications, considering the characteristics of home delivery industry and consulting with home delivery managers, expert academics in Taiwan, 22 service attributes were selected to measure the service quality of home delivery industries.

2. STRUCTURE OF HOQ

The procedure for constructing the house of quality for implementation of the

QFD can be built by the following steps:

1. Customer attributes (WHATs, CAs): Customer attributes information can be known through survey or direct questions to customers. The weight of customer attributes is to understand the rate of importance and satisfaction of each item.
2. Technical characteristics (HOWs, TCs): Technical characteristics are constructed according

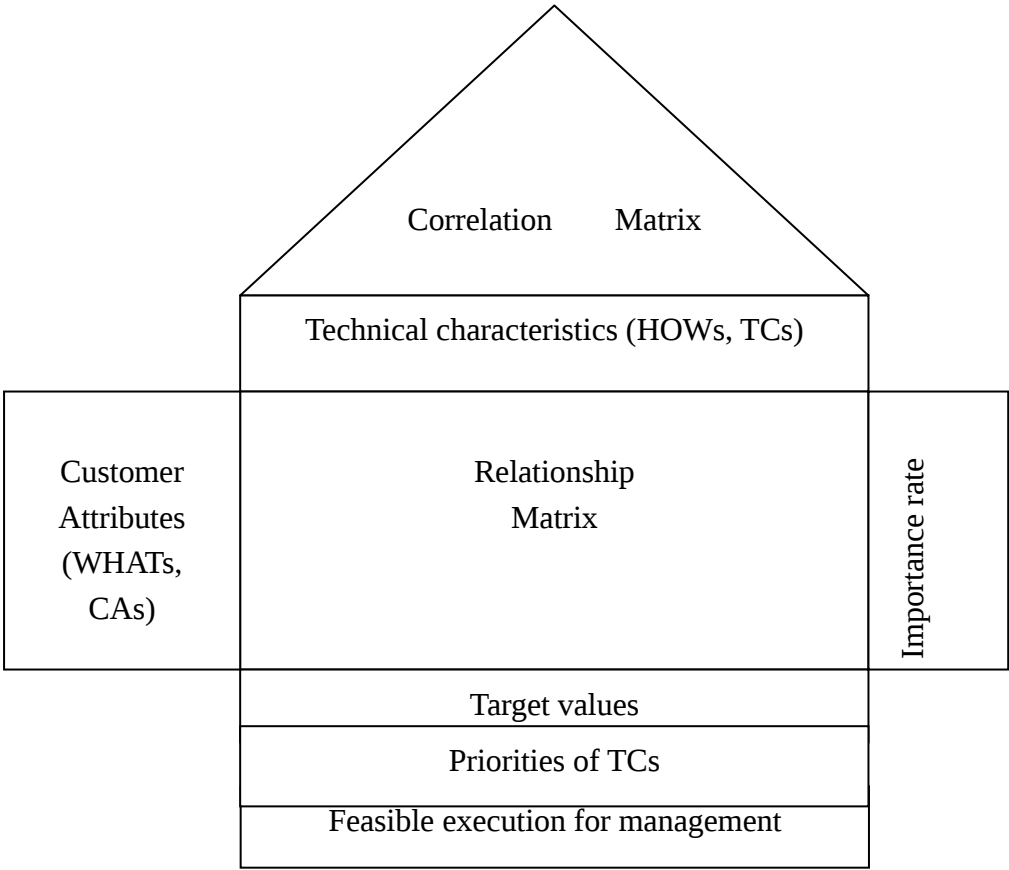


Figure 1 House of Quality

to a firm’s service or product based the firm’s resource and coordination. TCs are applicable for measuring a firm’s service or product.

3.Relationship Matrix: Combining each WHATs and HOWs, the relationship matrix shows the contribution level and relation of component characteristics to each customer attributes. As usual, signs represent four degree of strength (strong relationship, moderate relationship, low relationship, no relationship).

6.Development of Service Management Requirements

After reviewing the service quality needs of shippers and discussing with 3 academic experts and 3 professional home delivery executives, 12 service requirements are developed to improve the quality of home delivery service and to satisfy the shipper as Figure 2.

