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Designing and Positioning Food Services for Multicultural Markets

Rohit Verma

Cornell University, rv54@cornell.edu

Madeleine E. Pullman

Southern Methodist University

John C. Goodale

Ball State University

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Designing and Positioning Food Services for Multicultural Markets

Abstract

[Excerpt] Businesses that seek to develop an appropriate operations strategy for serving a multicultural customer market face challenges that are distinct from businesses that serve a relatively homogeneous local market. While the strategic implications of expanding services from a domestic market to international locations have been well documented, the issue of dealing with multinational customers at a single location has largely been neglected by researchers, as far as we can determine.

This paper attempts to fill the research gap by presenting a method for determining the extent to which restaurant managers should maintain standard menus and food items, as opposed to customizing their operations for different ethnic and cultural groups. To that end, we applied a customer-based approach to help managers at four international-airport food outlets to improve their food-service revenues from their three major passenger groups: English-, Japanese-, and Spanish-speaking customers. In this case, language preference was used as a proxy for cultural identity. We submit that although there are many differences among, say, English-speaking peoples, they are more similar to each other than they are to, say, Spanish speakers. Moreover, the language a person speaks is a substantial factor in trying to communicate in a particular location. One can guess that Japanese speakers in the United States, for example, might experience more language barriers than either English or Spanish speakers.

We present an approach for modeling the preferences of different cultural groups, evaluating the differences among the groups, and determining a strategy to maximize market share for each of the four food-service providers that we studied. Indeed, one food-service vendor implemented our study's recommendations and enjoyed a substantial revenue gain over the previous year's same-period sales. We believe that the method we propose has valuable implications for any service provider who must consider operating strategies for a multicultural or multinational site, although we focus on the distinct concept of a domestic foodservice business that serves a multicultural market.

Keywords

food service, restaurant management, menus, multicultural markets, sales

Disciplines

Hospitality Administration and Management

Comments

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Designing and Positioning Food Services for Multicultural Markets

by Rohit Verma,
Madeleine E. Pullman, and
John C. Goodale

People waiting in an airport are far from being a captive audience, and it behooves food-service operators to determine what those customers want.

Businesses that seek to develop an appropriate operations strategy for serving a multicultural customer market face challenges that are distinct from businesses that serve a relatively homogeneous local market. While the strategic implications of expanding services from a domestic market to international locations have been well documented, the issue of dealing with multinational customers at a single location has largely been neglected by researchers, as far as we can determine.

This paper attempts to fill the research gap by presenting a method for determining the extent to which restaurant managers should maintain standard menus and food items, as opposed to customizing their operations for different ethnic and cultural groups. To that end, we applied a customer-based approach to help managers at four international-airport food outlets to improve their

food-service revenues from their three major passenger groups: English-, Japanese-, and Spanish-speaking customers. In this case, language preference was used as a proxy for cultural identity. We submit that although there are many differences among, say, English-speaking peoples, they are more similar to each other than they are to, say, Spanish speakers. Moreover, the language a person speaks is a

Rohit Verma, Ph.D., is an assistant professor in the Kellstadt Graduate School of Business at DePaul University «rverma@uipost.depaul.edu».

Madeleine E. Pullman, Ph.D., is an assistant professor in the Cox School of Business at Southern Methodist University «mpullman@mail.cox.smu.edu».

John C. Goodale, Ph.D., is an assistant professor in the College of Business at Ball State University «jgoodale@bsu.edu».

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substantial factor in trying to communicate in a particular location. One can guess that Japanese speakers in the United States, for example, might experience more language barriers than either English or Spanish speakers.

We present an approach for modeling the preferences of different cultural groups, evaluating the differences among the groups, and determining a strategy to maximize market share for each of the four food-service providers that we studied. Indeed, one food-service vendor implemented our study's recommendations and enjoyed a substantial revenue gain over the previous year's same-period sales. We believe that the method we propose has valuable implications for any service provider who must consider operating strategies for a multicultural or multinational site, although we focus on the distinct concept of a domestic food-service business that serves a multicultural market.

Process and Product

We believe that a major component of establishing a strategy for responding to different cultural groups is to determine both process and product attributes. Process attributes include waiting time, employee interactions with customers, reliability, and speed of completing transactions.¹ Product attributes cover tangible items such as employee appearance, building design, cleanliness levels, branding variety, and printed materials. Depending on the service concept and operating strategy, one would expect that certain service attributes should be adjusted for different cultural segments, while others have universal appeal. Many times, however, restaurants' attributes are standardized, having been patterned after successful domestic or international operations.

We suggest an approach for determining the extent of both service-product and process-attribute standardization versus customization in multicultural settings. Specifically, we:

- Present an approach for identifying the needs and preferences of customers of different nationalities or cultures;
- Demonstrate how key differences between the needs and preferences of different customer groups may be quantified; and
- Demonstrate the influence of different operating strategies on market performance in multicultural environments.

We first discuss the previous research on multicultural customer groups' different expectations and perceptions of services. We then outline our method for addressing those issues in the formulation of operations strategy and service design. Next, we describe how our method was applied to food-service improvements at a major international airport terminal in the United States (Chicago's O'Hare). We provide the implications and recommendations for managers and discuss the results from the implementation. Finally, we discuss the significance of our findings and draw conclusions based on the study.

