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Restaurant Revenue Management

by Sheryl Kimes, Ph.D.

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by Sheryl E. Kimes

THE PRINCIPLES OF REVENUE MANAGEMENT CAN BE APPLIED TO RESTAURANTS, given that the restaurant's unit of sale is the time it takes for a complete meal cycle, rather than just the meal itself. Moreover, restaurants have classic characteristics that invite revenue-management strategies (those characteristics being relatively fixed capacity, perishable inventory, a demand inventory, time-variable demand, appropriate cost structure, and segmentable customers). When a restaurant's operation is gauged by the time-related measure called revenue per available seat-hour, or RevPASH, managers can analyze operations and menus to improve that statistic. Using RevPASH allows managers to capture more of the restaurant's actual performance in their analysis than does average check or typical food- or labor-cost percentages.

Restaurateurs have available two general sets of strategic levers to build RevPASH, which is the goal of restaurant revenue management. Those key levers are duration management and demand-based pricing. Pricing approaches involve setting prices according to customers' demand characteristics, such as whether they are willing to dine off peak or whether they are not as concerned about price as they are about the dining experience. Pricing strategies must be approached carefully to avoid the appearance that the restaurant seeks to gain at the expense of customers (which customers view as unfair). Typically, this means adjusting menus to offer discounts and specials that, while they offer more value to the customer, may well make as strong a contribution to revenue as other, higher-price menu items that cost more to serve. That is the province of menu engineering.

Duration management helps restaurateurs gain control of the most erratic aspect of their operation, which is the length of time customers sit at a table (including the rate at which customers will arrive to occupy that table). Among the tactics available for duration management are reducing the uncertainty of arrival, reducing the uncertainty of duration, and reducing the time between meals. Whether the restaurant accepts reservations or serves customers as they arrive, its manager needs to have a sense of when customers are most likely to appear. That is a matter of creating a forecast based on the restaurant's history and of carefully managing reservations (if the restaurant accepts them). Although a restaurateur cannot directly control the customer's use of a table, careful process control and analysis can make the restaurant's operations (including menu design, kitchen operation, and service procedures) as effective as possible for moving the meal along, and perhaps indicating to the customer when it is time to leave.

As an example, Chevys Arrowhead, a Phoenix-area restaurant, used revenue-management levers to improve its revenue through process control. Seeking to augment revenue and also to improve customer service, the restaurant analyzed its operations and its customers' characteristics. It found that its table mix (mostly 4-tops) was inappropriate for its customer base (mostly singletons and couples). It also found that it could tighten up its post-meal procedures, particularly those involving settlement. The restaurant was reconfigured, servers were retrained, and certain key positions were added. The result was an increase in revenue (from higher occupancy) that paid for the increased capital costs in one year. The revenue improvement in this instance was to guests' advantage, since menu prices were not changed as part of this revenue-management implementation.

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RESEARCH IN REVENUE MANAGEMENT has traditionally addressed the theoretical and practical strategic problems facing airlines and hotels, among other industries, but it has given little consideration to the restaurant industry. The restaurant business is similar enough to hotel and airline operations that restaurants should be able to apply revenue-management-type practices in a strategic fashion, but the applications have so far been mostly tactical. A broad theory of revenue management would permit restaurant operators to gain the benefits of strategic revenue management that they currently lack.

My objective in this report is to develop a framework for such a theory and to discuss and demonstrate how that theory can work in practice. After reviewing the necessary conditions for revenue management, the strategic levers available for revenue management, I will explain how those strategic levers, along with some tactical tools, can be applied to restaurants.

Defining Revenue Management

Revenue management is the application of information systems and pricing strategies to allocate the right capacity to the right customer at the right place at the right time.[1] In practice, revenue management has meant determining pricing according to predicted demand levels so that price-sensitive customers can achieve a favorable price by purchasing at off-peak times, while price-insensitive customers will be able to make their purchases at the peak times that they desire. The application of revenue management has been most effective when it is applied to operations that have the following characteristics: relatively fixed capacity, perishable inventory, a demand inventory, time-variable demand, appropriate cost structure, and segmentable customers.[2] As I explain next, these attributes are generally found in some form or another in the restaurant industry.

Relatively fixed capacity. A restaurant's capacity can be measured by number of seats, kitchen size, menu items, or staffing levels. Most restaurant operators' approaches to optimizing revenue primarily involve filling the seats to capacity and turning tables as quickly as possible, but that effort can be limited by the kitchen, the menu design, or staff members' capabilities.

[1] B.A. Smith, J.F. Leimkuhler, and R.M. Darrow, "Yield Management at American Airlines," *Interfaces*, Vol. 22, No. 1 (1992), pp. 8–31.

[2] S.E. Kimes, R.B. Chase, S. Choi, E.N. Ngonzi, and P.Y. Lee, "Restaurant Revenue Management," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 39, No. 3 (June 1998), pp. 32–39.

Seating capacity is generally fixed over the short term, although restaurants have some flexibility to crowd a table with an additional seat if necessary, and the restaurant's cost of adding additional capacity in the forms of tables or seats (say, by reconfiguring the dining room or seating diners in the lounge) is lower than that of many businesses that typically use revenue management. Most restaurants have a fixed number of tables, but can vary the number of seats depending on the mix of party sizes. In addition, some restaurants might increase capacity during pleasant weather by using outdoor dining.

Perishable inventory. One might think of a restaurant's inventory as being its supply of raw food, but most of that is not perishable until it is removed from the freezer or is sitting on the receiving dock. Instead, a restaurant's inventory is best thought of as time—or, in this case, the time during which a seat or table is available. If a seat is not occupied for a period of time, that part of the restaurant's inventory perishes. This is the key to the strategic framework that I present here, and it is the element that I believe has been missing in most approaches to restaurant revenue management. Instead of counting table turns or revenue for a given day part, restaurant operators should measure revenue per available seat hour (RevPASH). This measure captures the time factor involved in restaurant seating.

Demand inventory. Demand can be inventoried either by taking reservations or by creating queues of waiting guests. Most industries that employ revenue management use reservations (or advance sales) to create a demand inventory. Reservations are valuable because they give an operator the opportunity to sell and control his or her inventory in advance of consumption (often with advance payment for that consumption). In addition, companies that take reservations have the option to accept or reject reservation requests. During high-demand periods, operators may choose to reject low-value requests, for instance, while during low-demand periods, managers may choose to accept such requests.

While many restaurants take reservations, a majority of restaurants do not do so, preferring instead to manage a queue when demand exceeds supply. Indeed, while reservations help a restaurant sell and control its inventory, they are not without problems. As I discuss later, no-shows, late-shows, and short-shows are all problems in the restaurant industry, which is why some restaurants choose to rely on walk-in business rather than take reservations.

Time-variable demand. Setting aside carry-out activities as a separate business, restaurant demand consists of guests who make reservations and guests who walk in. Both forms of demand can be managed, albeit with different strategies. Strategic differences notwithstanding, guests who make reservations and those who walk in constitute an inventory from which managers can select the most profitable mix of customers. To do this, however, restaurant operators must forecast customer demand and manage the revenue generated from that demand.

Restaurant demand has two components: namely, the timing of the demand and the duration of that demand (that is, how long the meal lasts). As in most businesses, customer demand varies by time of year, day of week, and time of day. For restaurants, dinner demand may be higher on weekends, during summer months, or at particular times during the lunch or dinner periods. Restaurant operators must be able to forecast time-related demand so that they can make effective pricing and table-allocation decisions.

A special factor for restaurant operators is that they have to reckon with the length of time a party stays once it is seated.

This factor is analogous to a hotel's having to forecast the number of guests who will stay an additional (unscheduled) night, but the hotel still is selling an integral room-night to the stayover guest and not dealing with the often-unpredictable period that diners will stay at a table. If restaurant managers can accurately predict meal duration, they can make better reservation decisions and give better estimates of waiting times for walk-in guests.

Appropriate cost structure. Like hotels, restaurants have a cost structure that features relatively high fixed costs and fairly low variable costs, although it's true that a menu item's food-cost percentage is usually higher than the variable-cost percentage associated with a hotel room. Like hotels, restaurants must generate sufficient revenue from each sale to cover variable costs and offset at least some fixed costs. Nevertheless, restaurants' relatively low variable costs allow for some pricing flexibility and give operators the option of reducing prices during low-demand times.

Segmentable customers. Like hotels, restaurants have some customers who are price sensitive and others who are not. For example, certain customers (for instance, students, families with small children, or people on fixed incomes) may be willing to change their dining time in exchange for a discounted price. Conversely, other customers are not at all price sensitive and are often willing to pay a premium for a desirable table at a desirable time. Restaurant operators need to be able to identify these two segments and design and price services to differentiate them and meet their needs.

Measuring Success: The Case for RevPASH

Restaurant managers are typically evaluated by such measures as the check average and the food- and-labor-cost percentage that the manager has been able to achieve.[3] Neither of those measures captures sufficient information about a restaurant's revenue-generating performance.

Having a restaurant manager concentrate only on a high average check, for instance, is equivalent to a hotel's focusing solely on achieving a high average room rate. Just as ADR omits consideration of occupancy, a restaurant's revenue performance cannot be evaluated without information on seat occupancy. A high average check may even be an indication of detrimental practices in times of strong demand if, for example, customers are encouraged to linger over their meal with coffee and dessert while other parties wait for a table.

Similarly, a manager's achieving specified food-cost and labor-cost percentages is laudable, but that does not tell the entire story. In particular, the margin is not a measure of profitable use of a restaurant's capacity. A restaurant manager can do a good job of maintaining margins and still be unprofitable, especially since an overemphasis on margins can lead to a propensity to focus unduly on minimizing costs. Again, reducing cost is fine, but not when that causes reduced revenue due to disgruntled customers.

