

Ensuring the quality of e-shopping specialty foods through efficient logistics service

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The complementary effect produced by e-commerce integrated with home delivery service creates tremendous opportunities. These opportunities enable marketers to develop new services, allowing online shoppers to not only shorten their order cycle time but also allowing them multiple options to satisfy their shopping desires. Some studies have been performed to examine the issue of new service development

(NSD) in an emerging market, but research is lacking on the development of home delivery services (HDS) for specialty foods from traditional markets. This study analyzes a Taiwan's home delivery company and uses an NSD model and quality function deployment (QFD) to develop a home delivery service model. In the voice of customer (VOC) area, the results reveal that online shoppers emphasize the security of personal information and trading mechanisms of that information. As for HDS for specialty foods from traditional markets, online shoppers focus on the speed of the delivery service, the freshness of the foods and quick responses from HD companies when problems occur during delivery. Furthermore, in the voice of engineering (VOE) area, the main suggestions for improvement are training staff, setting up a brand, and strengthening system effectiveness and information safety.

Introduction

Home delivery service (HDS) has been considered to play a critical role in improving the convenience of online transactions and the physical distribution of goods (Hsu, Lin, & Chen, 2011). Many companies have accepted the belief that a better delivery process to customers can create sustainable competitiveness in the market. A consequence is that an increasing number of shippers now require fast, reliable, customized and cost-effective logistics processes and services (Persson & Virum, 2001). Furthermore, as indicated by Kamarainen, Saranen, and Holmstrom (2001), although home delivery is not a new service for the grocery business, the Internet helps to reintroduce old services. For example, the Internet enables consumers to rapidly and conveniently purchase various specialty foods from traditional markets instead of making purchases in person. Marketers for specialty foods from traditional markets are able to sell specialty foods to customers by using third-party logistics (3PL) companies after receiving orders. Thus, the establishment of the Internet has not only had an important impact on consumers' ordering processes, making it cheaper and faster and transcending time and geographical constraints, but has also had a significant impact on the business model of physical retail stores such as specialty foods from traditional markets.

As stated previously, the establishment of the Internet has created enormous potential business opportunities for e-commerce (Canavan, Henchion, O'Reilly, 2005). Ehmke and Mattfeld (2012) proposed that the ongoing

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success of online retail has promoted business models that utilize direct delivery to consumers' homes. More and more e-commerce businesses compete against each other for service quality (Ehmke & Mattfeld, 2012). However, the delivery process has not experienced similar efficiency improvements, and we realize that both efficient and reliable logistics are very important factors in the economic success of online stores. Thus, the effective management of service delivery is vital to the improvement of organizational performance (Samson & Terziovski, 1999; Zhao & Di Benedetto, 2013). More and more companies use service quality ratings as indicators of both service performance and a company's future because a high level of service quality corresponds to a high level of customer satisfaction and customer loyalty. In addition, prior studies have demonstrated that higher perceived service quality results in higher profitability levels (e.g., Chang & Chen, 1998; Cronin & Taylor, 1992; Silvestro & Cross, 2000). Consequently, following these previous studies, customers' perception of service quality should be studied in depth.

Measuring service quality is difficult because of the unique characteristics of intangibility, heterogeneity, inseparability and perishability (Buttle, 1996). The SERVQUAL model developed by Parasuraman, Zeithaml, and Berry (1985) is the most widely used measurement of perceived service quality. Tan and Pawitra (2001) also indicated that SERVQUAL model is a diagnostic technique, which can uncover strengths and weaknesses in broad areas of a business's service quality. The SERVQUAL model has five central dimensions (i.e., Reliability, Assurance, Tangibles, Empathy and Responsiveness) to measure service quality (Parasuraman, Zeithaml, & Berry, 1988; Zeithaml, Parasuraman, & Berry, 1990). This model, which used 22-item scale, focuses on the differences between consumers' perceptions of the service and their expectations for that service (Parasuraman et al., 1988). The differences between customers' perceptions and expectations affect their evaluation toward the quality of service (Pakdil & Aydin, 2007). Additionally, Zeithaml et al. (1990) mentioned that correctly understanding what customers expect is the most important step in defining and delivering high-quality service. As in other areas, whether or not management can accurately perceive what customers want and expect is one of the important issues in the home delivery sector. O'Connor, Trinh, and Shewchuk (2000) proposed that the expectation is the main determinant of consumer's service quality evaluation and satisfaction. At this point, the 'voice of the customer' should be taken into the service design process (Pakdil & Aydin, 2007). Tan and Pawitra (2001) have used the SERVQUAL model to obtain the voice of the customers. Using the same way of Tan and Pawitra (2001), this study also used the SERVQUAL model to investigate customers' expectations for HDSs (i.e., the voice of the customers). Moreover, with the development of e-commerce, physical businesses are also connected to

a website to provide various convenient services. Specifically, the website is seen as a key platform for services that an organization provides for its customers who use the Internet as a means of communication. Benaroch and Appari (2011) also indicated that e-service quality is important for differentiating among e-commerce providers and obtaining competitive advantage. Thus, customers' perception of e-service quality should also be studied in detail.

In summary, this study aims to fill the research gaps by (i) identifying customer needs for HDS and e-shopping services, and (ii) developing a home delivery service model for specialty foods from traditional markets. No studies have yet examined the underlying food-related service needs of individual consumers with respect to e-shopping for specialty foods. Hence, this study, which draws on the food-related service quality scale for HD and e-shopping, seeks to empirically establish a new service model for HD companies.

The rest of the paper is organized as follows: First, the extant literature is reviewed and the relevant criteria are identified to evaluate the service quality of home delivery and e-shopping. These criteria are sorted into the five dimensions of SERVQUAL and e-SERVQUAL, drawn from prior studies on the home delivery industry and e-shopping. The methodology applied in identifying customer needs and establishing a new service quality model is then illustrated, followed by the research results. Finally, the major research findings are discussed and research limitations and future research directions are highlighted.