The Matter of Culture

Many business researchers have studied national character or cultural differences.² According to Clark, national character is defined as enduring personality characteristics among the populations of particular nation states. Cross-national studies are valuable in international market settings because (1) national differences exist, (2) these differences can

be observed and tabulated, and (3) observed differences have significant bearing on both consumer behavior and the strategic decision-makers in firms. Research has focused largely on the standardization level of marketing strategies during globalization.³ Research has also shown that customers from different cultures and nationalities have different expectations from services and perceptions of the actual service delivered. In 1998 Donthu and Yoo studied the effects of consumers' cultural orientation on their expectations of bank services.⁴ They found relationships between groups' cultural orientation and their expectations of banks' service-quality dimensions of reliability, responsiveness, empathy, and assurance. Lee and Ulgado discovered that South Korean and American consumers held different perceptions of fast-food services.⁵ In their study, American consumers preferred corporate reputations or brand names, low prices, and consistent quality, while Korean customers, on the other hand, valued reliability and empathetic employees.

Given that different cultural expectations and perceptions of services can exist, managers need to know whether their service strategy should, for example, emphasize or target the needs of one group (in terms of revenue potential or other objectives), all groups simultaneously, or different groups at different times.

¹ See: Clark, pp. 66-79; S.C. Jain, "Standardization of International Marketing Strategy: Some Research Hypotheses," *Journal of Marketing*, Vol. 53, No. 1(1989), pp. 70-79; and R. Martenson, "Is Standardization of Marketing Feasible in Culture-bound Industries? A European Case Study," *International Marketing Review*, Vol. 4, No. 3 (1987), pp. 7-17.

² N. Donthu and B. Yoo, "Cultural Influence on Service Quality Expectations," *Journal of Service Research*, Vol. 1, No. 2 (1998), pp. 178-186.

³ M. Lee and F. Ulgado, "Consumer Evaluations of Fast-food Services: A Cross-national Comparison," *Journal of Services Marketing*, Vol. 11, No. 1 (1997), pp. 39-52.

⁴ For an extensive review, see: T. Clark, "International Marketing and National Character: A Review and Proposal for an Integrative Theory," *Journal of Marketing*, Vol. 54, No. 4 (1990), pp. 66-79.

¹ Often referred to as "throughput."

Service differentiation. Strategies for service-differentiation fall on a continuum from "one size fits all" (e.g., McDonald's success in adapting to multinational environments with minimal modifications) to totally personalized experiences for each customer, or the so-called "mass customization" that has lately come into vogue.

Ideally, if the service firm has the ability to customize the service for each client, this approach could address any cultural or personal preferences. One approach to personalized service is known as "industrialized intimacy," as proposed by Kolesar, Van Ryzin, and Cutler.⁶ Those researchers suggest that industrialized intimacy in a mass market is achieved through information systems that track an individual customer's history and preferences, thus allowing a personal touch in service. Examples of companies using information systems in this manner include Ritz-Carlton⁷ and British Airways.⁸ While this approach works well with a base of repeat or loyal customers, industrialized intimacy would be hard to implement in anonymous service settings or transient markets, such as at a fast-food outlet in an airport terminal. Additionally, a strategy that attempts to give the best service to every customer may be unnecessary and expensive.⁹

⁶P. Kolesar, G. Van Ryzin, and W. Cutler, "Creating Customer Value through Industrialized Intimacy," *Strategy and Business*, Vol. 12 (1998), pp. 33-43.

⁷See: N. Klein, W.E. Sasser, and T.O. Jones, "The Ritz-Carlton: Using Information Systems to Better Serve the Customer," Harvard Business School Case 9-395-064 (1995); and Dubé and Renaghan, "Surprisingly Simple Routes to the Top," in this issue of *Cornell Quarterly*, pp. 34-41.

⁸N. Klein and W.E. Sasser, "British Airways: Using Information Systems to Better Serve the Customer," Harvard Business School Case 9-395-065 (1994).

⁹R.E. Kordupleski, R.T. Rust, and A.J. Zahorik, "Why Improving Quality Doesn't Improve Quality (or, Whatever Happened to Marketing?)," *California Management Review*, Spring 1993, pp. 82-95.

Managers often have some advance cues about the mix of their customer groups. For example, airlines and airports can estimate the mix of nationalities from historic records and national airlines' times of arrivals and departures. This information can be used to customize services for those customers during certain time periods or in certain parts of the airport. An example of this concept would be creating a sub-brand for a group with a high yearly revenue potential. Hilton International Hotels did this in 1992 with "Wa No Kurutsogi," a special amenity and service package aimed at its Japanese clientele.¹⁰ Some 32 Hiltons offered guest-service materials written in Japanese, Japanese food and beverage offerings, and special slippers and *yukata*.

The upshot of the research we have seen is that some services can be standardized while others should be customized to address individual customers' needs. To address the issue of how much customization is appropriate, managers need to determine (1) the customer's expectations of each important service attribute, (2) the attributes that are appropriate for standardization for all groups or customization for a specific group, and (3) the economic feasibility of customizing pertinent attributes.