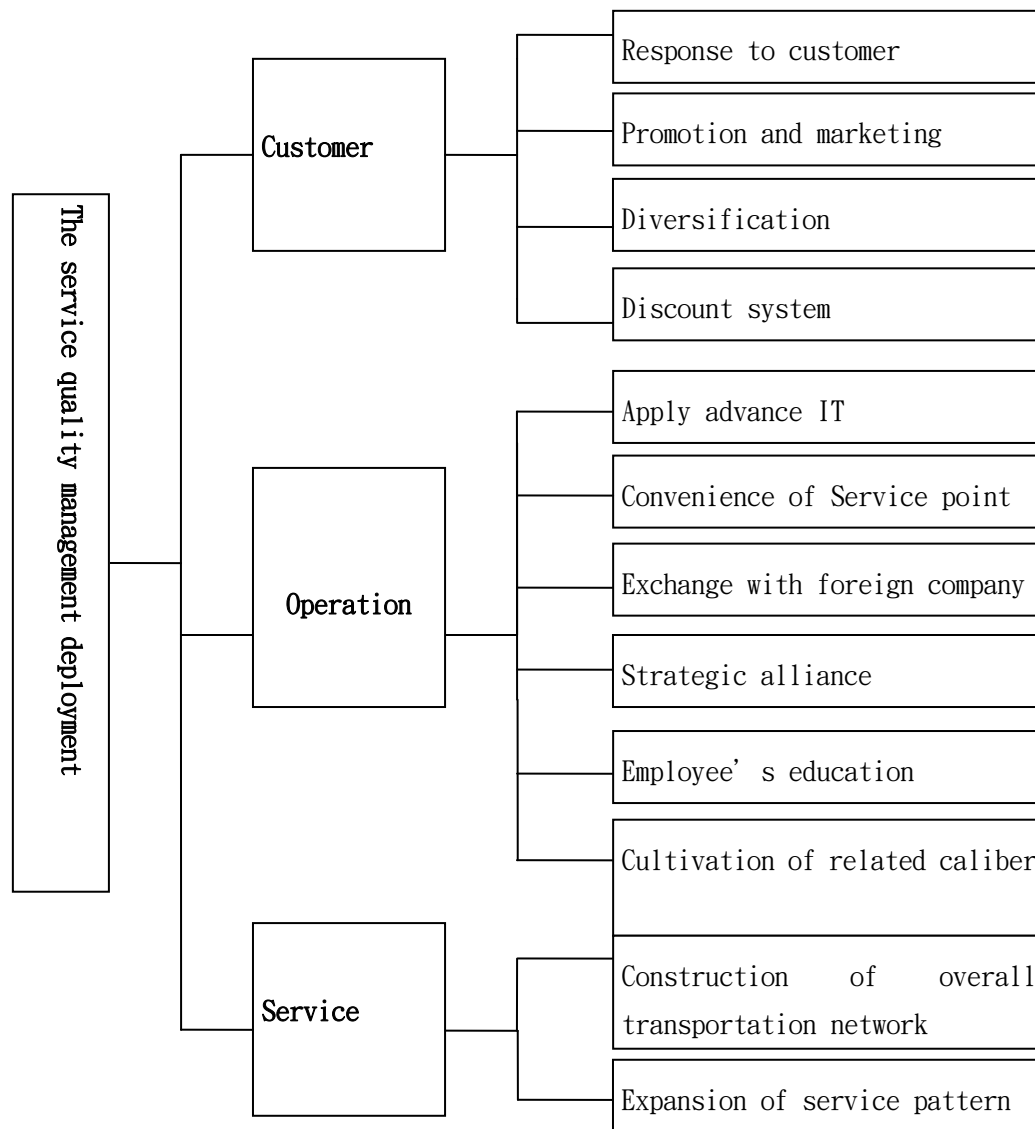


Figure 2 Service quality management deployment

3. AN EMPIRICAL STUDY

Selected 22 service attributes are used to design the questionnaire. Attitudes to each of the service attributes used in the questionnaire were assessed using a five-point Likert scale anchored. After the first draft of the questionnaire was designed, three academic experts, three professional home delivery experts and six shippers give their viewpoints on the questionnaire content. The questionnaire was revised after receiving their comments, finalized, and then 120 shippers were selected for the survey. The survey was carried out from October 2006 to March 2007. Among them, there were 18 invalid answers, and 102 usable responses.

