Proceeding Paper

Investigation of Behavioral Sciences for Survival in the Food Industry during the COVID-19 Crisis [†]

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Abstract: The COVID-19 pandemic has dramatically impacted the beverage industry. It directly causes job losses, reduced income, and changes in customer preferences, and it influences the relationship between franchisors and franchisees. COVID-19 has spread rapidly around the world in the past two years. Meanwhile, the impact has reverberated from abroad to the headquarters of companies in Taiwan. Eight Taiwanese food and beverage brands saw steep drops in sales as the pandemic grew in severity. Thus, it is important to identify the critical elements of running a franchise store. Collected with Analytic Hierarchy Process (AHP) technology, the results show that the five key factors in franchises are going direct-to-consumer, establishing a B2B portal for distributors, assessing supply chain elastic limit, optimizing inventory, and streamlining e-commerce to meet changing customer needs. Guidelines and directions are provided for decision-makers through this study to design mobile applications in the simplest platform.

Keywords: franchisees; AHP technology; COVID-19; beverage industry

1. Introduction

Taiwan's unique food culture has developed the food service industry that never seems to hit its maximum capacity. According to research [1] on "Sales and Annual Growth Rate of Trade and Food Services" published in 2022 by the Department of Statistics, the Taiwanese food chain accounted for 7280 NTD in 2021. Over the past decade, Taiwanese foods, such as bubble tea and the XiaoLongBao (broth-filled steamed pork dumplings) of the Din Tai Fung restaurant chain and Gua Bao, have become world-renowned. How a food or beverage chain standardizes its management and production process is the key factor in deciding whether it is competitive. For instance, when more "human factors" are involved in preparing Chinese cuisine, it is difficult to set up a standardized process so that every branch offers the same food quality and taste. However, foreign franchisees must also overcome problems specific to the Chinese market. Franchisees in China often have difficulties finding local managers who can understand how to run a business. Previous research on customer expectations and perception in the food industry has shown valued attributes, e.g., service, location, image, brand name, low price, food quality (food tastes and nutrition properties), and value for money [2,3]. The early theorization of the nature of the franchise contract can be traced back to Rubin [4]. Falbe and Welsh [5] explained the impact of successes and failures by analyzing franchise executives' perceptions based on franchisors in Canada, Mexico, and the United States. Various approaches to franchisee issues are discussed in Refs. [6–8]. Chow et al. [9] presented a conceptual framework for linking quality and satisfaction in catering place operations. Cheng et al. [10] provided

insights into successfully implementing the international franchise system. Afni et al. [11] analyzed the development strategies and franchise-based business models of J.R. Tea Makassar. Studies [12,13] have stressed that resource scarcity, agency theory, risk spreading, and life cycle are fundamental for company ownership versus franchisee ownership. In terms of resource scarcity, franchising is presented as a means of rapid marketing. Scarce capital resources, managerial expertise, and knowledge of local markets are provided by franchisees. The related franchisees are classified into four major categories: license chain, franchise, voluntary chain, and cooperation chain. The limits of authority issues included unit franchise, multiple franchises, and regional franchise. In 1960, Penrose's theory offered a sounder theoretical basis for the resource-based view (R.B.V.). Wernerfelt [14] provided extensive discussions on the applications of R.B.V. Barney [15] examined the links among firms' resources, sustained competitive advantage-value, rareness, imitability, and substitutability. Many others, including Gallon et al. [16], Hunt [17], Ho and Tsai [18], and Lin et al. [19], have pointed out that the theoretical models of R.B.V. firm-based resources may be tangible (physical assets, e.g., financial resources and human resources, including cash, plants, machinery, real estate, and raw materials, etc.) or intangible (an organization's culture, reputation, know-how, accumulated experience, and relationships with customers, suppliers or key stakeholders). Lacking supplies needed to maintain life or a certain quality of life is resource scarcity. It is one of the basic ideas in the study of economics. Oxenfeldt and Kelly [20] proposed that firms should franchise access to scarce resources, particularly capital and managerial resources. Curran and Stanworth [21] explored the emergence and role of franchised economic activities at three levels: social, organizational, and motivational. Barney [15] examined the implications of this firm-resource model of sustained competitive advantage for other business disciplines. Several studies [22–24] have provided extensive discussions on the applications of resource scarcity. Resource dependency theory examines the relationship between external resources and organizational behavior. In the literature, this conflict has been analyzed within two quite disparate perspectives: agency theory and resource dependency theory. The authors provide an empirical assessment of various agency-theory explanations for capital to explain both franchisors' decisions about the terms of their contracts (royalty rates and up-front franchise fees). Lieberman and Montgomery [25] investigated the role of mechanisms conferring advantages and disadvantages on first-mover firms. Justis et al. [26], Mohr and Spekman [27], and Kumar et al. [28] described the fields of application in resource dependency theory. Rubin [4] observed that the nature of the franchise is examined using agency theory. Shane [29] proposed that hybrid organizational forms provide a way to overcome the agency problems of adverse selection and moral hazard in selecting, assimilating, and monitoring new managers. Eisenhardt [30] explained that agency theory is the behavior of a firm from the perspectives of various contracts between different parties. Many studies have interrogated this question: how can owners maximize the value of a franchise system before the sale process? [12,22]. Garg and Rasheed [31] examined several agency problems inherent in multi-unit franchising: bonding, adverse selection, information flow, shirking, inefficient risk-bearing, free-riding, and quasi-rent appropriation. Researchers have investigated the classification of stream research, especially franchising, by pointing out the contents and main contributions [32,33]. However, social exchange theory is based on a relationship created through a cost–benefit analysis between two people, especially a business-to-business relational exchange. Several studies have also investigated the impact of the franchisors' role performance and cultural sensitivity on franchisees' trust in and satisfaction with franchise partnerships [34,35]. When small-business owners differ in terms of motives to start a business, a key success factor is to help owners become responsible for managing the daily activities of an enterprise. Owning a business franchise offers an alternative to starting a business from scratch that appeals to many entrepreneurs.

