Description of Florists' Cognitive Structure and Perceived Performance of Supplier Services through Second-order Factor Analysis

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Abstract. Retail florists' performance ratings of services provided by wholesale growers, wholesale florists, and grower-shippers/brokers were factor-analyzed to yield a hierarchical classification of customer service in floral distribution. Nine customer service factors were identified and three major independent classes of customer service were defined, including 1) physical distribution, 2) marketing, and 3) product quality services. Florists rated the performance of suppliers' physical distribution services higher than marketing and product quality services. Florists' perception of physical distribution and product quality services did not vary across type of supplier, but for marketing services, florists rated wholesale growers higher in performance than wholesale florists. The hierarchical classification of customer service and service performance profiles provide the floral industry with relevant market information for the successful development and effective implementation of customer service programs.

Performance of service within the floriculture industry is important, as it represents a major share of marketing costs among producers, wholesalers, and retailers (Goodrich, 1980; Sullivan et al., 1980). However, effective communication of desired service levels among growers, shippers, wholesalers, and retailers is sometimes lacking, and this often results in less than ideal service performance (Prince, 1985). The end result is that floral firms may lose their competitive position in the marketplace, not because their product quality is low, but because they fail to offer the excellence in service that is expected.

In today's worldwide floral distribution channels, the U.S. supplier is in a key position to exploit the benefits that customer service has to offer. Domestic suppliers usually have closer contacts with their customers and may have a better understanding of local market conditions than their foreign counterparts. The domestic supplier may, therefore, ascertain customer service needs more readily and develop service strategies to meet those requirements more easily. The performance of quality services will not only help to attract new customers, but will also assist suppliers in improving business relations with existing customers (Berry, 1983).

For domestic floral suppliers to exploit the benefits that customer service has to offer, two basic questions require an answer: 1) What are the components of customer service and how are they structured? and 2) What areas of service performance need improvement to remain competitive in the global marketplace?

The concept of customer service has been laden with many definitions that vary among industries (Hopkins and Bailey, 1970) and within functional units of a particular business (LaLonde and Zinszer, 1976). Some simple descriptions of customer ser-

vice include "the actions taken to sell the prospect and gain repeat sales" (Hopkins and Bailey, 1970). A more comprehensive definition of customer service is "a customer-oriented corporate philosophy which integrates and manages all elements of the customer interface within a predetermined optimum cost-service mix" (LaLonde and Zinszer, 1976). In the floral industry, recently various service activities defining customer service have been described (Prince et al., 1990), but no structural classification of customer service or profiles of service performance have been formulated.

The primary objective of this research was to develop a systematic classification of customer service as it currently exists in the floriculture industry, specifically among floral suppliers (wholesale growers, wholesale florists, grower-shippers, and brokers), and their retail florist customers. A second objective was to profile the florists' perception of the suppliers' performance of various service activities.

A descriptive classification of customer service would assist floral managers in gaining a fuller understanding of customer service activities and their operation in floral distribution. To provide the clearest description of customer service, this classification should define various components of customer service strategy and should feature relatively few mutually independent elements of the service system. The classification should also depict the structural relationships among the services as perceived by practitioners in the industry. The service performance profiles should provide floral suppliers with market information about their strengths and weaknesses in the performance of these services, thereby identifying opportunities for the development of successful service programs.

Materials and Methods

The survey. Perceptions of supplier services were obtained from the buyers' perspective, as advocated by LaLonde et al. (1988). Questionnaires were pretested and modified before their random distribution to managers of retail florist businesses in 12 Midwestern states (including Ohio, Indiana, Missouri, Kansas, and states to their north) during May through July 1988. The random sample of florists was drawn from membership lists of Florists' Transworld Delivery, the Society of American Florists, and Florafax Assn. International. The suppliers were

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Table 1. Loadings of customer service performance measures on nine correlated first-order service factors.^a