Literature review

Home delivery

The home delivery (HD) industry has been viewed as a crucial component of extended supply chains that are designed to build stronger relationships with customers (Boyer, Hult, & Frohlich, 2003). The term "home delivery" represents all goods that are consigned to customers' homes or another designated site by customers rather than situations where customers have to personally pick up the goods or ship them in person. There are reasons for the rapid growth of HDS. First, sellers can offer further services to customers, such as a stockout, and HDS allows customers to avoid making another visit to stores. Second, the size or weight of goods often makes them difficult for customers to carry by themselves. Third, more and more customers utilize the Internet and TV shopping. Thus, customers are able to receive ordered goods *via* HDS from sellers' warehouses or joint service providers through third-party logistics (3PLs). As described previously, the need for HDS is increasing, and HDS is a value-added service provided by sellers.

Home delivery (HD) or door-to-door service could develop into a primary customized type of logistics service. HD is considered a vital component (Kuraishi, 2000), particularly in the area of e-commerce (Liao, Chen, &

Lin, 2011; Punakivi & Saranen, 2001). From the e-commerce viewpoint, HD is the “logistics element of the fulfillment process within consumer e-commerce transactions, other remote purchases from mail order, direct selling and television and shopping companies and deliveries from retail outlets” (Allen, Thorne, & Browne, 2007). Specifically, the emergence of TV and Internet shopping enables customers to order goods from the Internet or by telephone or fax. The need for HDS is increasing, and HDS can add great value to enterprises. Customers are able to receive ordered goods *via* HDS from sellers’ warehouses or cooperative third-party logistics service providers to homes or assigned locations. To enable efficient and convenient transactions, HDS providers should increase their value-added services. In practice, HD can satisfy various customers’ needs through customized services. During the shopping process, service quality issues are especially important to enterprises. Thus, an effectively coordinated logistics service with marketing can help a firm gain an advantage over competitors (Kahn & Mentzer, 1996; Mentzer & Williams, 2001). In other words, the functionality of home delivery is important for online shopping business models and is a crucial factor in their economic success (Ehmke & Mattfeld, 2012).

Specialty foods

Defining specialty goods is difficult because there has been no consistent definition in the literature, and it is further complicated by the different definitions of specialty goods by firms and other for-profit organizations (Liang & Lim, 2011). Liang and Lim (2011) proposed that specialty foods have three basic characteristics: premium price, quality and limited distribution products. Other important characteristics that seem frequently comprise production methods, supply chains and symbolism (Wycherley, McCarthy, & Cowan, 2008). The definition of specialty goods in Murphy, Meehan, O’Reilly, and Bogue (2002) presents the best combination of these characteristics, and thus was selected for use in this study. Murphy *et al.* (2002) defined specialty goods as “*products outside the mainstream possessing specific qualities, which differentiate them from standard foods*”. These qualities are derived from a combination of at least two of the following features: (1) Exclusiveness: the product is produced on a small scale and is therefore only available in limited quantities; (2) Processing: the product has at least undergone primary processing using non-industrial artisan techniques; (3) Distinctiveness: the distinctiveness of the product arises from a combination of all or some of the following attributes: extraordinary packaging, premium price, renowned origin, and/or its unique design”. Furthermore, as defined by the National Association for the Specialty Food Trade (NASFT), specialty foods are “*smaller production items that tend to be of higher quality ingredients than traditional, mass-market foods*”. Ilbery and Kneafsey (2000) indicated that quality in relation to specialty foods is

defined by making reference to other socially constructed and value-laden concepts such as “authentic”, “healthy” and “traditional”. Datamonitor (2005) showed that the success of the specialty food product market relies on uniqueness, support for local producers and unusual or interesting flavors. In addition, Wycherley *et al.* (2008) indicated that consumers purchase specialty foods they feel they can trust and easily trace due to food scares, fears of mass production and concerns about the environment. The authors also noted that the availability of specialty foods is vital because specialty foods often suffer from poor distribution channels and have limited availability. However, available points of purchase for specialty foods are increasing; they are now available not only in specialty stores but also in supermarkets, at farmers’ markets and on the Internet. The improved availability of specialty foods in more outlets is facilitating the drive to this sector.

Service quality

Service quality has been identified as a significant criterion for customers in choosing and evaluating their service providers (Mentzer, Gomes, & Krapfel, 1989). Hence, businesses have considered service quality to be a major means of differentiation and a powerful competitive weapon because excellent service quality enables a business to attract new customers and to encourage repeat purchases by existing customers (Berry, Parasuraman, & Zeithaml, 1988). Service quality is a measure of how well the service delivery meets customer expectations (Parasuraman *et al.*, 1985). Specifically, a customer’s evaluation of overall service quality depends on the gap between the expectations and the perceptions of the actual performance levels. In the services marketing literature, perceptions are defined as ‘consumers’ beliefs about the service received (Parasuraman *et al.*, 1985) or experienced service (Brown & Swartz, 1989). Expectations are defined as ‘desires or wants of consumers, i.e., what they feel a service provider should offer rather than would offer’ (Parasuraman *et al.*, 1988). Parasuraman *et al.* (1985) proposed a conceptual model of service quality. Subsequently, those authors developed a service quality measurement instrument (SERVQUAL) to measure customers’ expectations and their perceptions of actually experienced services (Parasuraman *et al.*, 1988). Of the SERVQUAL factors considered, five dimensions (Reliability, Assurance, Tangibles, Empathy and Responsiveness) measured using a 22-item scale were found to be of the most importance to customers. SERVQUAL is regarded as a leading measurement instrument of service quality (Karatepe, Yavas, & Babakus, 2005). Although previous studies (e.g., Cui, Lewis, & Park, 2003; Jain & Gupta, 2004; Mukherjee & Nath, 2005) have the debate of whether SERVQUAL or SERVPERF should be applied for measuring service quality, Carrillat, Jaramillo, and Mulki (2007) have showed that SERVQUAL and SERVPERF are equally valid predictors of overall service quality. Additionally, Carrillat *et al.* (2007) manifested