In this study, marketing strategies in the service franchise industry such as tobacco and liquor stores, coffee chains, convenience store chains, language schools, restaurants, and beverage chains were investigated to show how the strategies affected the franchisor–

franchisee relationships. The structure of this research is described below. Section 1 provides a brief introduction to impact of COVID-19 in food industries. Section 2 describes the general design of methodology. Section 3 provides an example of data analysis and results. Section 4 results are then presented, with a thorough description of the case study. Finally results are discussed and conclusions are drawn.

2. Methodology

2.1. AHP Technology

The AHP is a mathematical tool for problem-solving to predict weighting items of a measurement scale. Table 1 shows a set of pairwise comparisons for each of the lower levels. The AHP consists of 5 primary steps to evaluate business performance in the food and beverage industry.

- Step 1: Identifying the decision, options, and criteria.
- Step 2: Constructing pairwise comparison matrices [36].

$$
A = \begin{bmatrix} 1 & A_{12} & \dots A_{1n} \\ 1/A_{12} & 1 & \dots A_{2n} \\ \vdots & \vdots & \cdots \vdots \\ 1/A_{1n} & 1/A_{2n} & \cdots 1 \end{bmatrix},
\tag{1}
$$

- In matrix A, all the diagonal elements are self-compared with survival strategies; thus $a_{ij} = 1$, where $i = j$, $i, j = 1, 2 \cdots, n$. Let $I a_{ij} = 1/a_{ji}$, where $a_{ij} > 0$, $i \neq j$;
- Step 3: Determining the important weight of each criterion. Let w_i represent the degree of importance of the ith attribute of store operations; then,

$$
w_i = \frac{1}{n} \sum_{j=1}^{n} \frac{a_{ij}}{\sum\limits_{i=1}^{n} a_{ij}} \quad i, j = 1, 2, \cdots, n,
\tag{2}
$$

$$
w_i = \frac{\left(\prod\limits_{j=1}^{n} a_{ij} \right)^{\frac{1}{n}}}{\sum\limits_{i=1}^{n} \left(\prod\limits_{j=1}^{n} a_{ij} \right)^{\frac{1}{n}}} \quad i, j = 1, 2, \cdots, n,
\tag{3}
$$

$$
w_i = \frac{\left(\frac{1}{\sum\limits_{i=1}^{n} a_{ij}} \right)}{\sum\limits_{j=1}^{n} \left(\frac{1}{\sum\limits_{i=1}^{n} a_{ij}} \right)} \quad i, j = 1, 2, \cdots, n,
\tag{4}
$$

$$
\lambda_{\max} = \frac{1}{n} \left(\frac{W_1}{W_2} + \frac{W_2}{W_2} + \cdots + \frac{W_n}{W_n} \right),
\tag{5}
$$

- Step 4: Achieving matrix consistency. According to Saaty, the consistency index is CR to measure the consistency ratio, which is expected to be less than 0.10. RI values can be calculated as matrices.

$$
C.I. = \frac{\lambda_{\max} - n}{n - 1} \begin{cases} = 0 \\ > 0.1, \\ \leq 0.1 \end{cases}
\tag{6}
$$

- Step 5: Identifying the best option by calculating utility functions.