Customer service performance measures	First-order factor description	Factor loadings								
		1	2	3	4	5	6	7	8	9
Salesforce knowledge of cultivars	1) Salesforce/customer relations	0.65								
Understanding customers' needs		0.55								
Ability to build business relationships		0.52								
Courtesy of salespeople		0.47								
Advance communication of order changes		0.47								
Salesforce knowledge of postharvest handling	2) Marketing and promotional support	0.41								
Provision of educational programs			0.75							
Provision of advertising promotional support			0.68							
Provision of clip art, posters, advertising aids			0.61							
Provision of point-of-purchase packaging			0.57							
Provision of exclusive product availability	3) Ordering, shipping, and billing operations		0.55							
Dissemination of marketing information			0.51							
Provision of credit				0.62						
Delivery of product to customer's doorstep				0.60						
Provision of flexible credit policies				0.48						
Convenience in ordering	4) Value pricing and discounts			0.42						
Ability to ship small and large shipments				0.40						
Provision of quantity discounts					0.81					
Competitive pricing of floral products					0.71					
Provision of discounts for cash payments					0.61					
Price/quality relationship of products	5) Transport speed, reliability, and flexibility				0.43					
Pricing discounts during oversupply periods					0.40					
Quick delivery of product from time of order						0.84				
Shipping speed						0.77				
On-time delivery of products						0.76				
Expediting orders when requested	6) Packaging and labeling					0.69				
Consolidating deliveries when requested						0.60				
Delivery consistency throughout the year						0.48				
Substitution policy for unavailable products						0.41				
Provision of boxing standards							0.78			
Standardization and containerization of products	7) Product quality maintenance						0.77			
Accuracy of box and container labeling							0.65			
Packaging to minimize damage in shipment							0.59			
Understandable labeling of product							0.40			
Provision of preharvest and postharvest treatments								0.40		
Provision of postharvest handling information	8) Product mix							0.34		
Quality of delivered product								0.30		
Number of different floral products available									0.78	
Availability of unique product throughout the year									0.71	
Number of varieties of a species readily available									0.71	
Guarantee of floral products	9) Post-sale support									0.76
Product support after the sale										0.71
Fair treatment of customers in the handling of claims										0.70
Ability to promptly rectify a problem situation										0.56
Extended business hours										0.42

^aPrincipal components factor model using nonorthogonal rotation.

wholesale growers, wholesale florists, grower-shippers, and brokers of floricultural products. The floral buyer for each florist firm rated the performance of supplier services on 50 issues related to major customer service activities. These service activities and business characteristics of the survey respondents are described by Prince et al. (1990).

Questionnaire format used 7-point rating scales and 7-point Likert scales for the performance level of service provided. The rating scales required respondents to indicate the performance of the services on bipolar scales anchored by the words "very poor" for rating 1 and "very good" for rating 7. The 7-point Likert scales measured service performance from an attitudinal perspective in which respondents indicated the strength of their

attitude toward service performance. The Likert scales were anchored by the words "strongly disagree" for rating 1 and "strongly agree" for rating 7. Both the Likert and the 7-point rating scales have been shown to reduce the burden on the respondent and to minimize random variation in response, compared to other types of measurement scales (Cox, 1980).

For the study, 502 questionnaires were returned (25% response rate). Reliability analysis (Cronbach, 1951) and nonresponse bias tests (Miller and Smith, 1983) were conducted to ascertain survey item reliability and validity of the survey data. Test results indicated that the survey items achieved an acceptable level of reliability and that nonresponse bias was not a serious threat to the validity of the results. Furthermore, the

random sampling of firms from the population allowed for the generalizing of survey results to the Midwestern retail florist population at large.

First-order factor analysis. To determine the descriptive structure of customer service in the floral industry, the first step was to conduct a factor analysis of the 50 performance measures of supplier services rated by retail florists. Factor analysis (Rummel, 1970) has been used extensively in marketing research (Stewart, 1981) and, to some extent, in horticultural research (Broschat, 1979) to define the underlying dimensions and structural classification of a set of measure; From a correlation matrix of scaled variables, the technique defines the patterns among the bivariate correlations in the matrix.

The 50 performance measures of customer service were subjected to a principal components factor analysis using the SPSS/PC+ advanced statistical package (Norusis, 1986). The analysis defined a smaller number of service factors that account for the correlations among the 50 service performance measures. The Scree test (Cattell, 1966) was used to determine the number of factors to retain. This test indicated that nine customer service factors would obtain the best description of simple structure from the 50 service performance measures.

The factors were rotated using oblique rotation to more easily define groups of related service measures (Rummel, 1970). Factor loadings, analogous to correlation coefficients, represented the degree and direction of the relationship between the original service performance measures and the newly defined service factors. Generally, service measures with loadings > 0.40 were used to interpret the factors. The names given to the factors were descriptive and reflected the loadings of the service performance measures on the factors.