that adapting the SERVQUAL scale to the measurement context improves its predictive validity; conversely, the predictive validity of SERVPERF is not improved by context adjustments. Furthermore, in terms of validity and reliability, Robledo (2001) revealed that the SERVPERF is not an efficient measurement scale. Then, Carrillat *et al.* (2007) indicated that the SERVQUAL scale would have greater interest for practitioners owing to its richer diagnostic value. By comparing customer expectations of service with perceived service across dimensions, managers can identify service shortfalls and use this information to allocate resources to improve service quality (Parasuraman, Zeithaml, & Berry, 1994). Thus, the SERVQUAL scale constitutes a crucial landmark in the service quality literature and has been successfully applied in a wide variety of traditional service settings including home delivery services, e-shopping, insurance services, library services, information systems, healthcare settings, bank services, hotel services, and dental clinic services. Nevertheless, researchers need to adapt the measure to the context of the study when SERVQUAL is used (Carrillat *et al.*, 2007). Specifically, practitioners using SERVQUAL for overall service quality diagnostic purposes need to spend greater effort in modifying the scale for context.

In recent years, with the rapid development of Internet technology, the popularity and use of e-commerce has rapidly increased. In the e-commerce context, electronic marketing activities have attracted much attention because of the rapid growth of the business-to-customer online market. However, online service quality has a significant impact on the ability to gain a competitive advantage in the extremely competitive e-commerce environment. Numerous prior studies (e.g., Fassnacht & Koese, 2006; Holloway & Beatty, 2003; Lee & Wu, 2011; Santos, 2003; Wolfenbarger & Gilly, 2003) have viewed e-service quality as the vital determinant of long-term performance and success for e-retailers. Parasuraman, Zeithaml, and Malhotra (2005) defined e-service quality as “the extent to which a website facilitates efficient and effective shopping, purchasing and delivery”. Numerous studies have confirmed that higher perceived customer service lead to higher profitability levels (e.g., Hoffman, Novak, & Chatterjee, 1995; Lohse & Spiller, 1999; Xia *et al.*, 2003). However, despite the importance of perceived quality, most relevant studies (e.g., Bernardo, Marimon, & Alonso-Almeida, 2012; Mandel & Johnson, 1999; Menon & Kahn, 1997) emphasize aspects of website design. Thus, it is necessary to fill the gap in the literature by investigating which aspects of website services – beyond website design – determine customers’ perceptions of quality (Cristobal, Flavián, & Guinalú, 2007).

Quality function deployment

Quality function deployment (QFD) has been applied to help businesses recognize and meet customers’ needs within their abilities and resources (Liang, Chou, & Kan,

2006; Wang & Shih, 2013). QFD facilitates a business in making key trade-offs between what customers want and what a company can afford to build (Matzler & Hinterhuber, 1998). QFD is customer-driven and transforms customer needs into the appropriate technical requirements for products and services (Buyukozkan & Cifci, 2012). This process of transformation is referred to as the “voice of the customer” (VOC). Designers need a way to integrate customer requirements into designs (Chou, 2004; Li & Hsu, 1996). Fig. 1 shows the “House of Quality” and its components. The framework of the House of Quality illustrates how QFD can be applied. The left wall of the house includes a listing of customer requirements, while the roof lists the technical requirements or the “voice of engineering” (VOE).

However, applications of QFD are seldom found in the service field (Jeong & Oh, 1998). For instance, Jeong and Oh (1998) used QFD to investigate the lodging industry to integrate market demands into internal research and development activities. Chou (2004) applied QFD techniques to evaluate the quality of service in undergraduate nursing education in Taiwan from the perspective of nursing students. Wang (2007) employed QFD to integrate inside quality technology and the voice of consumers and illustrated a company’s performance in terms of service and by offering suggestions for improvement. Kuo, Wu, Hsu, and Chen (2011) reconstructed an integrated QFD model that will not only reduce costs but also find important outpatient service items that could improve the quality of medical care for elderly people. Additionally, Chen and Chou (2011) used QFD to identify service-improvement

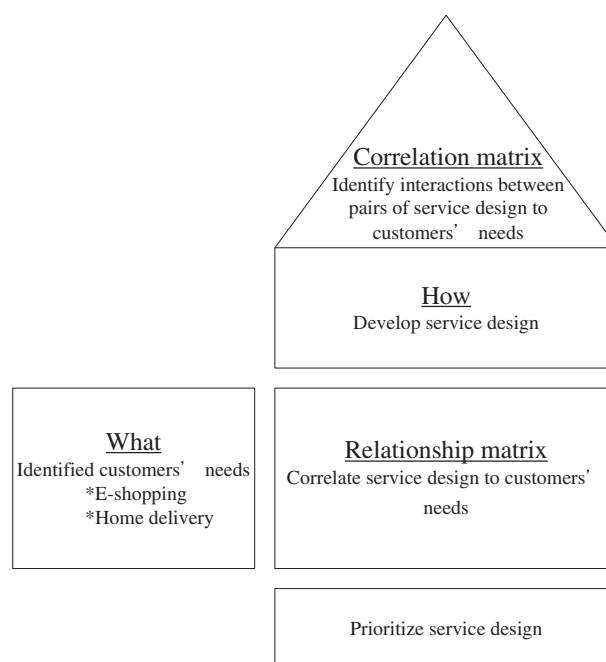


Fig. 1. Research framework – the House of Quality.

techniques for an academic library. Furthermore, Wu and Lin (2012) found that QFD can be used to help e-learning service providers identify the technical requirements they can use to enhance service quality. However, almost no studies have confirmed the applicability of QFD for HDS of specialty foods from traditional markets.