If CR is greater than 0.1, the comparison matrix is not consistent. The comparison matrix needs revising in this situation, and consistency arrangements can be conducted [36].

Table 1. Strategies for minimizing the impacts of COVID-19 pandemic on the food and beverage industry.

Dimensions	Weight	Sub-Dimensions	Weight	Rank	Overall Weight	Overall Rank
Manpower	0.067	Personality traits	0.138	4	0.0135	16
		Before job training	0.232	3	0.0155	14
		On job training	0.246	2	0.016	13
		Management ability	0.384	1	0.025	10
Environment	0.143	Government subsidy	0.122	4	0.017	12
		Food festival	0.237	2	0.033	7
		Streamlining e-commerce to meet customer needs	0.461	1	0.065	5
Equipment	0.056	Competitor	0.180	3	0.0249	11
		POS data analysis	0.499	1	0.028	8
		Uber Eats/Foodpanda	0.272	2	0.015	15
		Store design	0.229	3	0.013	17
Product	0.379	Going direct-to-consumer	0.556	1	0.211	1
		Assessing supply chain resiliency	0.373	2	0.141	3
		Production packaging	0.071	3	0.027	9
Customer	0.355	Establishing a B2B customer portal for distribution networks	0.519	1	0.184	2
		Consumer group	0.137	3	0.049	6
		Optimizing inventory	0.344	2	0.122	4

2.2. Participants

Nineteen subjects including ten consultants and nine university professors were asked to complete a questionnaire that elicited information on their attitudes and professional knowledge of running a franchise store. The subjects, aged fifty to sixty years old, came from different provinces in China. For the present research, Figure 1 describes the framework for survival opportunities with five main evaluation dimensions: manpower, environment, equipment, product, and customer strategies related to beverage service to headquarters in Taiwan. The framework aims to test service quality and performance.
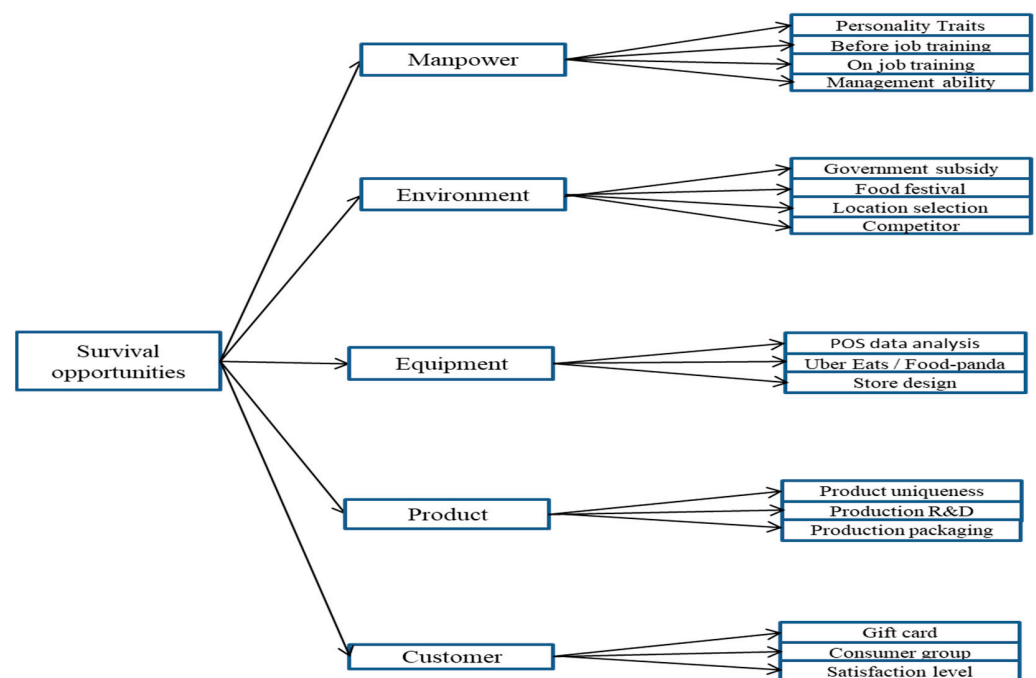
Figure 1. Impact of COVID-19 on plans to implement IT to reduce cost.

