

Key Success Factor in Ready-Meal Suppliers Entering Convenience Stores

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ABSTRACT Convenience stores, providing consumers with convenient and instantaneous shopping in Taiwan, appear to be the highest density of outlets in the world. With the advantage of channels, convenience stores have changed the management strategies towards diverse development. Such platforms, attracting catering enterprises actively arranging for shelving, effectively create win-win between catering industry and retail stores. Nevertheless, there is little research on key success factors in such channels. This study therefore aims to discuss how ready-meal suppliers maintain the advantages of manufacturing and supply in catering markets to strive for cooperating with convenience stores and the key success factors in such a supply chain system. Based on literature review, experts on suppliers and convenience stores preceded in-depth interviews. Modified Delphi Method is utilized for organizing the expert group decision-making opinions to find out the suitable selection criteria. The questionnaire with five dimensions and 17 evaluation criteria is designed, which is further determined the relative weights with Analytic Hierarchy Process. Total 400 copies of questionnaires are distributed, and 284 valid ones are retrieved. The results show the weights of the five dimensions, in order, as Hygiene quality control ability (31.01%), Crisis management capabilities (26.51%), Compatibility with convenience stores (19.66%), Logistics and distribution capabilities (14.61%), and R and D capabilities (8.22%). Besides, the HACCP certificates, as the primary competitiveness of supplies, provide suppliers with the reference to examine self-capabilities and formulate competition strategies, which become the reference for convenience stores selecting suppliers.

1. INTRODUCTION

Taiwan is rapidly developed with the development of urbanization, the boom of industrial and commercial services, the changes of social styles, the increase of national income, the increase of single and female employees, and the changes in population structure. In the past five years, the total number of convenience stores and the revenue are stably growing (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Standard Industrial Classification of the Republic of China (Rev. 9) 2011) that they have approached ten thousand stores with the revenue over 0.23 trillion (Department of Statistics, Ministry of Economic Affairs 2012). The demands for convenience foods are increasing to match up modern life styles, such as time limit, fragmented diet, purchase speed, and cooking difficulty (Consumer Trend Report - Convenience 2010).

According to the statistics of Diet Habits of Eat-out Population Survey, the eat-out population for a meal a day has achieved 20 million

person-times, in which 80% are salary people, who even eat out for two meals a day. For this reason, convenience store enterprises target more diverse fresh foods. The market demands urge food processing and retail industry to form a global network, providing consumers with diverse and attractive convenient foods (Tillotson 2003). The past research focused more on products (Fang et al. 2003; Wadikar 2010; Martins and Germano 2011; Fatih 2011; Carini et al. 2013; Olsen et al. 2012) consumer intention (Fang et al. 2003; Olsen et al. 2010), or logistics (Lin 2002). This study therefore tends to explore the key factors in suppliers producing quality ready meals. With the popularity of convenience stores and the increasing consumers, ensuring the diet security and national health is also a key factor in convenience stores selecting suppliers. In this case, this study aims to discuss how ready-meal suppliers ensure the food security, maintain the market competitiveness, and strive for cooperating with convenience stores. The research results are organized the key success factors for follow-up research and practical applications.

2. LITERATURE REVIEW

2.1. Current Situation of Convenience Store Market

Convenience chain stores in Taiwan reached 9,854 with the total number of customers over 2.7 billion person-times and the total revenue more than 0.23 trillion NT dollars by 2011 (Department of Statistics, Ministry of Economic Affairs 2012). About one convenience store is open every 400 m in Taipei City, and the total number of stores in Taipei City and New Taipei City is about 35.5% of the total number in Taiwan (Fair Trade Commission, Executive Yuan 2012), revealing the fierce competition of convenience stores in metropolitan areas. The revenue of four major convenience chain stores, 7-Eleven, Family Mart, Hi-Life, and OK, is more than 80% of the total revenue, while 7-Eleven presents more than 60% among the four. The entire market environment therefore is affected by such four convenience stores; particularly, the business strategies of 7-Eleven have gradually become an important channel to satisfy customers' immediate food demands (Gottfredson 2005).

Eat-out population is about 70% of total population that the revenue is estimated more than 0.4 trillion per year (Department of Statistics, Ministry of Economic Affairs 2012). Fresh foods are the key item in convenience stores, and salary men and students are the major customers. Fresh foods, with short expiration date, refer to the products being immediately enjoyed, which are classified into 4°C for 3-7 days, 18°C for 1 day, 25°C for 3 days, and hot food, covering the items of (1) cold noodles, microwave soup, microwave instant food, microwave conditioning food, cakes, desserts, sweet soup, and salad at 4°C, (2) rice rolls, hand rolls, Sushi, sandwiches, and lunch boxes at 18°C, (3) sweet buns and toast at 25°C, and (4) hot foods (frozen for distribution and heated in stores) like tea eggs, Oden, Chinese steamed buns, steamed buns, hotdogs, and canned soup. Hi-Life first provides consumers with dining space in the stores, offers bread, coffee, and light meals aiming at different areas, and presents diverse store and space design.