The extent to which available seats are occupied is another commonly applied measure of success, since a busy restaurant is generally a revenue-producing restaurant. Relying on seat occupancy as a measure of success suffers from problems similar to those of relying on hotel-room occupancy (in the absence of consideration of ADR), because high use does not necessarily mean high revenue. A restaurant can run at 90-percent of capacity and still not make money if menu items are sold at too low a price, for example, or, more generally, if check averages are too low.

[3] Much of this section comes from S.E. Kimes, "Implementing Restaurant Revenue Management: A Five-step Approach," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 40, No. 3 (1999), pp. 16–21.

Exhibit 1
Sample calculations of RevPASH

Restaurant	*Seat occupancy*	*Average check (per person)*	*RevPASH*
A	40%	$18.00	$7.20
B	60%	$12.00	$7.20
C	80%	$9.00	$7.20
D	90%	$8.00	$7.20

Note: Mean dining times are assumed to be one hour in all cases.

Because it embraces capacity use and check averages, revenue per available seat-hour (RevPASH) is a much better indicator of the revenue-generating performance of a restaurant than are the commonly used measures that I just discussed. RevPASH indicates the rate at which revenue is generated and captures the trade-off between average check and facility use. If occupancy percentage increases even as the average check decreases, for instance, a restaurant can still achieve the same RevPASH. Conversely, if a restaurant can increase the average check, it can maintain a similar RevPASH with slightly lower seat occupancy.

Exhibit 1 gives an illustration of this principle. The four hypothetical restaurants in the exhibit all have the same RevPASH for the hour in question ($7.20), but each achieves it in a different manner. Restaurant A has a seat occupancy of 40 percent and an average check of $18, while Restaurant D has a seat occupancy of 90 percent but an average check of $8. Restaurants B and C also achieved a RevPASH of $7.20, but with varying seat occupancy and average-check statistics.

The easiest way to calculate RevPASH is to divide revenue (or profit) for the desired time period (e.g., hour, day-part, day) by the number of seat-hours available during that interval. For example, assume that a 100-seat restaurant makes $3,000 on Fridays between 6:00 and 8:00 PM. Its RevPASH for those hours would be $15 ($3,000/100 seats/2 hours).

Managing Demand: Strategic Levers

Restaurants appear to possess the conditions necessary for revenue management, but there is little evidence that most restaurants use a strategic approach for applying demand-management mechanisms.[4] A successful revenue-management strategy is predicated on effective control of customer demand. I have alluded to the two strategic levers that restaurant managers have at hand to manage demand, and thus, revenue. Those are duration management and demand-based pricing.

Duration management. As I mentioned above, restaurant operators typically face an unpredictable duration of customer use, which inhibits their ability to manage revenue. To allow for better revenue-management opportunities, restaurant managers must increase their control over the length of time that customers occupy their seats. To do this, restaurateurs can refine the definition of duration, reduce the uncertainty of arrival, reduce the uncertainty of duration, or reduce the amount of time between customers' meals (see Exhibit 2).

Redefining duration. The length of time that guests use a table is usually measured by the number of minutes or hours that they actually occupy that table or by the events relating to a meal (e.g., by the course or by the full meal). In either case, the restaurateur must know how long a typical guest will stay at a table in a given day part or meal. When duration is defined in terms of

[4] S.E. Kimes and R.B. Chase, "The Strategic Levers of Yield Management," *Journal of Service Research*, Vol. 1, No. 2 (1998), pp. 156–166; Kimes *et al.*, *op. cit.*

Exhibit 2
Methods of managing duration

Uncertainty of arrival	Uncertainty of duration
Internal measures	**Internal measures**
Reservations policies Arrival management Optimal table mix	Changes in the service delivery system Labor scheduling Menu design Communication systems
External measures	**External measures**
Deposits Guaranteed reservations Reconfirmed reservations	Pre-bussing Visual signals Coffee and dessert bar Check delivery

a meal rather than as the time to complete a meal, the operator must be able to predict meal length so that selling a meal essentially becomes selling a certain length of time.

On the surface, restaurants sell meals, rather than explicitly selling time—although a few restaurants actually do sell blocks of time (e.g., seating parties every two hours, with a reminder to leave when the time is up). In reality, restaurant operators sell time in the form of meals of reasonably predictable length. This could be done directly, in theory, by asking customers how long they will need the table when they make a reservation or request a table, but such an approach would require a radical change in thinking for both restaurateurs and customers. Even though that approach would explicitly change the definition of duration from the meal itself to the time involved in eating the meal, the tactic would put off most guests—other than those who have a specific date or appointment after the meal.

Instead, most restaurant operators must keep track of the length of time that guests occupy a table during given day parts. From these observations, the restaurateur could determine an average meal length, while also noting the extent of variations in meal length. That is, the restaurant operator needs to know the average length of a meal, plus how close to the average most diners come. Wide variation of meal lengths (known as a high standard deviation) makes forecasting more difficult and perhaps calls for management efforts to make the duration more consistent.

Uncertainty of Arrival

Arrival uncertainty can be reduced through reservation and arrival-management policies and by developing and implementing an optimal table mix. The key to reducing arrival uncertainty is to understand the timing and volume of customer arrivals. This information can be used to develop forecasts

that can assist with the establishment of good reservations and walk-in policies and with developing an optimal table mix.

Reservation Policies

As I said earlier, restaurants that take reservations must contend with possible no-shows, short-shows, or late-shows, while operators who do not take reservations must predict how many guests will arrive and when they will do so. Given a choice, a no-reservation policy is probably preferable, but in many situations, particularly in fine-dining restaurants, customers expect to be able to make a reservation, so accepting reservations is often a market necessity.

Given the choice, a no-reservation policy might be best, but that's not always possible.

Most reservations are made directly with the restaurant, although on-line reservations are increasingly being made (e.g., opentable.com, iseatz.com). If a restaurant takes reservations, its managers must decide on the number of tables to allocate to each time slot and determine the desired interval between reservations. The number and size of tables to allocate to each time slot depends on the mix of walk-in and reservation business and on staffing levels. Little research exists on the optimal number of tables to allocate to each time slot, but the focus should be on spreading demand throughout the meal period, and if possible, shifting demand to off-peak periods (see below for a more detailed discussion of demand shifting). The desired interval between reservations will be dictated according to the expected meal duration by party size.

When customers call the restaurant for a reservation, they risk the possibility of calling during hours the restaurant is closed or of reaching someone who is not knowledgeable in how to take a reservation. Restaurants handle this problem in two ways: **(1)** dedicated reservation agents and **(2)** on-line reservations.

Dedicated reservation agents not only reduce the load on other staff members who might respond to reservation calls, but also provide increased accessibility and consistency. Obviously, retaining dedicated reservation agents may be cost prohibitive for small operations, but may be quite worthwhile for high-volume restaurants.

On-line reservations provide complete accessibility, consistent service, and an enhanced reach at a minor cost—approximately $1 per person seated. While this cost may seem high to some operators, the cost is relatively low, given that the labor costs associated with reservation agents can be reduced and the restaurant can have increased exposure to a potentially larger market.

Reservations are not without problems. The fact that a customer makes a reservation does not ensure that the customer will honor that reservation. Even if the customer shows up, there is no assurance that the customer will arrive on time or with the promised number of customers. Because reservations are unpredictable, they must be managed—either internally (with techniques not involving customers) or externally (involving customers). The primary internal approach is overbooking, while external methods include requiring deposits, guarantees, and the reconfirmation of reservations.

No-shows. The primary internal approach to handling no-shows is overbooking, a technique used by most capacity-constrained service industries. Restaurants have typically not used overbooking to offset no-shows, but have instead relied on walk-in business as a buffer—although this strategy works only if enough walk-ins arrive at the right time.

The key to a successful overbooking policy is to obtain accurate information on no-shows, cancellations, and walk-in guests so that managers can set levels of overbooking that maintain an acceptable level of customer service. A manager can use simple mathematical models to develop appropriate overbooking policies by time of year, day of week, and time of day. A good overbooking policy balances the cost of unused tables with the cost of inconveniencing or displacing a party—bearing in mind that a guest denied a reserved table may not be especially forgiving. Along that line, restaurants that use overbooking must develop good internal methods for selecting and handling displaced guests. Operators in other industries base their displacement decision on time of arrival (if customers are late, their reservation is no longer honored), frequency of use (regular customers are never displaced), or perceived importance (important, high-spending customers are never displaced).

As I indicated above, requiring credit-card guarantees and deposits are external approaches to reservation management, as is calling customers to reconfirm reservations. Restaurants have long required a deposit for special meals (e.g., Mother's Day, New Year's Eve), although the practice may meet with customer resistance during low-demand periods. Similarly, many fine-dining restaurants in large cities have started to require a credit-card guarantee for reservations on busy nights. Hotels and airlines have used guaranteed reservations for many years and have been able thereby to reduce the number of no-shows. One problem with credit-card guarantees in the restaurant industry, though, is that unlike hoteliers who can require one night's room rate to secure a reservation, restaurateurs lack knowledge on exactly how much the reserving party will spend on dinner and so cannot charge the specific price of the lost meal for no-shows. Restaurants using credit-card guarantees have addressed this problem by charging guests who fail to honor their reservations a stated fee (typically, $15 to $25 per guest).

Rather than require deposits or credit-card guarantees, some restaurants use a less obtrusive, more service-oriented method of reducing no-shows. These operators call their customers during the day to reconfirm their reservations for the evening to come. The call reminds the customer of the reservation and gives the customer the chance to cancel on the spot, if need be. The calls also create a reasonably solid forecast of the number of parties who intend to honor their reservation. For this approach to be successful, the incremental personnel cost associated with calling customers should be offset by the increased revenue associated with a reduction in no-shows.