3. Data Analysis and Results

The data analysis for all small and medium-sized enterprises was conducted after two in-depth interviews averaging 2 h each. A two-phase study was designed to explore four critical success factors from the literature, and the experts judged these factors. The subjects indicated the level of agreement with each of the fundamental scales of (1) equal importance, (3) moderate importance, (5) essential or strong importance, (7) very strong importance, and (9) extreme importance. The fundamental scales of (2), (4), (6), and (8) showed intermediate values between the two adjacent judgments. Table 1 shows the result of the weight analysis of general indicators on the website in similar contexts.

The global rank of KFS was identified. The KFS summary table shows 15 behavioral indicators (Table 1): (1) a going direct-to-consumer, (2) establishing a B2B customer portal for distribution networks, (3) assessing supply chain resiliency, (4) optimizing inventory, (5) streamlining e-commerce to meet changing customer needs, (6) diversified transactions, (7) delivery time, (8) system accessibility, (9) market share, (10) browsing speeds, (11) return, (12) economize workforce, (13) maintenance, (14) website traffic, and (15) cost. Table 2 shows the results of the sub-dimensional analysis in the workforce within dimension weight. The sub-dimensions are management ability (38.4%), on-the-job training (24.6%), before-job training (23.2%,) and personality traits (13.8%). Further, the sub-dimensional environment was characterized by location selection (46.1%), food festival (23.7%), competitor (18%), and government subsidy (12.2%). Sub-dimensional equipment included POS data analysis (49.9%), Uber Eats/Food (27.2%), and store design (22.9%). The sub-dimensional products were product uniqueness (21.1%), production R&D (14.1%), and product packaging (2.7%). The sub-dimensions of customers were gift cards (51.9%), satisfaction level (12.2%), and consumer group (4.9%). Similarly, by comparing the attribute values of all the alternatives, they were ranked accordingly.

Table 2. Analysis of matrix and weight of product, customer, environment dimension, manpower, and equipment dimensions.

Dimensions	Sub-Dimensions		I_{11}	I_{12}	I_{13}	I_{14}	Weight	Rank
Manpower (CR = 0.014 < 0.1)	Management ability (I_{11})	I_{11}	1	7	1/6	5	0.384	1
	On-the-job training (I_{12})	I_{12}	1/7	1	8	4	0.246	2
	Before-job training (I_{13})	I_{13}	6	1/8	1	9	0.232	3
	Personality traits (I_{14})	I_{14}	1/5	1/4	1/9	1	0.138	4
			I_{21}	I_{22}	I_{23}	I_{24}	Weight	Rank
Environment (CR = 0.025 < 0.1)	Streamlining e-commerce to meet customer needs (I_{21})	I_{21}	1	1/6	1/8	5	0.461	1
	Food festival (I_{22})	I_{22}	6	1	1/7	1/8	0.237	2
	Competitor (I_{23})	I_{23}	8	7	1	7	0.180	3
	Government subsidy (I_{24})	I_{24}	1/5	8	1/7	1	0.122	4
			I_{31}	I_{32}	I_{33}		Weight	Rank
Equipment (CR = 0.021 < 0.1)	POS data analysis (I_{31})	I_{31}	1	9	7		0.499	1
	Uber Eats/Foodpanda (I_{32})	I_{32}	1/9	1	6		0.272	2
	Store design (I_{33})	I_{33}	1/7	1/6	1		0.229	3
			I_{41}	I_{42}	I_{43}		Weight	Rank
Product (CR = 0.031 < 0.1)	Going direct-to-consumer (I_{41})	I_{41}	1	6	9		0.211	1
	Assessing supply chain resiliency (I_{42})	I_{42}	1/6	1	8		0.141	2
	Production packaging (I_{43})	I_{43}	1/9	1/8	1		0.027	3
			I_{51}	I_{52}	I_{53}		Weight	Rank
Customer (CR = 0.034 < 0.1)	Establishing a B2B portal for distribution networks (I_{51})	I_{51}	1	5	8		0.519	1
	Optimizing inventory (I_{52})	I_{52}	1/5	1	7		0.122	2
	Consumer group (I_{53})	I_{53}	1/8	1/7	1		0.049	3