Determining Customer Preferences

One method for determining the attribute levels of a new service involves modeling customer preferences in response to experimentally designed service profiles. This approach, commonly known as probabilistic discrete choice analysis (DCA) has been used to model choice processes of decision-makers in a variety of academic disciplines,

¹⁰See: Glenn Withiam, "Wa No Kutsurogi," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 33, No. 1 (February 1992), p. 14.

including marketing, operations management, transportation, urban planning, hospitality, and natural-resource economics.¹¹ Typical service attributes are measurable items such as waiting time and price, or items more challenging to quantify such as facility cleanliness or employee empathy. By describing a service in terms of appropriate attributes, DCA can be used to predict market share and profit from any hypothetical service design in a competitive environment. Discrete-choice experiments involve careful designs of service profiles (with specific levels of attributes) in choice sets in which two or more service profiles (alternatives) are offered to would-be customers. The respondents are asked to evaluate the options and choose one (or none). Each subject in a DCA experiment typically receives several choice sets to evaluate (e.g., 8 to 32 sets) with two or more hypothetical services to choose from in each of the sets.¹²

DCA applications based on choice experiments typically involve the following steps: (1) identification of attributes, (2) specification of attribute levels, (3) experimental design, (4) presentation of alternatives to respondents, and (5) estimation of choice model. A number of past studies have shown that, in general, the market-share predictions generated from multinomial-logit

¹¹See: Rohit Verma and Gary Thompson, "Basing Service Management on Customer Determinants: The Importance of Hot Pizza," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 37, No. 3 (June 1996), pp. 18-23; and M. Pullman and W. Moore, "Optimal Service Design: Integrating Marketing and Operations Perspectives for Capacity Decisions," *International Journal of Service Industry Management*, in press (1999).

¹²For a detailed theoretical and statistical background of DCA, see: M. Ben-Akiva and S.R. Lerman, *Discrete Choice Analysis* (Cambridge, MA: MIT Press, 1991); or D. McFadden, "The Choice Theory Approach to Market Research," *Marketing Science*, Vol. 5, No. 4 (1986), pp. 275-297.

(MNL) or more-advanced econometric models (e.g., nested-logit model) based on discrete-choice analysis are extremely accurate.¹³ Although design of choice experiments and estimation of MNL models require sophisticated training and skills, implementing the estimated model(s) in spreadsheet-based decision-support systems is fairly easy. Hence, DCA has become immensely useful for practicing managers. In this study we illustrate the use of DCA in service design for a multinational food-service market.

Food-service at O'Hare's International Terminal

We conducted a detailed case analysis of the food-court operations at Chicago's O'Hare, one of North America's largest and busiest international airport terminals. The information presented here is based on the operational data collected from the senior management team of the food-service operations at the terminal, the managers or owners of the individual food-service vendors, and customer-choice data collected from three different cultural groups during 1998.

We chose to conduct an in-depth analysis of the food-service operations at O'Hare for the following reasons. (1) Many people from a variety of nations and cultures pass through O'Hare or visit Chicago, so that a relatively large number of observations can be generated for each cultural group. (2) Because access to international airport terminals is restricted, customers are limited to choosing a food-service vendor from those at the terminal.

Hence, we had the opportunity to characterize the entire market environment, a situation we believe is unlike other potential study locations. (3) Potential customers were actually able to see all the food-service vendors at the same time. It is reasonable, therefore, to believe that the issues on which customers focus are marketing (brand name, price, promotion) and operations (waiting time, service variety, quality). (4) The flight schedule at O'Hare yields a reasonably predictable arrival pattern of different customer groups. This was beneficial for data collection and observing customers' choices. (5) The few food-service vendors were essentially fast-food operators. Consequently, the DCA could include a majority of service possibilities—again, an uncommon situation.

About revenues. One of the reasons that the terminal authority was interested in the success of its food-service vendors is that they are a source of revenue. Landing fees may not be a source of great revenue increases because the airport is already heavily subscribed, but commercial operations, particularly revenues derived from airport retailing, has provided significant revenue opportunities for operating authorities. While most major international terminals derive the majority of their revenues from duty-free retail operations, the second biggest source is revenues from food and beverage operations.¹⁴ Lease payments for the food court in question are based on a percentage of the vendors' sales. Thus, if our study finds ways to increase revenues, it not only could benefit the vendors themselves, but also airport-terminal operations.

One food-service vendor implemented our study's recommendations and enjoyed a substantial revenue gain over the previous year's same-period sales.

¹³ See: Ben-Akiva, *op. cit.*; P.E. Green and A.M. Krieger, "Individualized Hybrid Models for Conjoint Analysis," *Management Science*, Vol. 42, No. 6 (1996), pp. 850-867; and J.J. Louvière and H. Timmermans, "Stated Preference and Choice Model Applied to Recreation Research: A Review," *Leisure Sciences*, Vol. 12 (1990), pp. 9-32.

¹⁴ P. Freathy and F. O'Connell, "Supply-chain Relationships within Airport Retailing," *International Journal of Physical Distribution and Logistics Management*, Vol. 28, No. 6 (1998), pp. 451-462.