Late-shows. Restaurants can manage late-shows by establishing and communicating maximum hold times for tables. When the reservation is made, customers can be informed that their table will be held for a specified period after the time of their reservation—at which time the table will be made available to any waiting party. Such a policy, if clearly communicated, can help reduce late-shows and help protect the restaurant from the resulting idle capacity. A restaurant with a RevPASH of $30 (or $0.50 per minute) would, for instance, lose $60 during busy periods (i.e., when customers are waiting) for a 4-top that is held 30 minutes for a late-arriving party.

Short-shows. Short-shows are more difficult to handle, especially, say, when the customer ordered only appetizers at dinner time and then abruptly left. In that situation, after all, the customer honored the reservation, but merely left before making a "complete" purchase. Theoretically, customers could be charged a per-person fee for short-shows, but in practice, this policy would probably not be well accepted. Hotels face a

similar problem when customers stay for a shorter time than they have reserved. Early departure fees have met with customer resistance. Some hotels handle this problem by forecasting the percentage of guests who leave early and overbooking accordingly.

Alternative Reservation Policies

Some restaurants do not expressly accept reservations, but do use call-ahead seating that allows customers to put their names in the queue, sometimes with an estimated arrival time. Such a policy can be effective for customers who know how to use it, but can be confusing and potentially frustrating to those who do not know about the telephone policy. For example, if a party has been waiting for a while and sees a later-arriving party being seated, those who are waiting may be unhappy and frustrated. Even if the call-ahead seating policy is explained, that may not always placate the dissatisfied guest. In addition, call-ahead seating can distract the host or hostess from the necessary functions of greeting and seating guests already at the restaurant.

Restaurants that do not accept reservations must be able to forecast and manage the quantity and timing of their demand.

Some restaurants take reservations only for large parties, which allows the restaurant to prepare the table ahead of time and reduce the wait for that party. Then again, if the restaurant does not require a guarantee (either with a credit card or deposit), it can end up with empty seats when it could have been serving waiting customers. One operator that I know of accepted a reservation from a party of 20 for a Friday night at 7:00 PM but did not require a guarantee. The manager set up the table ahead of time and scheduled an additional server, but the party never showed up. Meanwhile, the restaurant had turned away a number of potential guests.

Another approach to reservations is to accept reservations only during off-peak periods. Customers placing a high priority on reservations may choose to book at an off-peak time and others may be willing to forgo a reservation and take their chances on securing a table upon arrival at their desired time. Disney restaurants use a "priority" seating approach, in which guests can reserve a table only during off-peak times and can then, upon arrival, be seated at the next available "right-size" table.

Without Reservation

Restaurants that do not accept reservations and rely on walk-ins to fill their seats must be able to forecast the quantity (how many parties of various sizes) and timing (the time of day) of walk-ins and must have well-developed arrival-management policies. In addition, a table mix that reflects the composition of the party mix (for example, a fair number of 2-tops in restaurants that have many small parties) is essential.

Improved forecasting. The POS system is the best source of information on the quantity and timing of walk-ins, even though it carries the built-in liability of showing only when a check is opened and not when guests arrived or were seated. Nevertheless, POS information can be used to develop reasonable forecasts of arrival patterns by time of day and party size. Sophisticated forecasting methods are not necessary; even a simple average of the number of parties of two that arrived on Fridays between 6:00 and 7:00 over the past three or four weeks is sufficient. This forecast can then be used to improve the restaurant's seating and greeting functions.

Improved arrival management. The host or hostess is essentially the restaurant's

revenue manager. Frequently, though, restaurants place inexperienced employees in this position. Such an approach may keep labor costs down, but it can impair revenue since that particular employee may not be matching parties to tables with revenue yield in mind. For example, if a host or hostess regularly seats parties of one or two at 4-tops, the revenue effect during busy periods will be substantial.

Along that line, policies for determining the order in which customers should be seated must also be developed. Most restaurants use first-come, first-served seating, in which the parties that arrived first are seated before later arrivals, but this can be a thorny matter. The policy could backfire, for instance, if the first party on the wait list is a party of two and the open table is a 6-top. As in the case of Disney, some restaurants deal with this problem by adapting the first-come, first-served rule to one of first-come, first-served at the next "right-size" table. Although such a policy seems logical, it may diminish customer satisfaction.

Some restaurants assign a variety of side-work duties to hosts and hostesses, including handling take-out orders and answering the phone. Such an approach can work during slow times, since not many customers will be arriving at the restaurant, but it can be dangerous during busy periods. During busy periods, the host or hostess should remain at the reception stand to ensure that all guests are greeted promptly and seated or, if necessary, placed on the wait list. In addition, during busy periods, it may be wise to have multiple hosts or hostesses or use seaters to take guests to their tables.

It's important for the host or hostess to be able to give accurate wait-time estimates to arriving guests. Some restaurants prefer to underestimate wait time (in the hope that potential guests won't be scared off by a long wait), while others prefer to overestimate wait time (so that customers are pleased that they don't have to wait as long), but a reasonably accurate wait time is essential to customer satisfaction. If the host or hostess is inexperienced, it is even more important to provide guidance on how to properly quote wait times.

Optimal Table Mix

An optimal table mix is one which provides a set of tables that closely matches the mix of party sizes.[5] For example, if 50 percent of all parties are parties of one or two and the restaurant has only 4-tops, the revenue potential of the restaurant will be diminished. One of the major advantages of a table mix that matches the customer mix is that it takes much of the guesswork out of which party to seat at which table. In addition, an optimal table mix will minimize customers' waiting time, but might require staffing changes. If the optimal table mix has more tables than the original mix (as is usually the case), the restaurant may need to schedule more servers than previously. Also, the increased seat occupancy associated with an optimal table mix may increase the load on the kitchen.

A simple and effective way of determining a restaurant's optimal table mix is first to determine its party mix. Those data can be obtained through either the POS system or through observation. Once this is done, the operator needs to determine the appropriate table size for each party size.

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[5] G. M. Thompson, "Optimizing Restaurant-table Configurations: Specifying Combinable Tables," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 44, No. 1 (February 2003), pp 53–60; G. M. Thompson, "Optimizing a Restaurant's Seating Capacity: Use Dedicated or Combinable Tables?," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 43, No. 3. (June 2002), pp. 48–57; S.E. Kimes and G.M. Thompson, "Restaurant Revenue Management at Chevys: Determining the Best Table Mix," Cornell University School of Hotel Administration working paper 04-23-03; and S.E. Kimes and G.M. Thompson, "An Evaluation of Heuristic Methods for Determining the Best Table Mix in Full-Service Restaurants," Cornell University School of Hotel Administration working paper 09-04-02.

This is merely logic: parties of one or two should be seated at 2-tops, parties of three or four at 4-tops, and so forth. Because most restaurants have relatively few truly large parties, it's probably best to just lump any large parties into one category (e.g., 8+ people).

Research has shown that an improved table mix can increase revenue potential by up to 35 percent without an increase in customers' waiting time. In addition, the combinability and layout of the table mix can matter. For example, many operators believe that having only 2-tops can lead to better results because the tables can be combined into any necessary configuration. A simulation study by Gary Thompson found, however, that while combinable tables work well for small restaurants, large restaurants do better with a variety of dedicated, non-combinable tables.[6]

In addition, research has shown that changing the table mix each night (as needed) in a busy restaurant can increase revenue by 1.2 percent. This has considerable promise for restaurants that are busy for all meal periods or are busy each night of the week. If the party-size mix varies by meal period or by night, it might be worthwhile to develop and change the table mix on a regular basis. Some restaurants might also want to consider changing the table mix for certain busy days such as Valentine's Day or Mother's Day.

Uncertainty of Duration

A restaurant operator who has dealt with the arrival-time issue must still be able to predict meal length, because this controls the number of tables available. With this information, operators of reservations-based restaurants can decide which reservation requests to accept, and restaurants with a large walk-in trade will be better able to provide accurate estimates of waiting time for guests in the queue. In addition, a reduction in meal duration during busy periods can increase seat occupancy and table turnover and can lead to increased revenue.

As stated at the outset, one of the difficulties of implementing revenue management in restaurants is the fact that their explicit unit of sale is a meal (or an event) rather than an amount of time, although one could argue that the true measure of the restaurant's product is time. While the likely length of a meal can be estimated, its actual duration is not firmly set. Reduced dining times can have considerable revenue potential during high-demand periods.[7] Consider a restaurant with 100 seats, a $20 average check, a one-hour average dining time, and a busy period of four hours per day. During busy periods, defined as those when customers are waiting for a table, a decrease in dining time can increase the number of customers served and the associated revenue. Under the assumptions I just gave, the restaurant could theoretically serve 400 customers during its four-hour busy time (240 minutes/60 minutes * 100 seats), assuming all 100 seats were occupied four times for exactly one hour each time. That would result in revenue of $8,000 (400 customers * $20 average check). If the average dining time could be reduced to 50 minutes, the potential number of customers served would increase to 480 (240 minutes/50 minutes * 100 seats), and the potential revenue would increase to $9,600, an increase of 20 percent. The question of how customers would react to such changes, however, causes restaurant operators to approach time decreases with caution.

If customers think that dinner takes too long (because the service is lax), they may

[6] See: Gary M. Thompson, "Dedicated or Combinable? A Simulation to Determine Optimal Restaurant Table Configuration," *CHR Reports,* Cornell University Center for Hospitality Research, 2003 (www.chr.cornell.edu).