Second-order factor analysis. To define a hierarchical structure and classification of customer service, a second factor analysis, like the first, was performed on the first-order results. This analysis defined the relationships between the nine service factors and higher-order factors. A correlation matrix of the nine service factors was used as input to the second-order analysis. The statistical procedure extracted three second-order service factors underlying the nine first-order factors. This analysis served to define a small, basic set of dimensions through which customer service operates.

Service performance profiles. The suppliers' level of performance on each service factor was computed as an average of the 7-point performance measures that loaded on a factor. The mean performance scores for the first- and second-order factors were segmented by the three major types of suppliers identified: wholesale growers, wholesale florists, and a third group comprised of distant grower-shippers and brokers. Mean comparison of performance score on a service factor for each type of supplier was conducted using Duncan's multiple range test at $\alpha = 0.05$.

Results and Discussion

First-order results. The first-order factor analysis of the 50 service performance measures defined nine major customer service factors in floral distribution (Table 1). The reduced set of nine service factors explained 65% of the variance in the original set of 50 service measures. From the factor loadings of Table 1, the nine customer service factors were defined as: 1) salesforce/customer relations; 2) ordering, shipping, and billing operations; 3) transport speed, reliability, and flexibility; 4) post-sale support; 5) marketing and promotional support; 6) value pricing and discounts; 7) packaging and labeling; 8) product

mix; and 9) product quality maintenance. These nine factors represent the major areas of the customer service system and define the first tier in the hierarchical structure of customer service in floral distribution.

The relationships among the nine service factors were of low to moderate positive correlation (Table 2), indicating that a performance increase in one service factor was generally related to a performance increase in another. This finding exemplifies the interrelated nature of customer service and its constituent components. Some of the strongest associations were among the salesforce/customer relations, transport speed/reliability, and the post-sale support factors. Not surprisingly, these factors span the time cycle of customer service performance from pretransaction-, transaction-, and post-transaction-based services.

Second-order results. The second-order factor analysis extracted three higher-order service factors that accounted for the correlations among the nine first-order service factors (Table 3). These three explained 55% of the variance of the nine first-order factors. From the factor loadings, the three higher-order factors were: 1) physical distribution services, 2) marketing services, and 3) product quality services. These three factors defined the basic dimensions or independent classes of service through which customer service operates in floral distribution.

The hierarchical structure of the entire customer service system, including service activities, nine first-order factors, and three second-order factors, is presented in Fig. 1. This graphical classification represents the cognitive structure of retail florists' perceptions toward the performance of supplier services in floral distribution.

The physical distribution class of customer service included factors relative to salesforce/customer relations; ordering, shipping, and billing operations; transport speed and reliability; and post-sale support services. This class of customer services is involved primarily with "servicing demand" in the movement of floral product from supplier to customer. The major objective in the performance of these services is to achieve repeat floral purchasing and to retain valued customers.

The second major class of customer service, marketing services, included factors relative to marketing and promotional support, value pricing and discounts, packaging and labeling, and product mix. These service factors are closely related to three major elements of the marketing mix concept: product, price, and promotion. This class of customer service is involved pri-

Table 2. Correlations among nine customer service factors in floral distribution.

Customer service factors	Customer service factors ^a								
	1	2	3	4	5	6	7	8	9
1	1.00								
2	0.11	1.00							
3	0.14	0.09	1.00						
4	0.22	0.27	0.12	1.00					
5	0.40	0.13	0.21	0.26	1.00				
6	0.29	0.33	0.10	0.29	0.39	1.00			
7	0.06	0.04	0.01	0.05	0.06	0.05	1.00		
8	0.30	0.34	0.13	0.31	0.37	0.38	0.05	1.00	
9	0.36	0.24	0.24	0.31	0.45	0.35	0.02	0.44	1.00

^aService factors comprise: 1) salesforce/customer relations; 2) marketing and promotional support; 3) ordering, shipping, and billing operations; 4) value pricing and discounts; 5) transport speed, reliability, and flexibility; 6) packaging and labeling; 7) product quality maintenance; 8) product mix; and 9) post-sale support.

Fig. 1. Florists' cognitive structure of the performance of supplier services in floral distribution.