New service development

Because of intense competition, many companies have aimed to develop new services. New service development (NSD) is becoming increasingly important for companies that desire to increase a competitive advantage in service-driven markets. NSD has become a crucial competitive concern in many companies (Fitzsimmons & Fitzsimmons, 2000; Johnson, Menor, Chase, & Roth, 2000; Mansury & Love, 2008). NSD represents an overall process of developing new services from idea generation to market launch. Johnson *et al.* (2000) defined a new service as “an offering not previously available to customers that stems from the addition of offerings, radical changes in the service delivery process, or incremental changes to current service packages that customers perceive as being new”. Furthermore, Tsai, Verma, and Schmidt (2008, pp. 495–526) defined a company’s new service as “a new business practice or offering that differs from any existing alternatives provided by the same company”. Some researchers (e.g., Edgett & Jones, 1991; Hart & Service, 1993) have emphasized that the successful development of a new service requires changing the organization itself, such as the establishment of a new department or the restructuring of a distribution network. Hart and Service (1993) proposed that the creation of an efficient NSD required a functional integrative perspective, including setting up a less formal organization, increasing communication, and sharing information and decision making.

NSD has become an increasingly important concern in service industries (Jaw, Lo, & Lin, 2010). For example, Weerawardena and McColl-Kennedy (2002) argued that entrepreneurial intensity, distinctive learning capabilities and NSD comprise key components of a model that examines the role of NSD in gaining a sustained competitive advantage for service firms. In addition, in conjunction with the NSD framework, Jaw *et al.* (2010) provided empirical evidence to understand how service characteristics relate to innovation efforts that commit time and resources and require the encouragement employee efforts. Specifically, the authors found that the characteristics of heterogeneity, perishability and innovation efforts are important determinants for superior NSD in service industries. However, almost no studies have applied the NSD framework to HDS of specialty foods from traditional markets. Additionally, due to rapid developments in information technology and changing customer needs and preferences, we believe the effective design and development of services that connect goods will become increasingly important in the coming years.

Research methodology

Pretest

This study included a pretest to show the validity and reliability of the respondents’ survey in Taiwan, in which respondents have experience in purchasing specialty food products online, and whose ages range from 18 to 35 ($N = 50$). They were asked to report any difficulties they have encountered in the survey (e.g., ambiguous questions or terms), and to state their opinion to the survey overall. Feedback and information from the pretest were used to develop a final survey questionnaire. Finally, based on the pretest results, academics and experienced practitioners in the field reviewed and modified the wording of items.

Sample and data collection

The questionnaire collection ran continuously for the one-week survey period. A web-based survey was advertised on an electronic news website that was used to target commercial website users. Tan and Teo (2000) have suggested that online surveys have some advantages over traditional paper-based surveys, including lower costs, rapid responses and a lack of geographical limitations. The primary units of analysis in our study were customers who have experience purchasing specified food products online. To increase the number of effective responses, we also placed an advertisement to indicate that gifts will be offered to the respondents who answer all the questions as a token of gratitude. After removal of duplicate responses, a total of 270 usable responses were included in the sample for analysis. The sample characteristics are summarized as follows. Most of the respondents of customers are female (83.3%), single (57.4%), 26–35 (40.4%) age group, had at least the college degree (73.3%), and are unemployment (e.g., student, retired, housewife) (45.6%) and monthly income (NT\$) is under 20,000 (38.5%). We utilize the extrapolation technique equating late responses to non-respondents (Armstrong & Overton, 1977) to test the non-response bias. This study finds that there are no significant differences between respondents in the sample, or between early and late respondents. Specifically, no significant differences were identified at $p < 0.05$ leading the researchers to conclude that respondents are not different from non-respondents.

Development of instruments

The research method applied in our study is a web-based questionnaire survey. The questionnaire includes three parts. The first part has demographic questions about the respondents. The second part contains 16 items to assess the expectations of a customer when buying specified food products from a traditional market; this part of the questionnaire includes the five dimensions of reliability, assurance, tangibles, empathy, and responsiveness that were adapted from Stiakakis and Georgiadis (2009). Specifically, reliability was measured using three items,

that is, 'When you visit this website, the information related to specialty foods from traditional markets is consistent with the delivered product', 'This website can accurately provide transaction information and order processing', and 'The e-stores and their specialty foods in this website are reliable. Assurance was measured using three items, that is, 'It is safe to conduct transactions on this website', 'This website protects customers' information rather than arbitrarily sharing it with others', and 'The prices of the specialty foods on this website are reasonable'. Tangibles was measured using four items, that is, 'This website provides up-to-date information', 'This website is visually appealing', 'This website is convenient to access', and 'Linking to the e-shopping site and the mutual linkage of web pages are fast'. Empathy was measured using three items, that is, 'This website has many promotional activities', 'This website provides premiums to loyal customers', and 'This website provides various payment channels'. Responsiveness was measured using three items, that is, 'This website contains enough information to rapidly respond to the questions proposed by customers', 'The staff's attitudes on this website are kind', and 'This website provides returns and exchanges of goods when you shop online'. The final part has 13 items to evaluate the expectations of a customer for home delivery services, which includes the five dimensions of reliability, assurance, tangibles, empathy, and responsiveness that were adapted from Hsu, Chen, Chang, and Chao (2010). Specifically, reliability was measured using three items, that is, 'The company can keep the contents of the order forms confidential', 'There is reasonable compensation provided if the specialty foods from a traditional market are damaged', and 'The specialty foods will not be damaged or spoiled because of a loss of temperature control during delivery'. Assurance was measured using three items, that is, 'The company can provide a proper time to deliver the package in accordance with the receiver's special requests', 'The company can contact and inform the receiver in advance before the specialty foods arrive', and 'There is reasonable compensation provided if the company cannot provide a proper time to deliver the package in accordance with the receiver's special requests'. Tangibles was measured using two items, that is, 'The sales drivers have a neat appearance' and 'The delivery vehicles are tidy'. Empathy was measured using two items, that is, 'The company provides its customers a channel for complaints' and 'When a delivery problem occurs, the company can promptly inform the customer and resolve the problem'. Responsiveness measured using three items, that is, 'The company can provide service with politeness and kindness to customers', 'The company can provide prompt and appropriate solutions to resolve customer complaints', and 'The delivery is fast and keeps the foods fresh'. All items were measured using five-point Likert scales ranging from strongly disagree (1) to strongly agree (5).