Exhibit 1

Restaurant attributes and levels

Attributes, levels, and (experimental design code)	Restaurant 1— "Burger"	Restaurant 2— "Pizza"	Restaurant 3— "Dogs"	Restaurant 4— "Deli"
Brand name				
Level 1 (-1)	Local chain	Local chain	Generic food items	Local chain
Level 2 (+1)	McDonald's	Pizza Hut or Domino's	La Prefreda or Goya	Subway or Boston Market
Variety				
Level 1 (-1)	Burger, fries, ice cream	Pizza	Hot dog, fries, nachos	Sandwich, soup, ice cream
Level 2 (0) (add to Level 1 items)	+ chicken nuggets and salads	+ lasagna, pasta	+ burritos, tacos	+ Udan noodle soup, salads
Level 3 (+1) (add to Level 1 & 2 items)	+ special burgers and sandwiches	+ salads, soups	+ tamales, enchiladas	+ sushi, simple Asian dishes
Wait to order				
Level 1 (-1)	0 to 2 minutes	0 to 2 minutes	0 to 2 minutes	0 to 2 minutes
Level 2 (0)	3 to 4 minutes	3 to 4 minutes	3 to 4 minutes	3 to 4 minutes
Level 3 (+1)	5 to 6 minutes	5 to 6 minutes	5 to 6 minutes	5 to 6 minutes
Service time				
Level 1 (-1)	0 to 2 minutes	0 to 2 minutes	0 to 2 minutes	0 to 2 minutes
Level 2 (0)	3 to 4 minutes	3 to 4 minutes	3 to 4 minutes	3 to 4 minutes
Level 3 (+1)	5 to 6 minutes	5 to 6 minutes	5 to 6 minutes	5 to 6 minutes
Menu language				
Level 1 (-1)	English	English	English	English
Level 2 (0)	English and Spanish	English and Spanish	English and Spanish	English and Spanish
Level 3 (+1)	English, Spanish, Japanese	English, Spanish, Japanese	English, Spanish, Japanese	English, Spanish, Japanese
Picture display				
Level 1 (-1)	No	No	No	No
Level 2 (+1)	Yes	Yes	Yes	Yes
Price (including drinks)				
Level 1 (-1)	\$4	\$4	\$4	\$4
Level 2 (0)	\$7	\$7	\$7	\$7
Level 3 (+1)	\$10	\$10	\$10	\$10

The Food Court

Four food-service companies, including McDonald's, are situated in a single food court on O'Hare's international-departure level. This particular terminal handles only international flights on non-domestic airlines. The regional breakdown of the departing airlines at that terminal is 20 percent Latin America, 10 percent Japan and Asia, 60 percent Europe, and 10 percent Middle East.

The design of food and beverage services for a multinational setting is challenging, due to cultural differences in the way people react to uncertainties and ambiguities inherent in daily living.¹⁵ Put simply, international travelers generally attempt to avoid uncertainty by choosing food from their respective cultures or from internationally

¹⁵ See: G. Hofstede, *Culture's Consequences* (Beverly Hills, CA: Sage Publications, 1980); and Lee and Ulgado, pp. 39-52.

recognized brand names.¹⁶ Other factors such as waiting time and prices for food have been shown to mean different things to different national groups. For example, a short waiting time and low prices for food are more generally impor-

¹⁶ See: Clark, pp. 66-79; T. Clark, D. Rajaratnam, and T. Smith, "Toward a Theory of International Services: Marketing Intangibles in a World of Nations," *Journal of International Marketing*, Vol. 4, No. 2 (1996), pp. 9-28; Jain, pp. 70-79; and Martenson, pp. 7-17.

tant for people from the United States than for people from some European and Asian cultures.¹⁷

Data collection. We conducted the customer-preferences survey with just three groups—those customers flying on airlines based in Latin America, Japan, and Europe—because they represented the majority of the customers at the international terminal's food-service operations. The survey was administered in the terminal's food court and waiting areas. All questionnaires and interviews were conducted in the respondent's language (English, Spanish, or Japanese) depending on the customer's preference. In this study, primary language represents a proxy for national culture.¹⁸

The first stage in the DCA study involved identification of relevant product and service attributes and those attributes' possible levels. For this we interviewed 100 randomly selected airline passengers to identify the important attributes they considered in choosing a food vendor. Based on their responses, we identified seven attributes that most potential customers considered when selecting a food vendor at this particular airport terminal. This kind of qualitative-data-collection approach for the identification of relevant service attributes has been recommended by other researchers.¹⁹ In fact, Griffin and Hauser concluded that it takes only as few as 30 respondents to get a majority of relevant product and service attributes. Considering that recommendation, we chose to collect qualitative data from a total of 100 customers representing our three market segments.

Decision Attributes

The selected service attributes were as follows:

- brand name (i.e., the restaurant is either part of a branded international chain or it sells branded food items),
- menu variety (i.e., the number of different food items served by a particular restaurant),
- wait time before ordering,
- service time, and
- price of a standard meal and drink.

Not all customers spoke, understood, or read English. To overcome language barriers, managers wanted us to consider communication-related attributes, and so we added menu language and picture display of popular meal items as the remaining two attributes.

Attribute levels. Next, we identified the relevant levels for each of the seven attributes selected for the study. The final attribute levels reflect realistic values that we selected after detailed discussions with terminal managers. Brand name, for example, was a two-level attribute (local chain versus national chain). On the other hand, menu variety had three levels, to reflect a low, medium, or large number of possible menu choices. The remainder of the attributes likewise had either two or three levels.

One of the considerations in this study is the limitations of space and legal and regulatory constraints that render it impossible for more than four vendors to operate in this particular food court. The airport's managers were exploring covering a broad menu spectrum with the four restaurants—those being burger, pizza and Italian, hot dogs and Mexican, and a deli concept (with an Asian adjunct). For our survey, these possible restaurants are referred to as "burger," "pizza," "dogs," and "deli." Exhibit 1 lists

the selected attribute levels for each of the four types of restaurants. Note that attribute levels for "brand name" and "variety" are different for each of the four concepts.

After identifying the attributes and their levels, we employed a fractional-factorial design to generate 18 experimental profiles for each restaurant concept.²⁰ A full experimental design would involve 486 possible profiles for each restaurant—and render the study impractical. Instead, fractional-factorial or partial-experimental designs reduce the respondent's task to a more manageable size by using only a sample group of all potential profiles found in design catalogues.²¹ The profiles contained different levels of each of the seven attributes described above. Each choice set contains one profile for each of the four types of restaurants.