[7] Kimes, *op. cit.*

choose not to return to a restaurant. Similarly, if customers believe that dinner is too short, they may feel shortchanged or rushed and also may not return. The expected dining duration is affected by a number of variables, including the type of restaurant, the reason for dining (e.g., special occasion, entertainment, routine), and the characteristics of the diners (e.g., nationality, age, income, frequency of dining out, and amount of free time). For example, consider a couple who decide to dine out for their anniversary. They select what they perceive to be the nicest restaurant in town and expect to make an evening of the meal. If they go to the restaurant and they are hustled through dinner in only an hour, they may feel shortchanged.

There's no question that diners have a specific idea of how long their meal should last. In that regard, my associates and I conducted a survey to find out how long customers think a dinner with friends at a casual restaurant should take.[8] On average, customers expected the meal to last for about one hour. Interestingly, the expectations varied by nationality: Asian respondents gave the shortest expected dining time, at 57 minutes; North Americans' expectations averaged 59 minutes; and Europeans thought the meal should last about 77 minutes.

The same research team also asked questions about the length of time considered to be short, too short, long, and too long. The expected dining time of 60 minutes was much higher than the time considered to be short (30 minutes) or too short (23 minutes). The average time considered to be long was 82 minutes, while that considered to be too long was 93 minutes. This indicates that casual restaurants have considerable latitude in adjusting meal duration without upsetting customers.

As with arrival time, restaurant operators can exert control over meal duration. Internal approaches in this case revolve around setting up systems and training to make the meal length shorter and more consistent, while external approaches involve encouraging guests to give up their table even if they are not really ready to leave and choose to linger elsewhere in the restaurant.

Reducing meal duration offers great potential for increasing restaurant revenue, especially during busy periods.

By reducing time variability, managers will be better able to give accurate estimates of waiting time for those in the queue and determine whether and for what time reservations should be accepted. A restaurateur can manage duration by concentrating on menu design, service-delivery design, labor scheduling, and communication tools.

Menu design. Some restaurants have redesigned or established their menu according to the preparation and consumption time for each menu item. Menu items that exceed the established target for preparation or consumption are either reconfigured or eliminated from the menu. Likewise, menu items that cause customers to linger can be eliminated if those items do not contribute to an increase in RevPASH.

Improved service processes. The key to improving service processes is to carefully observe your current front-of-the-house procedures and target specific areas for improvement. The meal experience can be broken into three segments: pre-process, in-process, and post-process. The pre-process segment includes the time from when the customer is seated until the first course is

[8] S.E. Kimes, J. Wirtz, B.M. Noone, "How Long Should Dinner Take? Measuring Expected Meal Duration for Restaurant Revenue Management," *Journal of Revenue and Pricing Management*, Vol. 1, No. 3 (2002), pp. 220–233.

delivered; the in-process segment starts when the first course is delivered and concludes when the check is requested; and the post-process segment includes the time from the when check is requested until the customer departs.

The largest opportunities for improvement generally come during the pre-process and post-process stages. Luckily, these are also the parts of the meal that most guests prefer to move along, and so the operator does not have to worry too much about guests' feeling rushed in those segments. As I've mentioned, care must be taken when trying to speed up the in-process segment.

The pre-process segment consists of seating the guest, greeting the guest, taking the drink order, delivering drinks, taking the food order, and delivering the first course.

The greatest chances for tightening the dining process are before and after the meal—which most guests also would like to move along.

Problem areas in this segment generally include delays in greeting the guest, delays in delivering the drinks, and delays in taking the food order. If an operator can figure out ways to reduce delays of that kind, meal duration will drop and customer satisfaction will most likely improve.

The concerns regarding the in-process segment are primarily to keep focus and maintain the pace. The operator must ensure that food is delivered in a timely fashion, that the timing of the courses is appropriate, and that the guest does not feel rushed. Pre-bussing can and should occur, but guests should not feel as if they are being pushed out the door.

The post-process segment consists of the check request, the check delivery, the payment process, the check return, and guests' departure. Generally, once guests request the check, they are ready to leave the restaurant. Anything that the restaurant can do to speed the check-processing time will enhance guest satisfaction and reduce dining duration (again, without unduly rushing the guest).

Staffing. Redesigning the menu and procedures, in conjunction with improved forecasts of customer arrivals, should improve labor scheduling, which is a key element in controlling meal duration. Restaurateurs' common desire to minimize labor costs may backfire if reduced staffing leads to slower table turnovers and longer meal times. The increased revenue resulting from faster table changeovers made possible by extra bussers or servers may more than compensate for the increased labor costs. Implementing a revenue-management strategy would help a restaurant operator determine appropriate staffing levels.

Communications. Some restaurants have improved communication systems among employees and have increased control by tracking the connection between food preparation and food delivery. By setting up appropriate communication mechanisms, kitchens can notify servers that a course is ready for pick up and servers can notify bussers that a table is ready to be cleared, thereby speeding the meal service (usually to the guests' delight) and making it possible to improve RevPASH. To assist with employee communication, some restaurants have used information technology such as headsets and table-management systems.

External Approaches

Part of duration management involves finding ways to signal to guests that it is time for them to relinquish their table. Customers who unexpectedly linger after their meal may interfere with seating the next party. A

restaurant can use both implicit and explicit signaling devices to remind guests that the meal is over. Many restaurants use subtle implicit approaches such as bussing the table, dropping off the check, or offering valet service. In a few restaurants, customers are asked to specify how long they plan to stay, but that is rare. Instead, the restaurant manager must rely on timing the courses and other implicit signals to remind the customer that the meal has ended.

Explicit approaches risk customer ire. A manager obviously cannot directly ask customers to leave, but the restaurant could attempt other, less offensive methods of turning the table. Some restaurants in the theater district of New York City, for instance, place an hourglass on each party's table. When the sand in the hourglass is gone, patrons have a visual cue to finish dinner and leave so that they will not be late to the theater (and, not incidentally, release the table).

Reducing Changeover Time

Reducing the amount of time between customers (changeover time) increases capacity and revenue. This tactic will not offend a departing customer and should please the customers who are waiting to be seated. As an example, reducing changeover time has become a common strategy in the airline industry. Southwest Airlines and RyanAir both boast 20-minute aircraft turnarounds and have thereby been able to increase plane use. Cabin employees at Southwest, for one, actually enlist passengers' assistance in clearing the cabin by asking them to hand over discarded newspapers and other trash that usually would be left in the seatback pouch. A quick-turn strategy suits the restaurant industry. The manager of a fine-dining restaurant in Las Vegas with a RevPASH of $60 knows, for instance, that each seat in his restaurant generates $1/minute. If customers are waiting and a 4-top has not been bussed and sits vacant for five minutes, it costs that restaurant $20. When viewed this way, the cost of an additional busser to promote a quick turn seems minor. (Bear in mind, however, that the $20 in question is revenue, and not necessarily contribution, a fact that should be considered in looking at the value of the busser.)

Managers can do a number of things to ensure that changeover time is minimized. First, they should insist that bussers and servers work as teams and do a good job of pre-bussing the table. The fewer items left on the table when the guests depart, the easier and faster it will be to clear and reset the table. In addition, as I indicated, pre-bussing, if not overly aggressive, can send a reasonably subtle signal to customers that it is time to relinquish the table.

Clear communication among bussers, servers, and hosts helps bussers and servers know when a table is ready to be cleared and reset, and those employees should, in turn, notify the host so that he or she can find the next party to be seated at that table. Some restaurants use technology such as table-management systems to facilitate this communication process, but as long as a clear line of communication is established, technology is not always necessary.

Management should also analyze and streamline the process of clearing and resetting tables to minimize changeover time. Again, it helps to think of an idle table as potential revenue. Anything that can be done to shrink this time, whether it is having pre-rolled flatware and napkins, easily accessible tablecloths, or well-placed glassware, can help the restaurant increase revenue.

When customers are waiting at busy restaurants, one of the major stumbling blocks to reducing the changeover time is locating the next party to be seated. Some restaurants use technology (such as loudspeakers or hand-held signaling devices) to

quickly notify guests, but this technology is not appropriate for all restaurants, since customers don't always respond well to such approaches. If hosts know which tables will be available and know where to find the next party, they can find the party ahead of time and have the customers ready to be seated as soon as the table comes up. Otherwise, if hosts wait for notification that a table is ready, it may take some time to find the party, some time for the party to settle or transfer its account in the bar (if that's where the customers are waiting), and some time to walk the party to the table. Again, it helps in this context to think of an idle table as potential revenue being squandered. It may be worthwhile to hire an additional seater to handle this process.

Pricing

The key to any successful revenue-management strategy is to offer multiple prices to a variety of market segments, as appropriate. For example, movie theaters often offer lower prices to seniors and children at certain times of the day or on certain days of the week. Similarly, the airline industry offers a wide variety of prices on the same route depending on the time, method, and itinerary for the booking. That means, for example, that economy passengers flying from Los Angeles to Singapore may pay nothing (by using frequent-flyer miles) to over $1,500 for the same seat.

To apply this multiple-price approach to the restaurant industry, managers must answer two questions: what prices should be charged, and who should pay which price? The answers to those two questions are affected by the answer to a third question—how will customers react to variable prices?

Setting the Price

Revenue management is often associated with manipulating prices according to demand characteristics. On the surface, many restaurants seem to do so by offering variable prices, usually based on the time of day (e.g., the early bird special) or the day of the week (e.g., the Friday fish fry). Such variable pricing, however, cannot necessarily be said to constitute revenue management in the absence of a customer-focused strategy. The three chief methods for setting prices are cost based, demand based, and competitively based. Revenue management typically involves demand-based pricing, but some companies practicing revenue management use other types of pricing strategies, as well.