2.2. Key Success Factor

Key success factor was first published in *Crisis in Management Information* by Daniel

(1961), who proposed that most enterprises would present 3-6 decisive factors; a company had to pay more attention to such key factors for the success. The applications to industries covered information technology (Rockart 1979), hospitality industry (Brotherton 2004), medical industry (Rosacker et al. 2010), small and medium enterprises (Psomas et al. 2010), and construction industry (Lu and Yuan 2010). According to Aaker (1984), key success factor was the most important competitiveness or asset for enterprises coping with the competitors. Key success factor was defined as that an enterprise had to master the trend for future development, make changes with industrial characteristics, market trend, competition conditions, and time change, and further acquire competitive advantages and promote the business performance for successful operation and sustainable management. In regard to the research on hospitality management, little research was done on box-meal factories and ready-meal suppliers. Particularly, suppliers with convenience stores being the channels reveal the essentiality on this study.

In such a competitive market, research on ready meal covers hygiene (Fang et al. 2003; Martins and Germano 2011), food safety regulation (Roberts and Unnevehr 2005), quality (Carini et al. 2013), health (Olsen et al. 2012), consumer intention (Olsen et al. 2010), analysis (Fatih 2011), and product development (Wadikar 2010). Food security has been a critical issue (Vanne 1996; Caswell et al. 1998; Wang et al. 2010) that Quality Control System, HACCP, and presently promoted Traceability System have attempted to promote the food security supply chain from farms to dining tables (Sperber 2005). Logistics and distribution capabilities, with stable temperatures and proper storage and distribution, are the key point in maintaining products.

3. RESEARCH METHOD AND PROCEDURE

3.1. Research Design and Questionnaire Sampling

Based on domestic and international literatures, purposive sampling is applied to selecting samples from the interested parties (research subjects) of ready-meal suppliers to convenience stores, storekeepers or supervisors of conve-

nience stores, and experts in the ready-meal field. The ready-meal suppliers to convenience stores include Ton Hoa Foods, President Chain Store Corp., Fast Food, and Pingtung County Farmers' Association as the cooperative suppliers of 7-ELEVEN, Family Mart, Hi-Life, and OK, respectively. With Modified Delphi Method to organize the expert group decision-making opinions, the primary questionnaire is completed, evaluated, and set the content for suitable selection criteria, and the evaluation dimensions in Hierarchy II and the evaluation criteria Hierarchy III are designed. The retrieved questionnaires are analyzed, determined the relative weights of criteria, and concluded the key success factors in ready-meal suppliers with AHP. Total 400 copies of questionnaires are distributed, and 284 copies are retrieved, with the retrieval rate 71%.

3.2. Modified Delphi Method

Modified Delphi Method, as experts' forecasting and group decision-making, is proceeded by the experts providing the professional competence, opinions, and experience, cohering with the common consensuses of issues, and filling in questionnaires through written forms or e-mails. The participants therefore could express the opinions, according to the professional literacy and self-cognition, in hidden environments. Delphi Method is regarded as an effective method to analyze complex problems, evaluate current situations, and enhance policy quality and enterprise transformation. Chiu (2001) proposed to modify traditional Delphi Method with similar practice and statistics, but replace the complicated open-ended questionnaire with a structural questionnaire referring to the research results and planning in the literatures or expert interviews, named Modified Delphi Method. It could save time, allow experts concentrating on the research topic, omit the guess at the open-ended questionnaire, and enhance the retrieval rate.

3.3. Analytic Hierarchy Process

Analytic Hierarchy Process could simplify complex problems into a concise hierarchic structure by collecting experts' decision-making opinions and quantify the elements after pair wise comparisons for a pair wise comparison matrix. It

aims to acquire the maximized eigenvalue and eigenvector of the matrix for the priority vector of a hierarchy standing for the priority among the elements for evaluating the appropriateness of the questionnaire by the consistency ratio and being the index for the evaluation with Analytic Hierarchy Process or the usability of decision-making information (Deng 1989; Saaty 2008).

3.4. Hierarchy and Questionnaire Design

The questionnaire is designed as the research topic in Hierarchy I, the chef's core competence and meal offering quality in Hierarchy II, and the evaluation criteria of the dimensions in Hierarchy III. The evaluation criteria in the three hierarchies acquired with AHP are explained as follows.