Data analysis and results

Reliability and validity analysis

This study examines convergent validity, reliability, and discriminant validity to test the measurement model. To evaluate the convergent validity of the measurements, we use three measures proposed by Fornell and Larcker (1981): the item reliability of each measure, the composite reliability of each construct and the average variance extracted (AVE) for each construct. The item reliability of each measure is evaluated using the factor loading of the underlying construct (Shih, 2004). The results indicate that the factor loadings of all measures of the underlying constructs exceed 0.5 (0.65–0.86 for e-shopping; 0.76–0.88 for home delivery) and thus conform to the test of item reliability (Hair, Anderson, Tatham, & Black, 1995). Furthermore, all composite reliabilities exceed the recommended threshold of 0.7 (0.78–0.86 for e-shopping; 0.77–0.85 for home delivery) (Fornell & Larcker, 1981). In addition, the average variance extracted from each construct exceeds 0.5 (0.54–0.63 for e-shopping; 0.62–0.74 for home delivery), demonstrating convergent validity (Fornell & Larcker, 1981). Overall, the convergent validity test indicates that the data showed good convergent validity.

Furthermore, this study examines reliability by calculating the Cronbach's alpha for each construct. Specifically, Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group (Cronbach, 1951). Thus, to analyze the internal consistency of the constructs, the Cronbach's alpha was calculated and tested for reliability analysis. Cronbach's alphas of all constructs were higher than the minimum cutoff value of 0.7 (0.79–0.85 for e-shopping; 0.78–0.86 for home delivery) (Nunnally, 1978). These statistics indicate that reliability was adequately met.

Moreover, we examine whether the Pearson's correlation coefficients between the constructs are lower than the square root of AVE to test discriminant validity. The results indicate that the square root of the AVE for each construct is greater than its correlation coefficients with other constructs. Thus, the discriminant validity of the measures is satisfied.

The importance evaluation of customer need

In terms of the weight of importance and rank for customer need items for e-shopping, the results reveal that customers put more emphasis on the items "This website will protect customers' information rather than arbitrarily share it with others" and "It is safe to transact on this website". These results imply that customers are very concerned with the protection of personal privacy and transaction safety when they shop online. As proposed by Liao, Liu, and Chen (2011), customers' concerns with privacy will be related to intention to provide personal information to transact on the Internet. Consistent with the finding in Phelps, D'Souza, and Nowak (2001), the privacy

concern has a significant effect on purchase intentions. Liao, Liu, et al. (2011) and Liao, Chen, et al. (2011) indicated that one way to alleviate this concern is to present some forms of privacy assurance such as privacy seal and privacy policy. Additionally, Chang, Wang, and Yang (2009) proposed that designing successful online shopping businesses should emphasize on security/privacy in addition to website design, reliability and customer service. Thus, the owner of online shopping system has to pay much attention to privacy or security. Security is a crucial evaluative criterion in online shopping. When customers believe it's secure to convey private information, they will shop online (Chang et al., 2009).

The results also show that the items “This website will accurately provide transaction information and order processing” and “This website has many promotional activities” are important to customers to enhance transaction reliability and get a premium. These items are followed in importance by “The prices of the specified foods on this website are reasonable”, “The e-stores and their specialty foods on this website are reliable”, and “This website provides various payment channels”. Grewal, Hardesty, and Iyer (2004) showed that the perception of price has a significant impact on trust and willingness to buy. Moreover, as indicated by Aaker (1996), brand image is “*how a brand is perceived by consumers*”, which stands for the set of brand associations in consumers' memories. Brand image is crucial as it contributes to the consumers' judgment regarding whether or not the brand is the one for them (Dolich, 1969) and it affects consumers' subsequent buying behavior (Bian & Moutinho, 2011). Thus, a well-communicated brand image should facilitate the establishment of a brand's position, insulate the brand from competition, and increase the brand's market performance (Aaker & Keller, 1990; Keller, 1993). Furthermore, owing to customers' preferences of payment differ, providing various payment channels is also necessary to create greater convenience for them (Chen, Chang, Hsu, & Yang, 2011). In short, the statements concerning transaction safety, transaction reliability, and personal privacy protection are important, but in addition, the statements concerning the promotional activities of specified food vendors, the various payment channels and the establishment of store awareness are also crucial to marketers to retain current customers and attract new customers.

Moreover, regarding customers' needs in home delivery services, the weights of importance of the seven items all have scores over 4.5. Among the seven items, the first three items are: “The specified foods from traditional markets will not damage or spoil because of loss of warmth during the delivery process”, “The delivery speed is fast and keeps the foods fresh”, and “The company can keep the contents of order forms confidential”. The results demonstrate that customers are concerned whether the foods are fresh. Thus, HD companies should care about the quality of delivery, especially delivery speed, food temperature, and

appropriate food vehicle. Betoret, Vidal, and Fito (2011) proposed that selection and development of a suitable food vehicle that preserves the active molecular form until the time of consumption, and delivers this form to the physiological target within the organism, is a vital step to the success of a food. Chandrapala, Oliver, Kentish, and Ashokkumar (2012) mentioned that the use of ultrasonication can pasteurize and preserve foods by inactivating many enzymes and microorganisms at mild temperature conditions, which can improve food quality in addition to guaranteeing stability and safety of foods. Laguerre, Hoang, and Flick (2013) indicated a significant level of temperature with non-uniform airflow in the refrigeration equipment which leads to a deterioration in food quality and safety. Furthermore, during the delivery process, HD companies should avoid revealing information from customers' profiles such as addresses or telephone numbers because of the increase in cases of fraud and identity theft.