As illustrated with the example in Exhibit 2 (on the next page), each respondent was asked to choose one out of the five possible choices (one of the four restaurants or none of them) for each of the 18 experimentally generated choice sets. Another part of the survey dealt with respondents' characteristics such as age, gender, family size, amount spent at food court, and items purchased.

Both the preliminary and final questionnaires were originally written in English, translated into Japanese and Spanish by two bilingual speakers, and (as a check of those translations) translated back into English by two different bilingual speakers, as per recommended

¹⁷ J.J. Louviere, *Analyzing Individual Decision Making: Metric Conjoint Analysis* (Newbury Park, CA: Sage Publications, 1988).

²⁰ For example, see: G.J. Hahn and S.S. Shapiro, "A Catalog and Computer Program for the Design and Analysis of Orthogonal Symmetric and Asymmetric Fractional Factorial Experiments" (Schenectady, NY: Technical Report Number 66-C-165, 1966). See also: R. McClean and V. Anderson, *Applied Factorial and Fractional Designs* (New York: Marcel Dekker, 1984).

¹⁷ See: L. Copeland and L. Griggs, *Going International* (New York: Random House, 1985); and E.T. Hall and M.R. Hall, *Understanding Cultural Differences* (Yarmouth, ME: Intercultural Press, 1990).

¹⁸ Hofstede, *op. cit.*

¹⁹ For example, see: A. Griffin and J.R. Hauser, "The Voice of the Customer," *Marketing Science*, Vol. 12, No. 1 (1993), pp. 1-27.

Exhibit 2
Choice Set 11 — a sample

	Restaurant 1	Restaurant 2	Restaurant 3	Restaurant 4	None
Brand name	McDonald's	Local restaurant	La Prefreda or Goya products	Subway or Boston Market	
Variety	Burger, fries, ice cream	Pizza, lasagna, pasta, salads, soups	Hot dogs, fries, nachos, burritos, tacos, tamales, enchiladas	Sandwich, soup, ice cream, Udan noodle soup, salads	
Wait time (before ordering)	5 to 6 minutes	0 to 2 minutes	3 to 4 minutes	0 to 2 minutes	
Service time	0 to 2 minutes	3 to 4 minutes	5 to 6 minutes	3 to 4 minutes	
Menu language	English	English, Spanish, and Japanese	English and Spanish	English and Spanish	
Picture display	Yes	No	No	No	
Price (meal & drinks)	\$4	\$4	\$10	\$7	
<i>I would purchase food from...</i>					

Exhibit 3
Respondents' profile

	Wait time in food court (min)	Cost per person	Eaters in party	Age (years)	Gender (% male)	Speak English	Speak Spanish	Speak Japanese
All N = 452	48.17	\$ 4.51	2.55	33.88	48%	77%	34%	20%
English n = 253	51.56	\$ 5.25	2.41	35.05	46%	100%	15%	3%
Spanish n = 117	33.42	\$ 3.74	3.00	29.45	50%	66%	100%	0
Japanese n = 82	70.87	\$ 3.02	2.41	36.80	49%	24%	0	100%

methods.²² The final survey instrument was administered in the three languages (English, Japanese, and Spanish) to approximately 500 travelers from June through October 1998. Of those questionnaires, 452 were usable (90-percent response).

Customer-choice Models

As Exhibit 3 indicates, the respondents' demographic profiles show a number of differences among the groups. The English group spent the most money per person, while the Japanese spent the least. (Remember, these are language groups and not necessarily nationalities.) The Spanish group spent below average per person, but bought food for more people than the other two

²² See: R. W. Brislin, "Back Translation for Cross-cultural Research," *Journal of Cross-cultural Psychology*, Vol. 1 (1970), pp. 185-216; and H.C. Triandis, "Methodological Problems of Comparative Research," *International Journal of Psychology*, Vol. 11, No. 3 (1976).

groups. The Japanese group spent the most time waiting in the food court, while the Spanish group spent the least.

Next, the MNL models developed for each of the three customer groups (English, Japanese, and Spanish) are shown in Exhibit 4. One can look at the relative intercept values to get a general idea of how the group felt about each of the four restaurant concepts. To interpret the attribute information, we first look at the possible values that an attribute can have and multiply a possible value by its corresponding weight. We then sum these products over all the attributes. The resulting sum is a utility or overall preference that the group of customers or a market has for a given restaurant concept. Higher utilities mean a higher probability that customers will prefer a particular service alternative.

Looking at the goodness-of-fit statistics for the three MNL models, the high r^2 and adjusted r^2 values demonstrate a strong fit between the estimated model and observed empirical data.²³

English-speaking Segment

Interpreting the model for the English-speaking group, we see that the deli and pizza concepts are most popular. Brand names have relatively poor strength; La Prefreda and Goya (dogs) has the most negative perception followed by Subway and Boston Market (deli), and McDonald's (burger). Pizza Hut and Domino's (pizza) were the only brands with

²³ See: Ben-Akiva and Lerman, *op. cit.* The r^2 values are: 0.67, 0.71, and 0.62. Please note that although it is possible to identify the general preference trends for MNL choice models, it is not appropriate to directly compare the β coefficients for two models. The recommended statistical test for equality of MNL model parameters is based on a χ^2 statistic and was developed by: J. Swait and J.J. Louviere, "The Role of the Scale Parameter in the Estimation and Comparison of Multinomial Logit Models," *Journal of Marketing Research*, Vol. 30 (1993), pp. 305-314.