Cronbach's α values were statistically determined to provide a summary measure of the inter-correlations that existed among a set of items. In this study, Cronbach's α values of all 22 service attributes with respect to importance and satisfaction degrees are all between 0.70~0.98. This shows that the questionnaire achieve a satisfactory

level of reliability in research.

The results of shippers' importance and satisfaction rating levels of service attributes based on questionnaire responses would be discussed as follows:

Table 1 The importance and satisfaction levels of shipper's service need attribute
 (importance) (satisfaction)

FACTOR	SERVICE ATTRIBUTE	Mean	Ranking	Mean	Ranking
Speed and reliability	Delivery speed	4.48	5	3.73	2
	Delivery in right place	4.76	1	3.96	1
	Delivery on time	4.62	2	3.64	3
	Transit time consistency	4.05	15	3.51	6
	Reaction when emergency	4.5	4	3.45	7
Freight	Freight rate charges	4.35	10	3.45	7
	Freight rate flexibility	4.05	15	3.38	15
	Clear tariff	4.37	8	3.44	8
Safety	Customer complaints handling	4.57	3	3.31	18
	Loss and damage record	3.88	19	3.29	19
	Compensation when damage	4.42	6	3.4	11
	Compensation system	4.21	13	3.39	14
Personnel	Shipper's need satisfaction	3.91	18	3.43	9
	Staff professional ability	3.97	17	3.37	16
	Staff appearance	3.79	21	3.39	13
	Staff attitude	3.84	20	3.43	10
Service and convenience	Convenience of receiving	4.38	7	3.52	5
	Convenience of payment	4.31	12	3.63	4
	Flexibility to customer need	4.36	9	3.64	3
	Providing urgent service	4.32	11	3.64	3
	Notice to shipper when delivery	3.99	16	3.36	17
	Cargo tracking system	4.07	14	3.4	12

After analyzing the questionnaire responses, we obtained the top five important service attributes as delivery in right place, delivery on time, customer complaint handling, reaction with emergency and delivery speed in Table 1. We also obtained five unsatisfactory service attributes as loss and damage record, customer complaint handling, notice to shipper when delivery, staff's professional ability and freight rate charges.

This reveals that the delivery speed and freight rate are very important factors to shippers. Designing the standard service processes to increase the speed and offering competitive tariff will improve shippers' satisfaction level.

Based on these factors and by using QFD, shipper's needs on service quality will be transformed into technical requirements of service quality. After interviewing with the experts and professional academic, the results and discussion of the research reveal that the following six items of service quality are urgently to be improved: employee's education , construction of overall transportation network, cultivation of related caliber,applying advanced IT, differentiated service. The analysis results are shown in Table 2, Table 3 and Table 4.

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Table 2 The result of HOQ

	Response to customer			Promotion and marketing			Diversification		Discount system			
Delivery speed	0.16	0.32	0.4	0	0	0	0.16	0.32	0.4	0	0	0
Delivery in right place	0.2	0.36	0.48	0	0	0	0.08	0.16	0.2	0.08	0.16	0.2
Delivery on time	0.22	0.42	0.54	0	0	0	0.08	0.16	0.2	0	0	0
Transit time consistency	0.16	0.32	0.4	0	0.04	0.12	0.08	0.16	0.2	0	0	0
Reaction when emergency	0.08	0.16	0.2	0	0	0	0.08	0.2	0.32	0.08	0.16	0.2
Freight rate charges	0.32	0.64	0.8	0	0	0	0.06	0.1	0.14	0.16	0.32	0.4
Freight rate flexibility	0	0	0	0.06	0.1	0.14	0.06	0.1	0.14	0.16	0.32	0.4
Clear tariff	0	0	0	0.06	0.1	0.14	0.08	0.16	0.2	0.08	0.16	0.2
Customer complaints handling	0	0.04	0.12	0.06	0.14	0.26	0	0	0	0	0	0
Loss and damage record	0.32	0.64	0.8	0	0	0	0.06	0.1	0.14	0	0	0
Compensation when damage	0	0	0	0	0	0	0.08	0.16	0.2	0	0	0
Compensation system	0.08	0.2	0.32	0	0	0	0.08	0.16	0.2	0.06	0.14	0.26
Shipper's need satisfaction	0.08	0.16	0.2	0	0	0	0.14	0.26	0.34	0.06	0.14	0.26
Staff professional ability	0.14	0.3	0.46	0	0	0	0.08	0.16	0.2	0	0	0
Staff appearance	0.06	0.1	0.14	0	0.04	0.12	0.08	0.16	0.2	0	0.08	0.24
Staff attitude	0.08	0.16	0.2	0	0	0	0.08	0.16	0.2	0.06	0.14	0.26
Convenience of receiving	0.14	0.26	0.34	0	0	0	0.08	0.16	0.2	0	0.04	0.12
Convenience of payment	0.08	0.2	0.32	0.08	0.16	0.2	0.2	0.36	0.48	0	0.04	0.12
Flexibility to customer need	0	0.04	0.12	0.08	0.16	0.2	0.06	0.1	0.14	0	0.08	0.24
Providing urgent service	0.08	0.2	0.32	0.08	0.16	0.2	0.14	0.26	0.34	0	0	0
Notice to shipper when delivery	0	0.04	0.12	0.08	0.16	0.2	0	0.04	0.12	0	0.04	0.12
Cargo tracking system	0	0	0	0	0	0	0.06	0.1	0.14	0	0	0
Weight of quality technology	0.09	0.19	0.27	0.03	0.06	0.08	0	0.08	0.16	0.21	0.03	0.08
Represent value		0.19			0.05			0.15			0.08	
Order of execution		3			12			6			11	