The research topic is established in Hierarchy I, as the purpose of evaluation (discussion of key success factors in ready-meal suppliers). Key success factors in the supply capability are considered in Hierarchy II, including the dimensions of R and D capabilities, Compatibility with convenience stores, Hygiene quality control ability, Logistics and distribution capabilities, and Crisis management capabilities. Such dimensions are discussed by experts and conform to the reliability consistency. Based on the dimensions in Hierarchy II, the evaluation criteria are developed in Hierarchy III, as below.

A. Three criteria are proposed for R and D capabilities, including

- a. Actively cultivating R and D talents
- b. Regularly evaluating the variety and success rate of new product development
- c. Establishing a reward system for R and D

B. Three criteria are proposed for compatibility with convenience stores, containing

- a. Providing quality and quantity products with the marketing of convenience stores
- b. Assigning dedicated personnel for convenience store affairs
- c. Providing special offers with the product promotion of convenience stores

C. Four criteria are proposed for hygiene quality control ability, covering

- a. Practicing hygiene management of personnel and equipment
- b. Practicing temperature control of products and disinfection of final product package
- c. Acquiring certificates like GMP, HACCP and ISO

- d. Presenting high qualification ratio of examined products from hygiene sectors
- D. Three criteria are proposed for Logistics and distribution capabilities, including
 - a. Logistic vehicles with complete temperature control
 - b. Distributing personnel familiar with distribution affairs and favorable service attitudes
 - c. Standard operation process for product delivery
- E. Four criteria are proposed for Crisis management capabilities, covering
 - a. Establishing anti-poisoning measures
 - b. Establishing a real-time detecting and recycle system for defective products
 - c. Establishing a real-time report and emergency response system for logistic channels
 - d. Establishing emergency response measures for public hygiene infection in the production

emphasized, followed by Crisis management capabilities and Compatibility with convenience stores, and Logistics and distribution capabilities and R and D capabilities the least.

Among the 17 evaluation criteria, Practicing hygiene management of personnel and equipment appears the best importance, followed by Providing quality and quantity products with the marketing of convenience stores, Presenting high qualification ratio of examined products from hygiene sectors, Establishing emergency response measures for public hygiene infection in the production, Establishing a real-time detecting and recycle system for defective products, Acquiring certificates like GMP, HACCP and ISO, Providing special offers with the product promotion of convenience stores, Standard operation process for product delivery, practicing temperature control of products and disinfection of final product package, and logistic vehicles with complete temperature control (Table 2).

4. RESULTS

4.1. Overall Analyses of Key Success Factors

Hierarchic weight, also named local priority, is the relative weight among the factors in a hierarchy. An overall weight, also named global priority, is the result of the weight in the previous hierarchy multiplied by the relative weight in order to present the weights of the factors in the hierarchy.

The consistency ratio (CR) of the overall hierarchy appears <0.1 , revealing the consistent opinions and acceptance. From Table 1, the retrieved questionnaire data are analyzed with AHP, where Hygiene quality control ability is mostly

5. DISCUSSION

5.1 Analyses of Dimensions in Hierarchy II among the Three Interested Parties

Horizontally comparing the dimensions in Hierarchy II among the three interested parties, experts consider Hygiene quality control ability the most important, followed by compatibility with convenience stores, crisis management capabilities, logistics and distribution capabilities, and R and D capabilities; suppliers regard compatibility with convenience stores the mostly important, followed by hygiene quality control ability, crisis management capabilities, logistics and distribution capabilities, and crisis management

Table 1: Matrix and weight of dimensions after pair wise comparison

<i>Dimension in hierarchy II</i>	<i>f 1</i>	<i>f 2</i>	<i>f 3</i>	<i>f 4</i>	<i>f 5</i>	<i>Hierarchic weight</i>	<i>Priority</i>
R and D capabilities (<i>f 1</i>)	1	0.5002	0.2638	0.4034	0.3635	0.08e	5
Compatibility with convenience stores (<i>f 2</i>)	1.9994	1	0.6405	1.4847	0.7954	0.2c	3
Hygiene quality control ability (<i>f 3</i>)	3.7904	1.5612	1	2.2461	1.1119	0.31a	1
Logistics and distribution capabilities (<i>f 4</i>)	2.4788	0.6735	0.4452	1	0.4608	0.15d	4
Crisis management capabilities (<i>f 5</i>)	2.7504	1.2571	0.8993	2.1697	1	0.27b	2
$\lambda_{\max} = 5.0444$ $CI = 0.0111$ $CR = 0.0099$							

*Alphabets in the hierarchic weight shows the significant variance between the data ($p < 0.05$)