Cost-based pricing. Restaurants have traditionally used cost-based pricing, in which the cost of the menu item's ingredients is first calculated and then multiplied by some constant (usually about 3) so that the restaurant can maintain a certain food-cost percentage (usually about 30 percent). While it is certainly important to track costs, a cost-based pricing approach can lead to sub-optimal results, particularly in situations in which customers are willing to pay more than the cost-based price. In addition, it may be worthwhile in some situations to offer a lower price in an attempt to stimulate demand (of course, assuming that all costs would still be covered).

Demand-based pricing. Demand-based pricing is based on the notion of responding to guests' demand characteristics, in particular their response (or lack thereof) to changes in prices. As an example, a resort in Malaysia catered to three major market segments: Europeans, Japanese, and groups from other parts of Asia. The segments varied in price sensitivity: the Europeans and Japanese were not price sensitive, while the Asian groups were extremely price sensitive. This hotel operated three restaurants: a buffet restaurant, a sit-down Asian-style restaurant, and a sit-down steak and seafood restaurant. The average check per person was about $12 in the buffet restaurant, $15 in the Asian restaurant, and $30 in the steak

and seafood restaurant. The price-sensitive Asian groups preferred to eat in the buffet restaurant, and the non-price-sensitive Europeans preferred the sit-down Asian restaurant, in which they could get "safe" local food. Upon careful reflection on the price sensitivity of the resort's different markets, the manager decided to increase the prices at the Asian restaurant by 30 percent. The decision was well taken, as there was no decrease in that restaurant's volume, so revenue and profit increased by 30 percent.

One version of demand-based pricing is charging a relatively high price during high-demand times and a lower price during low-demand times. As an example of that approach, a restaurant in Singapore experienced extremely high demand on weekends and much lower demand during the week. The managers decided to develop a special weekend menu that featured prices that were 25-percent higher than during the week. Once again, the restaurant suffered no change in volume, so weekend revenue and profit increased by 25 percent.

Both examples illustrate uses of demand-based pricing. The hotel in Malaysia used information on the price insensitivity of its European customers to change prices in the restaurant considered most attractive by those guests, and the Singaporean restaurant realized that it was underpricing its high-demand periods.[9]

Menu engineering supports another form of demand-based pricing.[10] With menu engineering, the contribution margin (selling price less the cost) and the number of units sold of each menu item are calculated and plotted on a graph. The menu items are then divided into the following four categories: **(1)** *Stars*: above-average contribution margin and above-average volume; **(2)** *Cash cows*: below-average contribution margin and above-average volume; **(3)** *Question marks*: above-average contribution margin and below-average volume; and **(4)** *Dogs*: below-average contribution margin and below-average volume. Stars and cash cows are good candidates for potential price increases since they both have high demand, while question marks may be possible items for price decreases.

The key to any successful revenue-management strategy is to offer multiple prices to a variety of market segments, as appropriate.

Restaurants that use menu engineering generally review their results each month and make necessary price adjustments. Of course, this necessitates the printing of new menus, but that cost is generally minimal and should be more than covered by the associated revenue increase.

Competitive pricing. Some restaurants set their prices according to competitors' prices. For example, if they offer a grilled fish, they make sure that their price is similar to that of their competitors. If their grilled fish is slightly better or if the atmosphere of their restaurant is more upscale, they may charge a slight premium over the competition. On the other hand, if their grilled fish is not quite as good or if the restaurant is less upscale, they might offer a slightly lower price. Competitive pricing, which is prevalent in the hotel and airline industries, can be successful, but companies that use competi-

[9] A cautionary note: Increasing prices, as in the cases cited here, must be handled carefully. At no time should a restaurant (or any other hospitality operation) be seen as price gouging or taking unfair advantage of customers by raising prices in times of stressful or emergency situations.

[10] For a discussion of menu engineering, see: Lee M. Kreul, "Magic Numbers: Psychological Aspects of Menu Pricing," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 23, No. 2 (August 1982), pp. 70–75; David K. Hayes and Lynn Huffman, "Menu Analysis: A Better Way," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 25, No. 4 (February 1985), pp. 64–70; and David V. Pavesic, "Prime Numbers: Finding Your Menu's Strengths," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 26, No. 3 (November 1985), pp. 70–77.

tive pricing seem to assume that their competitors have set their prices correctly. If this assumption is untrue, the use of competitive pricing could be dangerous.

Need for experimentation. Successful price increases are often associated with experimentation. The cost of printing a new menu is relatively low, and a new menu with new prices can easily be tested. If customer reaction is negative, the new menu can be withdrawn, and if customer reaction is neutral or positive, the menu can be continued. Offering nightly specials allows a restaurant to experiment with different prices and menu items in a non-threatening way.

Who Pays Which Price?

In differential-pricing systems, the question of which customers pay which price is usually addressed through the use of rate fences.[11] Hotels and airlines use rate fences to offer discounts on inventory that might otherwise not be sold at all to customers who might otherwise not purchase that inventory—while at the same time preventing customers who were going to buy anyway from taking advantage of a discount that they did not actively seek. For example, the familiar airline or hotel rate fences include requiring customers to make their reservation in advance, prepay for their reservation, or stay over a Saturday night. The fences can comprise almost any set of rules as long as they somehow make sense to the customer.

While early bird specials and the like constitute rudimentary rate fences, managers must think beyond happy hours and two-for-one specials, which do not really discriminate the price-sensitive customers from their free-spending friends. Instead, restaurateurs must develop stratagems for offering differential prices that make sense for the demand level for a given time. As a rule, restaurants offer the same menu prices regardless of the customer's demand characteristics. Perhaps the question for restaurateurs is whether they could implement some kind of pricing differential for busy times (e.g., Saturday nights) and slack times. Early bird specials are a step in this direction, as are special prices for affinity groups and frequent-diner clubs. The next step is to create an overall demand-management program based in part on demand-based pricing.

Unfair? Restaurant operators are often reluctant to use demand-based pricing because of the potential customer backlash stemming from perceptions of unfair conduct. If increased prices cannot be justified in some way (say, by menu items that obviously have high production values or by offering other desirable conditions), customers may view demand-based-pricing policies as unfair. The issue of fairness has been studied extensively in a variety of industries. In general, it has been found that fair behavior on the part of operators is instrumental to the maximization of their long-term profits.

Consumers may perceive demand-based pricing as being unfair for at least two reasons. First, they may view charging high prices during high-demand times as exceeding their reference price, or their reference price may already have been shifted down because of low prices charged during low-demand periods. In either event, the "new," higher regular prices may be perceived as less fair than before. Second, the restaurant may not be seen as providing more value for the higher price. I will first discuss the effect that demand-based pricing can have on consumer reference prices, followed by an examination of the potential effect on the perceived fairness of demand-based pricing.

Reference prices. I have used the terms "reference transaction" and "reference price," which are often used when discussing

[11] R.B. Hanks, R.P. Noland, and R.G. Cross, "Discounting in the Hotel Industry, A New Approach," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 33, No. 3 (June 1992), pp. 40–45; and R.J. Dolan and H. Simon, *Power Pricing* (New York: The Free Press, 1996).

fairness.[12] A reference transaction is how customers think a transaction should be conducted, and a reference price is how much customers think a service (or product) should cost. Reference prices can come from the price last paid (especially at your restaurant), the price most frequently paid, and what other customers say they paid for similar offerings, as well as from market prices and posted prices. For example, customers may know that they generally pay about $25 for dinner at a particular restaurant, and so their reference price for dinner at that restaurant is $25.

To assess a transaction's fairness, customers often rely on reference prices in relation to what they are paying for the current transaction. For consumers to perceive the price increases inherent in demand-based pricing as being fair, guests' reference prices would have to shift in line with the restaurant's variable-pricing schedule. This may be difficult for operators to achieve for two reasons. First, as I just indicated, the low price used during low-demand periods may become the customer's reference price and may make future purchases at the regular or peak rate seem unfair. Second, consumers may believe that the restaurant is charging them higher prices to reap higher profits without having increased the customer's value.

Rate fences. Rate fences are designed to allow customers to segment themselves based on their willingness to pay, their behavior, and their needs.[13] One chief purpose of a rate fence is to create customer segments and justify why different people pay different prices. To be perceived as fair, fences need to be logical, transparent, up-front, and fixed, so that they cannot be circumvented.

The two overarching categories of rate fences are physical and non-physical. Physical rate fences for a hotel might include room location, furnishings, and the presence of amenities or a view. Non-physical rate fences include time of consumption, transaction characteristics, buyer characteristics, and controlled availability. In a restaurant context, physical rate fences include table location (e.g., a better table commands a higher price), view (e.g., tables with a scenic view cost more), and amenities (e.g., tables in a private room with fresh-cut flowers cost more). Non-physical rate fences might include time (e.g., a weekend dinner might cost more, or meals consumed before 6:00 PM might cost less), transaction characteristics (e.g., customers who make a reservation over a month ahead of time might pay less), buyer characteristics (e.g., frequent customers might pay less or get free-of-charge extras), and controlled availability (e.g., customers with coupons will pay less).

The question of which customers pay which price is usually addressed through the use of rate fences.

Research on rate fences. My colleagues and I studied the perceived fairness of five potential rate fences for restaurants—specifically, several time-based fences (i.e., differential pricing for lunch and dinner, weekdays and weekends, and specific times of the day), one physical fence (i.e., table location), and one controlled-availability fence (i.e., two meals for the price of one).[14] We also

[12] D. Kahneman, J.L. Knetsch, and R.H. Thaler, "Fairness and the Assumption of Economics," *Journal of Business*, Vol. 59 (October 1986), pp. S285–S300.