Table 3 The result of HoQ

	Apply advance IT		Convenience of service point				Exchange with foreign company			Strategic alliance		
Delivery speed	0.14	0.3	0.46	0.08	0.16	0.2	0.08	0.2	0.32	0.08	0.24	0.44
Delivery in right place	0.14	0.3	0.46	0.08	0.16	0.2	0.08	0.16	0.2	0.08	0.16	0.2
Delivery on time	0.2	0.36	0.48	0.08	0.16	0.2	0.08	0.16	0.2	0.08	0.16	0.2
Transit time consistency	0.08	0.16	0.2	0.08	0.16	0.2	0.08	0.2	0.32	0.08	0.16	0.2
Reaction when emergency	0.08	0.2	0.32	0	0.04	0.12	0.14	0.26	0.34	0.08	0.16	0.2
Freight rate charges	0.08	0.16	0.2	0	0	0	0.08	0.16	0.2	0.08	0.24	0.44
Freight rate flexibility	0	0	0	0	0.04	0.12	0.08	0.16	0.2	0.08	0.16	0.2
Clear tariff	0	0	0	0	0	0	0.06	0.1	0.14	0	0.04	0.12
Customer complaints handling	0	0	0	0	0	0	0.06	0.14	0.26	0	0	0
Loss and damage record	0	0.04	0.12	0	0	0	0.06	0.1	0.14	0	0	0
Compensation when damage	0.08	0.16	0.2	0	0	0	0.06	0.14	0.26	0	0	0
Compensation system	0.08	0.16	0.2	0	0	0	0	0	0	0	0	0
Shipper's need satisfaction	0.08	0.16	0.2	0	0	0	0	0	0	0	0	0
Staff professional ability	0.06	0.1	0.14	0	0.04	0.12	0.06	0.14	0.26	0	0	0
Staff appearance	0	0.04	0.12	0	0	0	0	0.08	0.24	0.06	0.1	0.14
Staff attitude	0	0	0	0	0	0	0	0.08	0.24	0	0	0
Convenience of receiving	0	0	0	0	0	0	0.08	0.16	0.2	0.06	0.14	0.26
Convenience of payment	0.08	0.2	0.32	0.32	0.64	0.8	0.08	0.16	0.2	0.06	0.1	0.14
Flexibility to customer need	0.08	0.24	0.44	0.16	0.32	0.4	0.14	0.26	0.34	0.06	0.14	0.26
Providing urgent service	0.06	0.1	0.14	0.24	0.48	0.6	0.14	0.26	0.34	0	0	0
Notice to shipper when delivery	0.08	0.16	0.2	0.08	0.16	0.2	0	0	0	0	0	0
Cargo tracking system	0.24	0.48	0.6	0.08	0.16	0.2	0	0	0	0.06	0.1	0.14
Weight of quality technology	0.08	0.17	0.24	0.06	0.12	0.16	0.06	0.13	0.2	0.04	0.09	0.13
Represent value		0.17			0.12			0.13			0.09	
Order of execution		5			9			8			10	