4. Case Study

In Chinese, "Gong cha" means offering superlative tea to the emperor from all possessions, symbolizing the highest quality and self-expectation in Taiwan. Gong cha has

become one of the world's most renowned quality tea providers. Nowadays, Gong cha has blossomed in over 20 regions worldwide, such as Korea, Japan, Hong Kong, Macau, Taiwan, Myanmar, Vietnam, Cambodia, and the Philippines. During the COVID-19 pandemic, customers stayed at home. However, social distancing did not stop them from going out to enjoy their favorite bubble tea combo. Alternatively, customers ordered their favorite fruit and milk tea through a food delivery service.

Although most of our stores were closed, several stores opened. As the COVID-19 crisis continued, many employers faced the difficulty of achieving significant cost reductions due to sudden revenue reduction. For the survival of beverage companies, the following were the top five success factors: going direct-to-consumers, establishing a B2B customer portal for the distribution network, assessing supply chain resiliency, optimizing inventory, and streamlining e-commerce to adapt to changing customer needs. During the crisis, the CEOs were forced to consider cost-saving plans, for example, free-cost placement, cloud computing, subscription service, and minimum maintenance charge. Figure 2 summarizes the cost-cutting strategy for Gong Cha during the COVID-19 period.
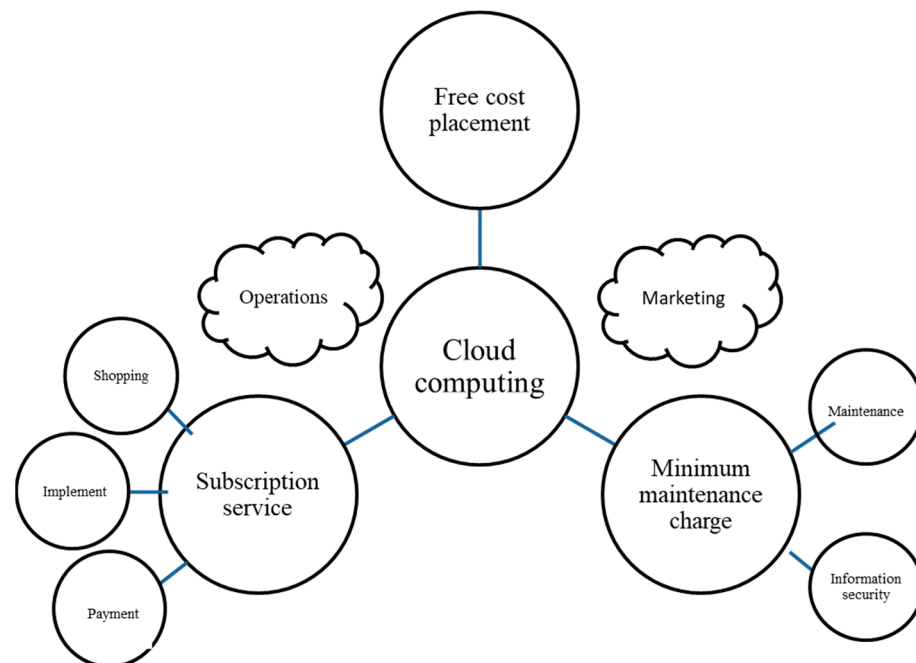
Figure 2. Framework for survival opportunities.

5. Conclusions

The Chinese economy is the world's second-largest in terms of GDP. Traditional business franchising, such as food and beverage (F and B) and retail, enters the Chinese market. Best practices for doing business in China have been established by major international franchises. For instance, without changing the core product, they localize their products when necessary. To achieve rapid expansion and mass acceptance, they are willing to minimize the price of the final product and the franchising fee. However, the COVID-19 outbreak impacted the franchising sector, with consequences for the business activities and integrity of the franchise system. Also, the COVID-19 crisis created complex challenges in the dynamic between franchisees and franchisors. The five major KFS for implementation were going direct-to-consumer (0.211), establishing a B2B customer portal for distribution networks (0.184), assessing supply chain resiliency (0.141), optimizing inventory (0.122), and streamlining e-commerce to meet changing customer needs (0.065). It implied that CEOs could provide made-to-order products to improve brand awareness during the COVID-19 period, paying for R&D costs associated with a new product/service. Gift cards can give cash-strapped franchises immediate cash flow.

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