[13] Hanks *et al., op cit.*; Kahneman *et al., op cit.*

[14] S.E. Kimes and J. Wirtz, "Perceived Fairness of Demand-Based Pricing for Restaurants," *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 43, No. 1 (2002), pp. 31–38; S.E. Kimes and J. Wirtz. "Has Revenue Management Become Acceptable? Findings from an International Study on the Perceiving Fairness of Rate Fences," *Journal of Service Research*. Vol. 7, No. 2 (2003), pp. 125–135.

investigated how customers react to the way price differences are presented. Specifically, we wanted to know whether a fence framed as a price *decrease* would be evaluated more favorably than the same fence presented as a price *increase*. Research has shown that presentations that emphasize customer gains are preferable to economically equivalent frames that emphasize customer losses.

In that regard, consider a restaurant with a static menu that decides to establish two sets of menu prices. The restaurant can present the price differences in two ways: it can either present the lunch prices as being 20-percent lower than the dinner prices (framed as a gain from the diner's perspective), or it can present the dinner prices as being 20-percent higher than the lunch prices (framed as a loss). The situations are economically equivalent, but research has shown that customers will view the "reduced" prices more favorably, and that the restaurant should frame the price difference accordingly.

Results. We found that restaurant patrons consider demand-based pricing in the form of coupons (i.e., two for the price of one), time-of-day pricing, and lunch-versus-dinner pricing to be fair. Variable weekday-versus-weekend pricing was perceived as neutral to slightly unfair. Table-location pricing was seen as somewhat unfair, with potential negative consumer reaction to that practice. With regard to framing demand-based pricing as discounts or surcharges, we found that demand-based pricing presented as discounts made the differential prices seem fairer in the consumers' eyes, and therefore less likely to have a negative effect on consumers' perceptions and reactions.

Our findings provide restaurant operators with some useful guidelines, but those findings do not guarantee that all guests will willingly accept demand-based-pricing practices. Therefore, when developing demand-based pricing using fences, restaurant operators must make sure that the rate fences are easy to explain and administer, and that customers can understand the reasoning behind them. This will make it easier for front-line employees to pacify unhappy or confused customers. Moreover, employees must understand that demand-based pricing is a win–win situation. It needs to be emphasized that variable pricing allows patrons to choose prices that suit their needs, and, by having tight fences, a restaurant can ensure that patrons who see high value in a good view, a desirable table, or eating dinner during peak times are much more likely to get the dining experience they seek. Accordingly, increased profitability via demand-based pricing does not have to come at the expense of customer satisfaction and loyalty.

Developing a Revenue-management Program

When developing a revenue-management program, a restaurant operator must first understand current conditions and performance.[15] Following this, the operator must evaluate the possible drivers of that performance. This understanding will help managers determine how to improve RevPASH statistics. Finally, the manager must monitor the effects of changes on revenue performance. I describe each of these steps below.

(1) *Establish the baseline*. Most managers know their average check and their labor- and food-cost percentages, but few can accurately gauge their restaurants' seat occupancy or RevPASH. To develop a revenue-management program, operators must collect detailed information on arrival, seat occupancy, and RevPASH patterns; party-size mix; meal times; and customer preferences. This information can be collected from a variety of sources, including

[15] Much of this section comes from: Kimes, *op. cit.*

the POS system, guest checks, and methodical observation. Once collected, the data must be analyzed to determine the mean and variation of dining time and daily and hourly seat occupancy and RevPASH patterns.

(2) *Understand the drivers.* Once the baseline data have been collected, managers should analyze the factors that affect meal duration and RevPASH performance. Simple tools such as process analysis, service blueprints, and fishbone diagrams can be used to better delineate the possible reasons for why meals last as long as they do and to help identify the most important problems in controlling meal duration.[16]

(3) *Develop a strategy.* After identifying the causes of the most important problems affecting the service cycle, managers should develop detailed recommendations on how to correct those problems. Some solutions may deal with reducing the overall meal duration, while others may deal with reducing variability in particular service steps (e.g., order-taking, bussing), and still others involve table mix or customer-arrival management. The manager should analyze the potential return on investment for each recommendation to ensure prudent decision making.

(4) *Implement the changes.* For revenue management to be successful, restaurant operators must ensure that managers, servers, bussers, and other employees clearly comprehend the purpose and practice of revenue management. This requires a position-specific training program that helps employees understand their role in revenue management and how revenue management will benefit both the restaurant and the employees themselves. Additionally, operators should align any employee-incentive programs to coincide with the objectives of revenue management.

(5) *Monitor outcomes.* As with any business practice, the success of revenue management cannot be assessed without measuring changes. After establishing the baseline and implementing revenue management, operators must develop a system to measure financial, operational, and customer-satisfaction performance.

An Application: Chevys Freshmex Restaurants

Chevys Freshmex Restaurants, a chain of over 200 mid-scale Mexican restaurants located primarily in the southwestern United States, was interested in increasing restaurant profitability by implementing a revenue-management strategy.[17] Chevys prides itself on its fresh ingredients, its lively atmosphere, and its friendly staff. The chain has done well, but management noticed that waits were long, particularly on weekend nights, and guests sometimes complained about the length of time it took to dine at the restaurant.

The Chevys Arrowhead restaurant is located in the Arrowhead Shopping Mall in a suburb of Phoenix, Arizona. Given that the restaurant is surrounded by a host of competing restaurants, many potential customers would put their names on the wait list for several of these restaurants and patronize the one that gave them a table first. Managers reasoned that if Chevys could reduce its wait time, it should be able to attract more of these customers and increase revenue.

The restaurant had been open for over nine years, and the general manager had been in place since the restaurant opened. She was considered to be one of the top managers in the Chevys system and had built a strong and loyal team.

This particular restaurant had 230 seats in the main dining room (MDR) and 50

[16] For a discussion of process-analysis tools, see: D. Daryl Wyckoff, "New Tools for Achieving Service Quality," *Cornell Hotel and Restaurant Administration Quarterly,* Vol. 25, No. 3 (November 1984), pp. 78–91.

[17] Much of this section comes from: S.E. Kimes, "Restaurant Revenue Management: Implementation at Chevys Arrowhead," *Cornell Hotel and Restaurant Administration Quarterly,* Vol.45, No. 1 (February 2004).

more seats in the bar. In addition, patio seating was available from March through November. Most tables (53) in the MDR were 4-tops, and the remaining three tables were 6-tops. Open from 11:00 AM to 11:00 PM on weekdays and 11:00 AM to midnight on weekends, the restaurant draws a variety of customers, including shoppers, couples, and families. As is typical in many restaurants, this outlet is busy for weekend dinners and lunches, when customers often wait for a table for over an hour. On the other hand, the restaurant is particularly slow on weekdays before noon and between 2:00 and 5:00 PM, and after 8:00 PM on Sundays through Thursdays.

A revenue-management-based analysis would highlight the portions of the service process that could improve revenue per available seat-hour.

The Revenue-management Approach

The five-step process outlined above was used to develop a revenue management strategy for Chevys Arrowhead.

Step #1: Establishing the Baseline

Two four-week periods of POS data and detailed time studies were used to develop the baseline for the Arrowhead restaurant. The average check, the revenue per available seat-hour (RevPASH), the seat occupancy, the meal duration (both from the POS data and from the time studies), and the party-size mix were analyzed, as follows.

Average check. The average check per person for the 230-seat MDR was calculated by day of week and hour of day. The average check was $12.70, with hourly ranges from $9.02 at 11:00 AM on Fridays to $14.47 at 8:00 PM on Thursdays. The highest average checks occurred on Thursday, Friday, and Saturday evenings, while the lowest occurred for weekday lunches.

RevPASH. The POS data were used to derive hourly RevPASH figures. RevPASH was calculated by first determining the total hourly revenue for each day of the week and then dividing the hourly revenue by the 230 seats in the MDR.

RevPASH ranged from $0.43 on Tuesdays at 2:00 PM to $7.03 on Fridays at 6:00 PM. The highest RevPASH occurred on Fridays from 5:00–9:00 PM, on Saturdays from noon–2:00 PM and 6:00–8:00 PM, and on Sundays from 1:00–2:00 PM. The lowest RevPASH was experienced after 9:00 PM every day, and before noon and between 2:00 and 5:00 PM on all weekdays.

Duration. The check-opening and -closing times from the POS data were used to calculate the mean and variation of dining duration. The duration figures may be slightly inaccurate because the opening of the check did not necessarily correspond to when the customers were seated at the table and the closing of the check may not reflect when the guests actually left the table.

The average meal duration for dinner (after 4:00 PM) was 50 minutes with a standard deviation of 20 minutes, while the average meal duration for lunch (before 4:00) was 44 minutes with a standard deviation of 16 minutes. Other than the division between lunch and dinner, the averages and standard deviations did not vary much by day of week or by hour of the day.

Seat occupancy. RevPASH is defined as seat occupancy multiplied by average check and divided by average meal duration, so seat occupancy was calculated by dividing the average check by the RevPASH and multiplying by the average meal duration for that time period. Seat occupancy figures for the main dining room were calculated by day of week and hour.

Seat occupancies are constrained by the table mix, as I explain below, with the highest seat occupancy achieved being only 55 percent (between 6:00 and 7:00 PM on Fridays). More generally, seat occupancy over 50 percent was achieved on Fridays and Saturdays from 6:00 to 8:00 PM, on Saturdays from noon to 2:00, and on Sundays from 1:00 to 2:00 PM. Extremely low seat occupancy (that is, under 15 percent) occurred on weekdays before noon, between 2:00 and 5:00 PM, and after 9:00 PM on most days.