Exhibit 4
Estimated multinomial logit-choice models

Variables	English	Spanish	Japanese
Intercepts:			
Burger	0.7009 *	2.1472 *	1.0843 *
Pizza	0.8630 *	1.5594 *	0.2872 *
Dogs	0.2180 *	1.2289 *	-0.3996 *
Deli	1.2732 *	1.4811 *	1.1170 *
Brand name			
Burger	-0.0923	-0.1104	-0.1201
Pizza	0.1210 *	-0.1112	0.0683
Dogs	-0.2081 *	-0.3951 *	0.0987
Deli	-0.1353 *	0.1740 *	-0.0280
Variety			
Burger	0.2699 *	0.1059	0.2296 *
Pizza	0.1424 *	0.0996	0.1152
Dogs	0.0677	0.3382 *	-0.4051 *
Deli	0.0435	-0.0576	0.4295 *
Wait to order			
Burger	-0.1758 *	-0.7420 *	-0.1496 *
Pizza	-0.2215 *	-0.1090	-0.0854
Dogs	-0.3152 *	0.1902	0.0126
Deli	0.0653	0.1038	0.0050
Service wait			
Burger	-0.2471 *	-0.0800	-0.1182
Pizza	-0.0306	0.0268	-0.0914
Dogs	0.1347 *	-0.2026 *	-0.1590 *
Deli	-0.1110 *	-0.0081	-0.1108
Menu language			
Burger	-0.4804 *	-0.8713 *	-1.0102 *
Pizza	-0.5590 *	-0.9151 *	-0.8342 *
Dogs	-0.8267 *	-1.1485 *	-0.9787 *
Deli	-0.4810 *	-0.7424 *	-0.7849 *
Price (meal + drinks)			
Burger	0.0995	0.3242 *	0.2128 *
Pizza	-0.0362	0.1468	-0.0405
Dogs	0.0975	0.3180 *	0.2735 *
Deli	-0.0697	0.2852 *	0.1812 *
Picture display of items			
Burger	-0.1091 *	-0.1078	0.1709 *
Pizza	-0.0151	-0.0560	0.0306
Dogs	0.0314	-0.2240 *	0.2415 *
Deli	0.0680	0.1739 *	0.0609
Goodness-of-fit statistics			
McFadden's r^2	0.7154	0.7509	0.6855
Adj. McFadden's r^2	0.6738	0.7090	0.6271

* Statistically significant at the 5-percent level.

Note: The intercepts category shows the utility of each restaurant concept with respect to the alternatives—provided that everything else remains constant. For example, if everything else remained equal, the English-speaking customers are most likely to choose deli followed by pizza, burger, and dogs.

Exhibit 5 Suggested strategy changes

Pizza	Dogs	Deli
Local branding	Local branding	Local branding
Increase to high variety	Increase to high variety	Increase to high variety
Improve order waits to 0 to 2 minutes	Improve order waits to 0 to 2 minutes	Maintain or increase order waits to 5 to 6 minutes
Reduce preparation time to 0 to 2 minutes	Maintain existing preparation time	Reduce preparation time to 0 to 2 minutes
English-only menu	English-only menu	English-only menu
No pictures	Keep picture displays	Add picture displays
Increase average price	Increase average price	Increase average price
Share change: +9.72%	Share change: +9.53%	Share change: +13.70%

Note: Share changes assume that competitors do not change their concepts.

favorable scores. Variety is important to these travelers, and a customer's preference for the restaurant increases as the menu variety increases. Adding variety to the burger concept (special burgers and sandwiches) and to the pizza menu (pasta, salad, and soups) created the most favorable preferences. Third, shorter wait times for burgers and pizza generate an increase in the customer's preference for those vendors. The English speakers were not impressed by a lengthy wait to order at the dogs counter but viewed a longer service time favorably. The deli needs a brief wait for service, and people were comfortable with that wait to order. Fourth, this segment was happy with an English menu, but their preference for a vendor decreases greatly as more languages are added to the menu. Pictures on the menu returned mixed results: this group doesn't need pictures of burgers or pizza, but did like pictures of dogs and deli items. Finally, reducing prices has negligible impact on the group.

Spanish-speaking Segment

Spanish speakers by far preferred the burger concept over the other three. However, only the deli-related brand

names, Subway and Boston Market, have a positive effect on preference for the vendor. Second, increasing variety is viewed favorably in all cases except at the deli (which involved adding more Asian food items). Not surprisingly, adding Mexican items to the dogs menu was extremely popular with this group. Third, longer waiting time hurt all vendors except in two instances. Respondents viewed increased order waiting time favorably at dogs and deli. Fourth, the addition of Spanish- or Japanese-language menus is viewed negatively. Pictures of the food only benefits the deli positively. Finally, this group was not price sensitive.

Japanese-speaking Segment

From the Japanese customers' perspective, the burger and deli are the most popular concepts. This group views brand names positively for pizza (Pizza Hut or Domino's) and for dogs (La Prefreda or Goya Products), but not so for the other vendors. Increasing variety is favorable for all vendors except dogs (which involves an increase in Latino food items) and is extremely favorable for deli (which involves increasing Asian food items). Similar to the

Spanish group, increased waits are viewed negatively except waiting to order for dogs and deli. Although multilingual menus are undesirable for the Japanese speakers, they appreciate pictures of food. We found them to be price sensitive for the pizza concept only.