In addition, we also find that three other items should be important to HD companies because customers pay attention to whether the companies are able to immediately solve problems or provide compensation for mistakes when problems in the delivery process occur. These items are: “There is reasonable compensation provided if the company cannot provide a proper time to deliver the package in accordance with the recipient's special requests”, “When there is a delivery problem with specified goods from a traditional market, the company can promptly inform the package recipient and solve the problem”, and “The company can provide prompt and appropriate solutions to solve customers' complaints”. In short, if HD companies can immediately respond to customers when they encounter problems, they can transform dissatisfied customers into satisfied customers.

Evaluation of the importance of the voice of the engineer (VOE)

As Table 1 shows, the quality technique characteristics of this study are formed from a discussion with a cross-department team from an HD company. Furthermore, as Table 2 shows, the business quality technique items are developed through a discussion with a cross-department

Table 1. Summary of cross-department team.

Department	Professional title	No.	Job content
Marketing	Manager	1	Overall company marketing planning
Marketing	Marketing planning administrator	2	Activity planning
Marketing	Internet design administrator	1	Internet management
Operating department	Sales marketing manager	1	Local marketing planning
Operating department	Localized manager	1	Local executive manager

Table 2. The items of business quality techniques.

Business quality technique	Items
Marketing	(1) Awareness of traditional specialty food stores (2) Marketing public relations capacity (3) Product planning ability (4) Establishment of corporate brand image
Supplies	(5) Stable source of supply (6) Good interaction with firms (7) The cost of goods obtained is low
Logistics and home delivery service	(8) Storage space is sufficient (9) Equipment and technology for the preservation of low temperature (10) Control of goods' temperature during delivery (11) Well-trained staff (12) On-time delivery (13) Open year-round (14) Use e-mail and message to inform customers before delivery
System capacity	(15) Web design architecture (16) Order processing procedure (17) Website traffic and space (18) Management of customers' personal information (19) System performance and cost control
Administrative ability	(20) Grievance channels and subsequent processing (21) Timely processing of problems (22) Handling capacity for customer complaints (23) Accounts data management
Others	(24) Cash flow function (25) Promotional activities

team based on the quality technique characteristics and the relationship matrix.

Relationship matrix formation

Because the “whats” and “hows” may not be independent, and a “how” may influence more than one “what”, Garibay, Gutierrez, and Figueroa (2010) indicated that it is necessary to evaluate the association between the “whats” and the “hows”. Relationships are typically defined as Strong = 9, Moderate = 3, and Weak = 1. Relationships among the “whats” and the “hows” are established by a cross-department team (as Table 1 shows). As Table 3 shows, the “hows” of greatest importance are “well-trained staff”, followed by “the management of customers’ personal information” and “the establishment of a corporate brand image”. These requirements signify specific activities that should be improved to provide the largest impact on customer satisfaction. The analysis of the House of Quality is now completed, as displayed in Table 3.

Analysis of the House of Quality

Prior to the completion of the home delivery industry’s House of Quality, a correlation matrix is established

Table 3. Deployment stage of latent customers’ demands.

Dimension of customer need	Service quality element	(1)	(2)	(3)	(4)	(5)	...	(21)	(22)	(23)	(24)	(25)	Weight of importance	Rank
E-shopping (E-SERVQUAL)	1. Reliability	9	3	9	9	0	...	0	0	0	0	0	4.44	9
	2.	0	0	0	3	0	...	0	0	9	9	1	4.61	3
	3.	9	9	9	9	9	...	0	0	3	0	0	4.57	6
	4. Assurance	0	0	0	3	0	...	1	1	3	3	0	4.78	2
	5.	0	0	0	3	0	...	0	0	3	0	0	4.82	1
	6.	0	3	3	3	3	...	0	0	3	0	9	4.57	5
...
Home delivery (SERVQUAL)	25. Empathy	0	1	0	3	0	...	3	9	0	0	0	4.37	9
	26.	0	1	0	0	3	...	9	1	0	0	0	4.56	6
	27. Responsiveness	0	1	0	9	0	...	0	0	0	0	0	4.33	11
28.	0	1	0	3	0	...	9	9	0	0	0	4.51	7	
29.	0	0	1	3	9	...	0	0	0	0	0	4.75	2	
The absolute weights for technical requirements		181	529	526	534	181	...	523	505	279	243	308	9829	
The relative weights for technical requirements (%)		1.84%	5.38%	5.35%	5.43%	1.84%	...	5.32%	5.14%	2.84%	2.47%	3.13%	100%	
The executive order for technical requirements		24	4	6	3	24	...	7	8	20	22	16		

Table 4. The results of voice of engineering (VOE).

Technical elements for service quality	The absolute weights for technical requirements	The relative weights for technical requirements (%)	The executive order for technical requirements
Well-trained staff	790	8.04	1
Management of customers' personal information	543	5.52	2
Establishment of corporate brand image	534	5.43	3
Marketing public relations capacity	529	5.38	4
Order processing procedure	528	5.37	5
Product planning ability	526	5.35	6
Timely processing of problems	523	5.32	7
Handling capacity for customer complaints	505	5.14	8
Web design architecture	497	5.06	9
Grievance channels and subsequent processing	495	5.04	10
System performance and cost control	491	5.00	11
Website traffic and space	395	4.02	12
Use e-mail and message to inform customers before delivery	319	3.25	13
Maintaining temperature of goods during delivery	318	3.24	14
Open year-round	309	3.14	15
Promotional activities	308	3.13	16
Storage space is sufficient	297	3.02	17
Good interaction with firms	285	2.90	18
Equipment and technology for the preservation of low temperature	285	2.90	19
On-time delivery	279	2.84	20
Accounts data management	279	2.84	21
Cash flow function	243	2.47	22
Cost of obtained goods is low	189	1.92	23
Awareness of traditional specialty food stores	181	1.84	24
Stable source of supply	181	1.84	25

between the VOC and VOE characteristics. As shown in Table 4, the results indicate that “well-trained staff” and “the management of customers' personal information” are important to HD companies, followed by “the establishment of a corporate brand image”, “marketing public relations capacity”, and “the order processing procedure”. Thus, to improve customers' trust, the establishment of a good corporate brand image is also quite important to HD companies. Furthermore, we know that good marketing activities attract customers' attention; however, it is more important to HD companies to effectively apply public relations to achieve that goal. Once consumers perceive that communicators are making every effort to get information across, their credibility and trust to the message and the communicators will be improved (Rutsaert et al., 2013). In addition, effective customer data management is also crucial to HD companies because they enable the companies to use statistical methods such as data mining and regression to acquire potential customers. Moreover, to increase the reliability of transactions and delivery, as well as to increase customers' willingness to continue to place orders, it is necessary to make the order processing procedure more clear, easy and reliable.