Time-study data: Since the POS data included only information on total meal duration and did not have information on the timing of the meal, detailed time studies were conducted for weekend dinners. A student observer timed 100 parties over several weeks. The following ten categories were timed: seated, greeted, drinks delivered, order taken, entrée delivered, check requested, check delivered, departure, table bussed, and table reseated. The average mealtime of 53:15 (with a standard deviation of 22:46) was a bit longer than the estimate obtained from the POS data since the time-study data clocked the time when the party was actually seated, while the POS data could only show when the check was opened and closed in the POS system.

The mean, standard deviation, and coefficient of variation (defined as the standard deviation divided by the mean) of each category were calculated. Categories with a high average time represent areas in which time savings and revenue gains can be achieved. Categories with a high coefficient of variation represent areas in which variation can be reduced to increase revenue.

Examining the dining experience. The dining experience represents the time from when the customers are seated until the time they depart.

(1) *Seating to greeting* (mean = 1:48, standard deviation =1:44). Greeting was quick, but had high variation. Most parties were greeted within two minutes.

(2) *Greeting to drinks delivered* (mean = 2:40, standard deviation =1:57). Drinks were delivered fairly quickly but some inconsistency was noted.

(3) *Drinks delivered to order taken* (mean = 3:28, standard deviation = 3:20). Again, orders were taken fairly promptly, but the variation was high.

(4) *Order taken to entrée delivered* (mean = 11:28, standard deviation = 6:12). Entrées took about eleven-and-a-half minutes to deliver, and the standard deviation was fairly high. This could be because of the variety of entrées offered or because of servers' not knowing when orders were ready to be delivered.

(5) *Entrée delivered to check dropped* (mean = 20:12, standard deviation = 7:19). On average, customers took slightly over 20 minutes between when their order was delivered and when the check was delivered to the table (generally after the guest requested the check). There was a reasonably high variation in this category.

(6) *Check dropped to change returned* (mean = 5:40, standard deviation = 3:48). It took over five minutes from when customers requested the check until it was delivered. This represents a process ripe for tightening. The variation was fairly high, which indicates that training might help improve this situation.

(7) *Change back to departure* (mean = 4:20, standard deviation = 5:07). Customers took a bit over four minutes to leave after their change had been delivered. The variation was fairly high, which again indicates a potential area for improvement.

(8) *Bussing and reseating.* Bussing took 2:44 (standard deviation = 2:11), and once the table was bussed, reseating only took 0:52 (standard deviation = 0:31).

Party composition. Data on party size were obtained from the POS system. The

majority of parties (approximately 65 to 70 percent) comprised one or two people. About 20 to 25 percent of parties had three or four guests, 5 to 6 percent of parties were five to eight guests, and only about 1 percent of parties had nine or more guests. (Party size was not entered for 3 to 5 percent of all parties.)

The findings on party size are an issue for the Arrowhead restaurant, because nearly all of its tables are 4-tops. If the table mix could be reconfigured while still maintaining the same number of seats, revenue potential during peak demand periods would almost certainly increase.

Step #2: Understanding the Causes

The baseline analysis led to several questions: **(1)** Why was seat occupancy so low even though customers were waiting for tables?, **(2)** Why was the meal itself taking so long?, **(3)** Why was there so much variation in meal duration?, and **(4)** Why were certain parts of the meal (mostly at the beginning and end of the meal) taking so long?

Because the table mix did not match the customer mix, the restaurant struggled to exceed 50-percent occupancy, even at its busiest times.

The analysis highlighted two areas that were interfering with the flow of service: namely, the table mix and the service-delivery process.

Table mix. Even if dining time could be reduced, customer flow would not increase as much as desired because of the table mix. The party-size calculations showed that 52 to 56 percent of the customers were in parties of one or two, but, as I mentioned above, all of the tables were 4-tops or 6-tops. It was no wonder that seat occupancy struggled to exceed 50 percent at the same time that customers were waiting for tables. What became clear is that all of the tables were occupied, but often had empty seats because of the large number of small parties.

Service delivery. Three major problems were identified with the service-delivery process. The high variability in dining time seemed troublesome, as did the delays in completing payment and bussing. Each was analyzed to help determine the possible causes for the delays.

Variability. The standard deviation of dining duration was relatively high (nearly 23 minutes), and the same was true of the standard deviations of many of the meal segments. This high standard deviation had several consequences, but the chief outcomes were that **(1)** the restaurant was more difficult to manage, and **(2)** customers might view the service as inconsistent.

The sources for such high variation were the customers themselves (e.g., they wanted to linger after their meal, or they took a long time to order), the employees (e.g., insufficient staffing, poor training, poor communications), the menu and the kitchen (e.g., too many menu items, inefficient kitchen design), service processes (e.g., poor service delivery, inconsistency), and the managers (e.g., not visible or insufficiently proactive).

After much discussion, training and management were deemed to be the major controllable causes of the high variability in dining duration. Even though Chevys had corporate standards for the duration of each meal segment, all employees learned those standards in training, and a manager was always on duty, somehow enforcement of these standards was lax.

Payment process. Analysis of the time study data indicated substantial delays at the beginning and end of the meal. Chevys chose to focus its attention chiefly on the

Continued on page 28

Making Revenue Management Work for You

By analyzing its service processes and table mix, Chevys Arrowhead was able to increase revenue by approximately 5 percentage points more than the other two Chevys that we examined. This performance boost came from its improved table mix, changes in the service delivery, and improved training. Seat occupancy and RevPASH increased, dining duration and variation in the duration decreased, and revenue and profitability increased. If you want to improve your restaurant's revenue in a manner similar to Chevys Arrowhead, you should first establish your restaurant's baseline performance. Collect at least a month of detailed POS data and analyze your seat occupancy, average check, RevPASH, party mix, and dining duration by day of week and hour of day. In addition, hire someone to conduct time studies of your restaurant during your busy periods (this is an ideal part-time job for a student).

After you have established your baseline performance, sit down with your management team and staff members to make sense of what you have discovered. Discuss what might be driving your performance and pinpoint specific areas in need of improvement.

When developing a strategy, focus on your busy periods, establish specific performance goals, and determine feasible ways of meeting these goals. In addition, be sure to assess the financial effects of any given strategy. Proper implementation of the strategies is probably the most difficult part of the process, but it also is the most important. Implementation requires a strong management team, good training, and a willingness to try new things (such as changing the table mix or hiring more employees).

Finally, when you have made all of the changes, reevaluate your performance after about two months by comparing your current results to your baseline statistics. Gather additional POS data and conduct additional time studies to see whether your efforts have paid off.

For more information on developing a revenue-management program, you can read the articles mentioned in this report, take the courses in restaurant revenue-management from e-Cornell (www.ecornell.com), or enroll in a restaurant-revenue-management course offered through the Cornell Hotel School's Professional Development Program (PDP).—*S.E.K.*

end-of-meal delays. Payment delays could be caused by a number of problems, including technology (e.g., credit card authorization, insufficient number of POS terminals), personnel (e.g., servers were inattentive or working on other tasks, servers were not noticing when guests wanted to pay, servers were not picking up the completed check folder before guests left), and customers (e.g., customers were not ready to pay, customers did not ask for the check, customers were uncomfortable leaving the completed check folder on an unattended table).

Reducing the variability in meal segments was as important as trimming the actual duration of those segments.

Managers presented the staff with the results of the baseline analysis and discussed the payment process. Many servers said that credit card processing was slow, particularly during busy shopping periods, and that servers often grew impatient with waiting for the card approval, returned to the restaurant floor to serve other customers, and sometimes forgot about the bill that was being processed. In addition, many servers said that they felt uncomfortable with picking up the completed paid folio because they thought that the guests would think they were too eager to see their tip. Interestingly, several guests had complained or commented that the servers had not picked up the completed check folder quickly, and that the customers felt uncomfortable leaving their credit card number or cash on the empty table, where other people could conceivably have access to it.

Bussing. Bussing was also a problem. It took nearly three minutes to clear and reset the table. If this time could be reduced, particularly when the restaurant was on a wait, more customers could be served, perceived service quality would increase (since seated guests would not have to be looking at a dirty table, and waiting guests would not have to see empty tables), and revenue would increase. The slow bussing could be attributed to one or more of the following factors: communication (e.g., poor communication between servers and bussers), processes (e.g., poor pre-bussing, not enough space for dirty dishes in kitchen), and staffing (e.g., insufficient bussers, lack of sense of urgency).

During the staff discussion, both bussers and servers pointed out that pre-bussing was inconsistent. In addition, many servers were neglecting to pre-bus their tables, feeling that it was the bussers' responsibility, while the bussers felt that their responsibilities were to provide chips and salsa and to clear and reset the table once the guests had left. In addition, many servers were not "tipping out" the bussers, so bussers felt little incentive to help out with pre-bussing. Finally, the bussers pointed out that the recent changes in the bussing process (previously they had used buckets to clear the table, but currently they had to use trays) as being a potential contributor to the problem.

Step #3: Developing a Revenue-management Strategy

The two major goals were to reduce dining duration by five minutes and to increase seat occupancy by 10 percent. An ancillary goal was to reduce the standard deviation of total dining time by 30 percent. Managers estimated that these changes would increase revenue by 5 percent during the nine busy hours per week.

After determining the goals, the managers started their implementation by specifying the busy (hot) and slow (cold)

periods by day of week and hour of day. "Hot" periods were defined as times when customers were waiting to dine, and all other periods were designated as "cold." The restaurant's nine hot hours were Friday, 5:00 to 9:00 PM; Saturday, noon till 2:00 and 6:00 to 8:00; and Sunday afternoon from 1:00 to 2:00). These were the busy hours that were the focus of the revenue management program's goal of a 5-percent revenue increase.