Table 2: Analyses of the criteria

<i>Dimensions in hierarchy II</i>	<i>Hierarchic weight</i>	<i>Criteria in dimensions III</i>	<i>Hierarchic weight</i>	<i>Overall weight</i>	<i>Priority</i>
<i>R and D Capabilities</i>	0.08e*	D talents	0.17	0.014*	
		Regularly evaluating the variety and success rate of new product development	0.51	0.042	
<i>Compatibility with Convenience Stores</i>	0.2c	Establishing a reward system for R and D $\lambda_{\max} = 3.0082$ CI = 0.0041 CR = 0.0071	0.31	0.025	
		Providing quality and quantity products with the marketing of convenience stores	0.48	0.093	2
		Assigning dedicated personnel for convenience store affairs	0.18	0.034	
		Providing special offers with the product promotion of convenience stores $\lambda_{\max} = 3.0066$ CI = 0.0033 CR = 0.0057	0.35	0.068	7
<i>Hygiene Quality Control Ability</i>	0.31a	Practicing hygiene management of personnel and equipment	0.32	0.098	1
		Practicing temperature control of products and disinfection of final product package	0.17	0.052	9
		Acquiring certificates like GMP, HACCP and ISO	0.25	0.077	6
		Presenting high qualification ratio of examined products from hygiene sectors $\lambda_{\max} = 4.004$ CI = 0.0014 CR = 0.0015	0.26	0.081	3
<i>Logistics and Distribution Capabilities</i>	0.15d	Logistic vehicles with complete temperature control	0.34	0.049	10
		Distributing personnel familiar with distribution affairs and favorable service attitudes	0.21	0.03	
		Standard operation process for product delivery $\lambda_{\max} = 3.0355$ CI = 0.0177 CR = 0.0306	0.45	0.066	8
<i>Crisis Management Capabilities</i>	0.27b	Establishing anti-poisoning measures	0.13	0.033	
		Establishing a real-time detecting and recycle system for defective products	0.295	0.078	5
		Establishing a real-time report and emergency response system for logistic channels	0.28	0.073	7
		Establishing emergency response measures for public hygiene infection in the production $\lambda_{\max} = 4.0069$ CI = 0.0023 CR = 0.0026	0.301	0.079	4

CRH = 0.0077

*Alphabets in the hierarchic weight show the significant variance between the data ($p < 0.05$).

capabilities. From vertical comparisons, Hygiene quality control ability is mostly emphasized by experts and convenience stores, while suppliers stress on compatibility with convenience stores and hygiene quality control ability.

5.2 Analyses of the Criteria Comparisons among the Three Interested Parties

The three interested parties present different opinions on the top three criteria, which are not completely consistent.

Establishing a reward system for R and D and Presenting high qualification ratio of examined products from hygiene sectors are ranked in the middle, while actively cultivating R and D talents, assigning dedicated personnel for

convenience store affairs, standard operation process for product delivery, and establishing a real-time report and emergency response system for logistic channels are ranked behind. Based on the investigation reports of Department of Statistics, Ministry of Economic Affairs from 2012, current management situations of wholesale, retail, and catering industry do not reveal the short of professional talents. Besides, education is popular in Taiwan that actively cultivating R and D talents is ranked lower. The weights of assigning dedicated personnel for convenience store affairs, standard operation process for product delivery, and establishing a real-time report and emergency response system for logistic channels are lower, showing the standardized and automatic operation procedure

of convenience stores that the requirements are not high.

CONCLUSION

For the above discussion, the following are the conclusions in this study

1. Although "R and D capabilities" is not emphasized among the five dimensions, the hierarchic weight of convenience stores is 3.6 times higher than it of suppliers and experts, with remarkable variance ($p < 0.05$).
2. The hierarchic weight of suppliers and experts is higher than it of "convenience stores", with notable variance ($p < 0.05$), showing the strong channel brand in Taiwan.
3. All three interested parties stress on "Hygiene quality control ability".
4. The hierarchic weight of "Logistics and distribution capabilities" does not show significant variance among the three interested parties
5. The hierarchic weight of "crisis management capabilities" does not reveal notable variance among the three interested parties

RECOMMENDATIONS

As a consequence, the following suggestions are proposed in this study.

1. Suppliers therefore should actively cultivate R and D talents, regularly evaluate the variety and success rate of new product development, and establish a reward system for R and D.
2. Because of the competition, suppliers should actively provide quality and quantity products with the marketing of convenience stores, assign dedicated personnel for convenience store affairs, and provide special offers with the product promotion of convenience stores.
3. Practicing hygiene management of personnel and equipment, practicing temperature control of products and disinfection of final product package, and Acquiring certificates like GMP, HACCP and ISO are regarded as the key factors.
4. The three interested parties consider logistic vehicles should be with complete temperature control, distributing personnel should be familiar with distribution affairs and favorable service attitudes, and stan-

dard operation process should be established for product delivery.

5. The three interested parties consider anti-poisoning measures, a real-time detecting and recycle system for defective products, and emergency response measures for public hygiene infection in the production should be established.

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