The establishment of new service development

Regarding specialty foods purchases, because online orders need to be delivered to customers by logistics services

providers (e.g., the home service provider), customers realize that the waiting time of receipt of goods purchased online is longer than the time spent by directly purchasing the goods from a traditional market. Thus, to increase customers' willingness to shop online, improvements in order processing, hardware, the connection between the database and suppliers, and the introduction of vendor managed inventory (VMI) are critical for HD companies. Fig. 2 displays the current process (AS-IS) and the process after improving (TO-BE). More precisely, Fig. 2 illustrates that the home delivery service model of specialty foods from traditional markets will be more efficient after improvements to the current process. Furthermore, as Table 5 shows, the results of this study demonstrate the five phases in which specific directions of service design related to quality technical characteristics can be provided to HD companies to improve their service performance.

Summary and concluding remarks

In general, companies have difficulty continually and equally investing in resources for services because their resources are limited. However, it is more important for companies to satisfy the consumer voice to retain current customers and attract new customers. Thus, understanding the real needs of customers is of crucial concern to maximize companies' resources. To achieve this goal, this study first uses SERVQUAL to obtain the VOC toward HDSs and

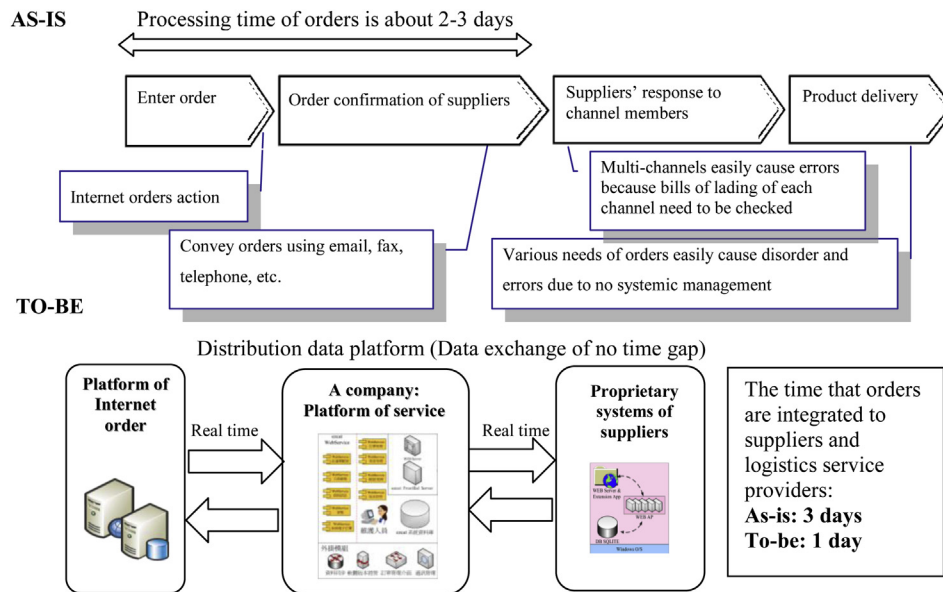


Fig. 2. Order processing procedure.

applies E-SERVQUAL to acquire the VOC regarding the perceived service quality of e-shopping individually. Then, QFD is used to find the priority of service improvements to develop proper strategies and maximize resource usage. Specifically, this study uses QFD to develop a home delivery service model for specialty foods from traditional markets. Based on our results, in the area of VOC, when customers shop online, they are concerned with the protection of personal privacy, transaction safety, the accuracy of transaction information, the status of order, the provision of various promotional activities, reasonable product pricing, and various payment channels. Thus, HD companies should keep the contents of order forms confidential and create a protected transaction environment to ease the customer's mind. Further, HD companies should endeavor to relieve consumers' security concerns and raise consumers' belief in the trustworthiness of services. To acquire consumers' confidence, focusing on the promotion of technical protections and security statements to consumers in the e-shopping system is required when designing security systems (Kim, Tao, Shin, & Kim, 2010). In addition, to ensure the accuracy of customers' transaction information, the e-shopping system of specialty foods integrated with HD can automatically send a confirmation e-mail consisting of transaction information (e.g., product name, quantity, amount, and receiver's address) to customers after they place the order online. The e-shopping system of specialty foods integrated with HD should also offer the order tracking function to customers such that they can easily access the order status after engaging in e-shopping. Furthermore, the e-shopping system of specialty foods integrated with HD should consider offering the function of product price comparison for customers to conveniently check the

rationality of product pricing. Also, HD companies should frequently provide promotional activities to increase existing customers' repurchase intentions and their ease of getting a premium, as well as to attract potential customers' patronage. Besides, HD companies need to provide various payment channels to increase the convenience of customers' payment.