Table 3. Loadings of nine first-order service factors on three second-order orthogonal factors.^z

First-order service factors	Second-order factor description	Second-order factor loadings		
		1	2	3
Transport speed, reliability, and flexibility	1) Physical distribution services	0.72		
Salesforce/customer relations		0.66		
Post-sale support		0.62		
Ordering, shipping, and billing operations		0.58		
Marketing and promotional support	2) Marketing and promotional services		0.80	
Packaging and labeling			0.63	
Product mix			0.63	
Value pricing and discounts			0.59	
Product quality maintenance	3) Product quality services			0.97

^zPrincipal components factor model with orthogonal rotation.

marily in "generating demand", as these services may induce more floral purchasing by current customers and generate floral purchasing from new customers.

The third major class of customer service was confined to the factor of supplier maintenance of product quality. From factor loadings in Table 3 and correlations among service factors in Table 2, performance of product quality services is perceived as being distinct from both physical distribution and marketing classes of customer service. Product quality is in a class of service by itself. The emergence of product quality as a first- and second-order factor revealed its high level of strategic importance in the performance of customer service in floral distribution.

The suppliers' performance ratings for the first- and second-order service factors, segmented by type of floral supplier, are presented in Table 4. Retail florists rated suppliers' performance of physical distribution services higher than their performance of marketing services ($t = 31.6$) and product quality services ($t = 17.4$). Within the physical distribution class of customer service, there was no significant perceived difference in the level of performance among types of floral suppliers. The performance ratings for suppliers' physical distribution services ranged from 5.6 to 6.0 on a 7-point performance scale, an indication of good, but not exceptional, service performance.

The marketing class of customer service revealed much lower service ratings than the physical distribution class of service, with ratings ranging from 3.6 to 5.8. In general, product mix was the highest rated factor in this class, while the marketing and promotional support factor was rated lowest. For each service factor within the marketing class of customer services, florists rated wholesale growers slightly higher in service performance than wholesale florists.

The performance ratings for the product quality class of customer service yielded no significant differences among types of floral suppliers. The rating for product quality maintenance ranged from 5.1 to 5.4, an indication of service above mediocre performance, but well below a "very good" (7.0) rating.

The service ratings suggest that there may be substantial opportunity for improvement in suppliers' performance of services, especially among wholesale florists. In particular, perceived performance levels of marketing and product quality services lag below performance levels of physical distribution services. Therefore, we suggest that floral suppliers direct attention to the marketing and product quality classes of customer service, as these service areas appear to have the greatest opportunity for improvement.

Overall, this research provides the floral industry guidelines for the development of effective customer service programs.

Table 4. Customer performance ratings of supplier service factors segmented by type of supplier.

Service factors	Supplier type		
	Wholesale grower	Wholesale florist	Grower shipper/broker
	<i>Mean^a</i>		
Physical distribution services	5.8	5.8	5.9 ^{NS}
Salesforce/customer relations	5.8	5.6	6.0 ^{NS}
Ordering, shipping, and billing operations	6.0	6.0	5.8 ^{NS}
Transport speed, reliability, and flexibility	5.7	5.7	5.8 ^{NS}
Post-sale support	5.8	5.7	6.0 ^{NS}
Marketing services	5.0 a	4.6 b	4.7 ab
Marketing and promotional support	4.3 a	3.9 b	3.6 b
Value pricing and discounts	4.5 a	4.1 b	4.3 ab
Packaging and labeling	5.3	5.0	5.4 ^{NS}
Product mix	5.8 a	5.4 b	5.6 ab
Product quality			
Product quality maintenance	5.4	5.1	5.3 ^{NS}

^aSeven-point performance scale, with 1 = very poor and 7 = very good service.

Mean separation within rows by Duncan's multiple range test, $P = 0.05$.

The structural classification provides a conceptual framework for an improved understanding of customer service and its operation in floral distribution. The classification may assist suppliers in the development of more focused and effective marketing strategies. The three classes of customer service may be viewed as three strategic dimensions of a supplier's service program. Within each service dimension, suppliers may direct their resources to key service areas to improve their overall market position, vis-a-vis domestic and foreign competition.

The customer service performance profiles, segmented by type of supplier, provide an evaluation of the industry's performance level of each major service activity and each class of customer service. Thus, these profiles provide an indicator of the relative strengths of the industry's current service offerings and identify opportunities for service improvement. Knowledge of retailers' perceptions toward supplier services may allow management to take a more proactive role in the successful implementation of service programs that are more closely targeted to the needs of customers.

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