Table 4 The result of HOQ

	Employee's education			Cultivation of related caliber			Construction of overall transportation network			Expansion of service pattern		
Delivery speed	0.14	0.34	0.58	0.14	0.34	0.58	0.24	0.52	0.72	0.14	0.3	0.46
Delivery in right place	0.24	0.48	0.6	0.14	0.26	0.34	0.14	0.26	0.34	0.14	0.26	0.34
Delivery on time	0.26	0.46	0.62	0.08	0.16	0.2	0.3	0.58	0.74	0.08	0.2	0.32
Transit time consistency	0.08	0.16	0.2	0.08	0.2	0.32	0.2	0.36	0.48	0.08	0.16	0.2
Reaction when emergency	0.32	0.68	0.92	0.08	0.2	0.32	0.22	0.42	0.54	0.14	0.26	0.34
Freight rate charges	0.22	0.42	0.54	0.3	0.58	0.74	0.14	0.3	0.46	0.06	0.1	0.14
Freight rate flexibility	0	0	0	0.08	0.16	0.2	0.14	0.26	0.34	0.06	0.1	0.14
Clear tariff	0.08	0.16	0.2	0	0	0	0.14	0.26	0.34	0.06	0.14	0.26
Customer complaints handling	0	0	0	0	0	0	0	0	0	0	0.04	0.12
Loss and damage record	0.3	0.58	0.74	0.06	0.1	0.14	0	0.04	0.12	0	0	0
Compensation when damage	0.3	0.58	0.74	0.06	0.1	0.14	0	0	0	0.06	0.1	0.14
Compensation system	0.3	0.58	0.74	0.06	0.1	0.14	0	0	0	0	0	0
Shipper's need satisfaction	0.3	0.58	0.74	0.06	0.1	0.14	0.06	0.1	0.14	0	0	0
Staff professional ability	0.3	0.58	0.74	0.22	0.42	0.54	0	0	0	0	0.04	0.12
Staff appearance	0.3	0.58	0.74	0.22	0.42	0.54	0	0.04	0.12	0	0	0
Staff attitude	0.3	0.58	0.74	0.22	0.42	0.54	0	0	0	0.08	0.16	0.2
Convenience of receiving	0.22	0.42	0.54	0.3	0.58	0.74	0.08	0.2	0.32	0.14	0.3	0.46
Convenience of payment	0	0	0	0	0	0	0.06	0.1	0.14	0.06	0.1	0.14
Flexibility to customer need	0.06	0.1	0.14	0	0	0	0.14	0.3	0.46	0.22	0.42	0.54
Providing urgent service	0.06	0.1	0.14	0.06	0.1	0.14	0.26	0.46	0.62	0.12	0.2	0.28
Notice to shipper when delivery	0	0	0	0	0	0	0.14	0.26	0.34	0.06	0.1	0.14
Cargo tracking system	0.06	0.1	0.14	0.06	0.1	0.14	0.06	0.14	0.26	0.06	0.1	0.14
Weight of quality technology	0.17	0.34	0.45	0.09	0.17	0.24	0.21	0.1	0.21	0.29	0.07	0.14
Represent value		0.33			0.17			0.21			0.14	
Order of execution		1			4			2			7	

4. CONCLUSIONS

From the analysis results, some findings can be considered as the key point of strategy planning for home delivery company. First, employee and staff training should not only include uniform and appearance but professional ability and service etiquette. The staff plays the role as driver, receiver and fund collector, and is in the first line to serve the customer, so he should deliver not only cargo but also good image, attitude and enthusiasm to customers. Second, using IT to complete and strengthen interaction with customers will be the long term strategy for home delivery company. Third, construction of overall transportation network can provide high quality to customer such as route, delivery process, receiving point and tracking system. Moreover, the company could provide the scholarship or related seminar to cultivate the future experts and managers in this field. Finally, the diversification strategy provide the home delivery companies to differentiate themselves from post office service, express service and cargo service industries in Taiwan. It will raise the service quality and create value for shippers, and also improve customers' loyalty.

The comparison research of home delivery industry in East Asia such as Japan, Korea, China, Taiwan may be worth.

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