As to HDS for specialty foods from traditional markets, our study finds that customers concern with the speed of delivery service, quality (freshness) of specialty foods, as well as quick responses and reasonable compensation from HD companies when problems such as failures or product damages occur during delivery. To improve the speed of delivery service, HD companies should establish reliable and efficient order processing procedure and vehicle routing planning (Ehmke & Mattfeld, 2012). Furthermore, Ryu, Lee, and Kim (2012) found that high food quality results in good image, and in turn, generates high customer perceived value, customer satisfaction and intent to return, and spread of positive word-of-mouth. Hence, for HD companies, a priority should be given in maintaining and improving high quality of specialty food to establish favorable image that differentiates it from competitors. One way as proposed by Betoret et al. (2011) is choosing and developing an appropriate food vehicle that preserves the food quality until consumption. Another way as mentioned in Chandrapala et al. (2012) is the application of ultrasonication that improves food quality and guarantees stability and safety of foods. Besides, we know that service failure is difficult to avoid in service industry and is easy to lead to customer dissatisfaction (Colgate & Norris, 2001). Hence, as indicated by Hsu et al. (2011), in addition to quickly responding customers' problems during delivery, HD

Table 5. Design proposals for the new service.

Quality technical characteristics	The order of importance	Service design
Well-trained staff	First phase (weight is above 5.3%)	■ To strengthen various aspects of employees' basic training
Management of customers' personal information		■ Introduce information security of ISO 27001
Establishment of corporate brand image		■ Increase the proportion of payments on delivery instead of online credit card
		■ Consignment data of sender is replaced by two-dimensional bar code
Marketing public relations capacity		■ Continue to enhance brand awareness
Order processing procedure	■ Enhance the linkage between the image of company and delicious food	
	■ A press conference to publicize the new service	
Product planning ability	■ Invite reporters to traditional markets to visit specialty businesses	
	■ Build integrated systems to shorten the time of order exchange	
Timely processing of problems	■ Warehousing the goods in advance and shortening the manufacturers' shipping lead time	
	■ Day-of-delivery mechanisms to accelerate delivery time	
Handling capacity for customer complaints	Second phase (weight is above 5.0%)	■ Inquiries into specialties of well-known traditional markets
		■ Merchandise mix design (e.g., across traditional market purchases)
■ Authorized permissions of staff and on-the-spot staff		
■ Set up online customer service		
■ Enhance customer service training		
■ Authorized permissions of staff and on-the-spot staff		
■ Recruitment of professional web designers		
■ Set up mail and complaint hotline		
■ Dedicated units to track the progress of complaint handling		
■ Upgrade hardware on a regular basis to improve performance		
Website traffic and space	Third phase (weight is above 3.0%)	■ Expand flow and data storage hardware depending on amount of traffic
Use e-mail and message to inform customers before delivery		■ Strengthen the execution of site personnel
		■ Build active SMS notification system
Maintaining temperature of goods during delivery		■ Strengthen the sensitivity of field service personnel to maintaining low-temperature goods
		■ Continuing the procurement of low-temperature storage
Open year-round promotional activities	■ Proper arrangements for holiday duty manpower	
	■ Design various promotional activities according to products; for example, free shipping	
Storage space is sufficient	■ Cross-market promotional activities	
	■ Goods into the warehouse ahead of time	
Good interaction with firms	Fourth phase (weight is above 2.0%)	■ Introduce VMI inventory management
		■ Establish a good relationship with vendors
■ Continue to purchase low-temperature storage equipment, refrigerators and other		
■ New additional low-temperature storage and transshipment Tally Room		
On-time delivery		■ Continue to enhance the base density
		■ Increase the delivery staff
Accounts data management		■ Personnel management
		■ Introduce the SAP system
Cash flow function		■ Offer various methods of payment; for example, cash on delivery or payment at convenient stores
		■ Establish good relationship with firms to obtain lower cost
Cost of obtained goods is low	Fifth phase (weight is below 2.0%)	■ Choose high-awareness firms early
Awareness of traditional specialty food stores		■ Establish good relationship with firms
Stable source of supply		

companies should take full responsibility for delivery damage if it is a fault in the service process, as the successful service recovery is a strategic means to transform dissatisfied customers into loyal ones.

Finally, in the area of VOE, our results show that a well-trained staff, the management of customers' personal information, the establishment of a corporate brand image, marketing public relations capacity, the order processing

procedure, product planning ability, and the timely ability to manage problems are very important for HD companies. Specifically, HD companies should improve the training of personnel because the interaction between staff and customers can directly provide clues for management to improve and maintain the service quality to retain customers (Hsu et al., 2011). Furthermore, HD companies should focus on the establishment of a good corporate brand image and the preservation of personal privacy to enhance customers' trust toward online shopping and the specialty food providers' inclination to cooperate with them. The manipulation of marketing public relations from HD companies could be also helpful for themselves and specialty food providers to contribute good brand image and profitability. Additionally, HD companies should endeavor to improve and maintain system performance to increase the efficiency of order processing and the effectiveness of managing customers' information when they undertake e-shopping. By doing so, specialty food providers also can effectively engage in e-marketing through the e-shopping system of specialty foods integrated with HD, and increase the sales of specialty foods, and in turn, increase HD companies' and specialty food providers' profitability. Moreover, possessing the planning ability of specialty foods is also very important to HD companies to effectively utilize the specialties of well-known traditional markets and design product mix across traditional market purchases. Besides, HD companies should offer various communication channels to create greater convenience for customers when they have any queries during shopping online or when have problems occur during delivery. In summary, the results of this study provide service marketing researchers and practitioners a base beyond mere insight about the nature and effects of service characteristics.

Research limitations and directions for future research

Although our findings have significant implications for academic researchers and practitioners, some limitations exist in this study. First, data collection focused on a particular home delivery company. Thus, future research could attempt to apply the results to other home delivery companies to broaden the scope of the study. Second, this study utilized the customers of a particular HD company as test subjects; thus, the results may not fully represent the expectations of the entire population of Taiwan or other countries. Future research could examine whether the results of this study can be applied to different countries. Finally, the VOE is obtained from a discussion with a cross-department team, causing many items to fail to be quantified, such as the establishment of a corporate brand image. Thus, future research could attempt to establish the value of the corporate brand image to determine the results of VOE.

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