Preference Differences by Concept

The burger concept was most popular with the Spanish group and least popular with the English group. All groups shared negative feelings about a burger brand name, long waits (in all concepts), and multilingual menus. They shared positive feelings about increasing menu variety. The three groups' preferences diverged on price, food items, and food pictures. While the Japanese and Spanish customers were not price sensitive, the English group generally preferred lower prices. On the other hand, the English and Spanish groups did not want pictures of the food, while the Japanese did.

Sampling pizza. The groups differed on their perception of the pizza concept. The Japanese and English groups preferred a brand-name operator to the local vendor, but the Spanish group felt negatively about a brand-name product. Regarding long waits, the English and Spanish groups felt more negative about the wait to order than about waiting for service. The Japanese group did not differentiate between the two waits. None of the groups wanted multilingual menus for pizza. For this concept, both the English and Japanese groups were price sensitive, while the Spanish group was not.

In the doghouse. The dog concept was the least-popular concept for all groups. Incorporating brand-name food items was viewed negatively by the English and Spanish groups, but positively by the Japanese group. Increasing variety by adding Mexican food items was

greatly preferred by the Spanish group and preferred slightly by the English speakers, but that was viewed negatively by the Japanese group. The English group did not like long waits to order dogs, while the Japanese and Spanish were willing to wait. On the other hand, the English group felt more positive about the service wait than their counterparts. Once again, multilingual menus were universally disliked, while food pictures were preferred by only the Japanese and English groups. All the groups showed price insensitivity towards the dogs concept.

Next, please. The deli concept was most popular with the English respondents. Neither the Japanese nor English preferred a brand-name deli, although the Spanish group did. The Japanese group showed a strong preference for increasing menu variety by adding Asian items. The English group preferred some variety of this type, but the Spanish group disliked that increased variety. None of the groups was sensitive about waiting to order, but all disliked increased service wait. Again, none of the groups wanted multilingual menus, but did want food pictures. Finally, of the three groups, only the English group was price sensitive to this concept.

Strategy Implications

Given the above models for each group and food-service concept, we next look at what each vendor could do to improve its market share. We determined the composition of the food-court market by converting customer-traffic estimates from O'Hare's schedules into forecasts for food-court customers. Based on that analysis we posit that the international terminal's market comprises 60 percent persons from English-speaking destinations, 25 percent from Spanish destinations, and 15 percent from Japanese locations. According to our models, the

burger concept receives most of the Japanese and Spanish market share. For the following analysis, we have left the McDonald's attributes at their existing levels and changed each vendor in isolation of the other vendors. That is, we tested the model as though one vendor could change its features without any changes by the others. We then set each vendor at its maximum market-share configuration and looked at the overall impact.

Exhibit 5 shows market share that results from maximizing changes for each of the three vendors other than McDonald's. For example, if the pizza outlet changed without competitors retaliating, it would gain 9.7-percent market share. On the other hand, if competitors all change then the pizza place gains only 1.8 percent in overall share. The biggest positive changes to pizza come from increasing the variety to include pastas and salads and reducing the overall wait time (to order and deliver food). In that case, pizza gains share from the English and Spanish groups but loses share from the Japanese group.

Similarly, the biggest positive changes to the dogs concept come from increasing the variety to include more Mexican food items and reducing the wait time to order. With those changes, dogs gains 9.53-percent share (in the absence of other vendors' changes) and gains 2.57 percent, if all change. These changes are reflected positively with a large shift from the Spanish group, followed by the English group. As we indicated above, those changes are negative for the Japanese group.

Adding Asian foods to the deli's menu, reducing waiting time for service, and adding pictures of food contribute to the largest market-share improvements (6.25 percent overall, even when all vendors change). For all groups, increasing the average price is not viewed detrimentally by the customers. By

All groups shared negative feelings about long waits and multilingual menus. They shared positive feelings about increasing menu variety.

Exhibit 6

Impact of different operations strategies (hypothetical)

Companies and (primary operations strategy)		Burger (fast service)	Pizza (high quality)	Dogs (low cost)	Deli (high variety)
Intercepts:	Burger	1			
	Pizza		1		
	Dogs			1	
	Deli				1
Brand name	Burger	-1			
	Pizza		1		
	Dogs			-1	
	Deli				-1
Variety	Burger	-1			
	Pizza		0		
	Dogs			-1	
	Deli				1
Wait to order	Burger	-1			
	Pizza		0		
	Dogs			1	
	Deli				0
Service wait	Burger	-1			
	Pizza		0		
	Dogs			0	
	Deli				0
Menu language	Burger	-1			
	Pizza		1		
	Dogs			-1	
	Deli				1
Price (meal and drinks)	Burger	0			
	Pizza		1		
	Dogs			-1	
	Deli				0
Picture display of items	Burger	1			
	Pizza		1		
	Dogs			-1	
	Deli				1
Estimated Market Share (%)	English	32.74	15.32	22.13	29.81
	Spanish	71.91	3.20	21.51	3.38
	Japanese	71.85	3.91	9.34	14.90

The table shows the expected market share for four competitors given the following strategic changes: burger gives fast service, pizza adds high perceived quality, dogs goes for the low-cost market, and the deli promotes high menu variety.

Note: The rows at the bottom of the table give the expected share of each restaurant concept for each market for the various attribute levels that were tested. The design codes relating to -1, 0, and 1 are given in Exhibit 1. For example "-1" for brand means "local brand," while "+1" means "national brand." Similarly, "-1" for picture display means no pictures are displayed, and "+1" means they are. For further explanation of this methodology, see: Rohit Verma and Gary Thompson, "Basing Service Management on Customer Determinants: The Importance of Hot Pizza," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 37, No. 3 (June 1996), pp. 18-23.

adding specialty Asian foods and picture displays, the deli gains a large portion of the Japanese group, and those changes are viewed favorably by the other two groups also.

A scenario. Exhibit 6 presents a hypothetical scenario of the impact of different operations' strategies in a given market environment. This example is presented for the sake of illustration only and does not correspond to any actual company operating at the international terminal. The purpose of this example is to demonstrate how MNL choice models can be used to position a service firm's operations according to the preferences of one or more market segments. The table shows the expected market share for four competitors given the following strategic changes: burger gives fast service, pizza adds high perceived quality, dogs goes for the low-cost market, and the deli promotes high menu variety. The calculations show that each firm can expect different market shares in the three markets. Burger's fast-service strategy is favored by each of the three customer groups, but that outlet can expect only a 33-percent share of the English-speaking market, while it receives approximately 72-percent shares of Spanish and Japanese travelers. On the other hand, both pizza (with its high-quality approach) and the deli (offering high variety) are expected to gain a much higher share of the English-speaking market compared to the other two groups. Dogs expect to gain approximately equal share in English and Spanish markets and a much lower share in the Japanese markets.

Differences in Perceptions

Our study shows significant differences in the perceptions of the three cultural customer segments that we studied. Given the current mix of the three groups, we proposed changes to each service design and demonstrated the likely impact of

operating-strategy changes. In all cases, the groups want more variety, and it is no surprise that they particularly want more foods with which they are familiar. Context-specific attributes such as waiting for a whole pizza (an item that requires more preparation time than the other categories) or desiring pictures of unfamiliar foods depended on the service concept and the customer group's familiarity with that concept. Using the DCA method, we were able to model the preference trade-off among groups and determine improvements that would improve the overall market share for all the vendors in the food court.

From the descriptive results (Exhibit 3), it appears that the Japanese group spent the most time in the food court but spent the least per capita. The Spanish group spent the least time in the food court and spent below-average amounts on each person, but they had the largest party size. Thus the vendors had an opportunity to increase sales to each of these groups. In this competitive environment it made sense for some vendors to customize their food offerings for different customer groups. For example, the dogs vendor could add the Mexican food items we had proposed to appeal to Spanish-speaking customers, and the deli vendor could add the Asian food items to appeal to the Japanese-speaking customers. Those variety additions generally had at least some cross-cultural appeal. While that variety increase may appear to add to the complexity of service delivery, those two vendors could take advantage of the departure-time windows for Japanese and Spanish travelers. Owing to airline schedules, the majority of the Japanese travelers are in the food court between 8 AM and 12 noon, while Spanish groups tend to patronize the food court from 8 PM to 12 midnight. Thus, vendors could modify their menus for those hours

of the day only, both of which are off-peak times for most other travelers.

From an operations-management perspective, the challenge is to modify process attributes, such as time spent waiting to order and to receive the order (usually preparation time). In most cases, the different groups had similar preferences for waiting times, but there were some exceptions, particularly for the dog and deli concepts. For those concepts the groups had different expectations regarding how long they should have to wait to order and wait for preparation. We can only speculate that some customers expect to wait longer when menu variety increases or the concept is not expressly labeled quick service.

For this relatively straightforward service setting, none of the groups wanted multilingual menus, but in some cases the groups wanted food pictures. The Japanese group wanted pictures for all menus, the Spanish group wanted pictures only for the deli (particularly as variety increased with the addition of Asian foods), and the English group wanted pictures for both the dogs (again as variety increased with the addition of Mexican foods) and deli. We conclude, then, that each group wants pictures of foods with which they may be unfamiliar as variety expands.

Phased Implementation

The O'Hare Authority planned to implement the results of this study in several phases. The first phase was the modification of dogs, by adding Mexican food items to the menu at night from 8:00 to midnight while at the same time reducing waiting times by improving process and labor-scheduling efficiencies. At the time of this report, the modifications had been in effect for three months. During this period, the vendor increased sales by 50 percent from the previous year (while pas-

senger departures at the terminal remained essentially constant). Our study looked only at the possibilities of shifting shares among the existing four vendors, and we did not estimate the effects of drawing new customers from the population that were previously non-purchasers. Yet that is exactly what must have occurred, for sales greatly exceeded our projections. In this case, it appears that research aimed at maximizing market share is a worthy objective for each food-court vendor given its substantial effect of attracting new customers.

Looking Ahead

This study looked at the effects on market share of catering to different cultural groups in a specific service setting. Future research is needed to determine the cost and benefits of customizing certain portions of a service versus making a standard service offering. It has long been established that certain market segments generate more revenue than others (regardless of how the segments are determined). Moreover, seeking to please all market segments at once will probably add too much complexity and cost.²⁴

While this study examined food service, other service industries could benefit from market analysis using the DCA approach. To summarize, we have presented an approach for positioning a service and formulating operations strategy in a multicultural environment. The case analysis at the international terminal's food-service operations demonstrates the value of DCA and market-utility models in service environments. We hope that other research teams will undertake similar projects to analyze interdisciplinary issues related to service operations strategy formulation. **□**

²⁴ For a discussion of the cost and revenue outcomes of adding complexity to a service operation, see Enz, Potter, and Siguaw, on pp. 54-62 of this *Cornell Quarterly*.