The goal of increased seat occupancy could be achieved by attracting more customers, providing a better table mix so more customers could be accommodated, or reducing the dining duration so more customers could be served. There was no point in attempting to attract more customers, because restaurant already had more customers than it could currently serve during its hot periods (by definition). Moreover, since customers could easily defect to another restaurant even after they put their name on the waitlist, attracting more customers made no sense. Not only that, but the restaurant's existing table mix and dining duration would not allow the restaurant to serve additional customers. Thus, the managers' focus was on improving the table mix and reducing dining duration.

Of the two strategic levers available to restaurants for revenue management (i.e., duration control and price), the Chevys managers chose to focus on duration, or process control. The team concentrated on ways to better manage arrivals, tighten meal duration, and reduce the amount of time between customers.

Arrival Management

As mentioned earlier, customer arrivals can be managed either internally (with policies that do not directly involve customers) or externally (with methods that involve customers). Since it did not take reservations, the restaurant could not use methods relating to reservations (including overbooking and better forecasting). Instead, its tactics had to focus on an internal policy (namely, a better table mix) and an external procedure (i.e., improved hosting). Although the management team considered revising hosting procedures, it first took on the table mix—a tactic that would be least visible to customers and perhaps offer the best revenue rewards. The team did review potential hosting changes, including better training, technology alternatives (such as a table-management system or buzzers to notify customers that their table was ready), and assignment of management personnel to this position.

It seemed to all involved that an improved table mix would have the most effect on revenues. The optimal table mix would be one that maximized revenue for the restaurant's existing party mix. A table-mix simulator developed by Gary Thompson was used to develop the optimal table mix for the restaurant as well as a set of "near-optimal" mixes (near optimal was defined as within 1.5 percent of optimal).[18]

The optimal table mix maintained the same number of seats, but changed the table mix from fifty-three 4-tops and three 6-tops to forty 2-tops, twenty-four 4-tops, five 6-tops, and three 8-tops. Chevys hired a restaurant designer, informed her of the optimal table mix, and set her to work with the following two stipulations: maintain the same number of seats, and make the design attractive and useable. The implementation of the table mix will be discussed below.

Duration Management

The management team then turned to process-control issues. Like arrivals, duration can also be managed internally or externally. Internal methods include changes in the service-delivery process, changes in the

[18] See: Thompson, *CHR Reports, loc.cit.*

menu, and changes in the restaurant ambience (e.g., color, sound, and comfort). External methods include providing cues to customers that it is time to leave and setting a pre-specified time that customers can use a table. Again, the restaurant focused on internal methods to avoid the possibility of offending customers with external tactics.

The time-study results and the analysis of potential causes led to a focus on the payment process. Specifically, the goal was to reduce the mean payment time by one-and-one-half minutes and to reduce the variation around that mean.

The team also wanted to reduce the amount of time between parties by 30 seconds. The team judged that bussing took too long and focused on that as the step to be tightened up.

Finally, the team wanted to reduce overall meal duration variability. Based on the analysis of the causes, the focus was on improving training and strengthening managerial oversight.

Potential Revenue Effects

Before assessing the revenue improvements stemming from increased occupancy and decreased dining duration, the annual revenue during hot periods was calculated. To review, the 230-seat main dining room had nine hot hours per week. Before revenue-management interventions, an average "hot" seat occupancy of 50 percent, an average "hot" check of $12.73, and an average dining time of 53 minutes. Annual sales for the restaurant in 2001 were $2,358,874.

Under baseline conditions, the restaurant made $775,617 per year during its nine hot hours. Thus, about one-third of its annual revenues were made during its nine weekly hot hours.

Then, the potential impact of a 20-percent increase in seat occupancy and a 5-minute decrease in dining duration was assessed. If hot seat occupancy increased from 50 percent to 60 percent and dining duration remained the same, the annual revenue potential would increase by $155,123 [((.6 - .5)/.5) * $775,617]. On the other hand, if hot dining duration deceased from 53 minutes to 48 minutes and seat occupancy remained the same, the annual revenue potential would increase by $80,793 [((53 - 48)/48) * $775,617]. Finally, if seat occupancy increased from 50 percent to 60 percent and dining duration dropped to 48 minutes, the annual revenue potential would increase by $252,076 [(.6/.5 * 53/48 -1) * $775,617]. Even if only half of that potential revenue ($126,000) could be achieved, the restaurant would experience a 5-percent increase in annual revenue.

Step #4: Implementation

Implementation largely revolved around training staff and implementing the new table mix. The management team began the process by giving all staff members a briefing on revenue management, showing them some of the results from the baseline analysis (particularly the time study results), and splitting them into function-based teams (i.e., all servers, all bussers, all kitchen staff) for discussion of possible approaches to resolving observed problems. This team-building approach served the restaurant well. The staff members bought into the revenue-management program, and managers were able to obtain many useful ideas in the ensuing discussions.

Based on the discussion sessions, management decided to increase the emphasis on pre-bussing in training, to reinforce the need for pre-bussing for existing employees, and to improve managerial oversight of this process. In addition, management decided to train all servers on the importance of quickly processing the check and on picking up the completed check folders from the table.

Since part of the problem with the payment process seemed to relate to technology, the chief information officer of the Chevys chain decided to investigate other technological solutions to the slow processing times. A particular problem was the restaurant's mall location, which meant that it competed for credit-card-processing time with the mall's many stores. If Chevys could obtain a dedicated payment server, it could improve check-processing time.

Table Mix

Because the restaurant had been open for more than nine years with no updating, the corporate staff decided that the redesign would not only involve reconfiguring the table mix, but also repainting the restaurant, relocating the host and service stations, and several other aesthetic improvements.

Management wanted an attractive design that allowed ample space for movement but did not make customers feel crowded. Constrained somewhat by the restaurant's footprint and the structural limitations of the building (several support pillars had to be maintained and the host stand couldn't be moved too far because of electrical considerations), the designer's initial plan fulfilled the requirements of maintaining the same number of seats and using the optimal table mix. To accomplish this the designer employed a variety of design approaches, such as half-walls, banquettes, high-top tables, and well-placed booths.

When the management team, the corporate team, and the designer evaluated these initial plans on site, they made several changes to accommodate the building's specific attributes and certain customer characteristics (for example, young families with babies had large carriages that needed ample space). The management team decided to adopt one of the near-optimal table mixes (thirty-nine 2-tops, thirty-five 4-tops, and two 6-tops) to achieve its goals of attractive design with attention to customer needs—an increase of 20 tables (but not more seats). The simulation results showed that this table mix would provide results within 1.3 percent of the optimal mix.[19]

Construction was set to begin the Monday after Valentine's Day 2002. The manager had wanted to start construction before Valentine's Day so that she could have the benefit of the added deuces on that occasion, but the corporate staff decided that the revised table mix coupled with the high Valentine's Day demand might prove difficult to manage. All construction was scheduled to occur during the hours that the restaurant was closed so as not to disrupt normal operations—which continued during the construction period. All half-walls and banquettes were constructed off-site so that they could be quickly installed.

Changes in the restaurant's table mix required adjustments in staffing, including new positions to accelerate operations.

The increase from 56 tables to 76 tables meant that more customers could be seated and wait time would be reduced. Offsetting those good outcomes, the new table mix increased the load on the kitchen, increased the number of servers required, and required the purchase of additional table supplies.

The reduction in wait time trimmed the buffer time that the kitchen had formerly enjoyed. To offset that problem, the restaurant's managers decided to add an expeditor who worked the middle line during hot periods (four shifts per week).

[19] Kimes and Thompson, working paper 04-23-03.

This person facilitated communication between the broiler line and the enchilada line to help speed delivery to guests. Two people were trained for this position at a rate of $9 per hour for the four shifts of three hours each, for a weekly cost of $108.

The additional 20 tables and new corporate rules on station size required the addition of approximately five server positions during hot periods, as the server stations were reconfigured into stations of four to five tables. The cost of the additional servers was $127.80 per week ($2.13 per hour for four three-hour shifts).

The additional tables also required additional tablecloths, plates, glasses, chip baskets, salsa dishes, Texas holders, and cutlery. The cost of the supplies (not including tablecloths) was $1,395.

Service-delivery Changes

As discussed above, the service-delivery improvement strategies focused on the end of the meal—specifically, the payment and bussing processes. Changes involved improved training, more diligent management, and certain additional staff.

Entrée delivery to check requested. The baseline time between the entrée delivery and the check delivery was approximately 23 minutes. The team did not wish to rush guests, but believed that better pre-bussing would move the meal along a bit more quickly. For this reason, both servers and bussers were trained to do a better job of pre-bussing. In addition, the store management hired a stacker, who was responsible for scraping and stacking all used dishes for the dishwashers. This position's pay was $5.15 per hour for the four hot shifts of three hours each, for a weekly cost of $61.80.

Check requested to change returned. In the test it took nearly six minutes from the time the check was requested to the time the change was returned. In an effort to trim that time, servers were trained either to drop the check upon clearing the entrée or to be alert for signs that the guest would like to leave. In addition, as I explained above, the corporate office sought to speed up the slow credit card authorizations.

Change returned to customer departure. It originally took about four-and-a-half minutes from the time the change was returned until when customers left. The management team found that many customers did not want to leave their credit card receipt on an empty table and stayed at the table until a server came to pick up that receipt. Consequently, servers were trained to pick up the completed check folder as soon as the customer was done with it. In addition, the team hoped that the enhanced pre-bussing would signal the customer that it was time to leave.

Customer departure to completion of bussing. In the test run, it took nearly three minutes to clear and reset a table. The major cause of this delay was the lack of pre-bussing by servers and the small space available in the kitchen. Improved pre-bussing and the stacker position would help reduce this time.

Step #5: Evaluation

About a month after the restaurant had been operating with the new table mix and revised procedures, its performance was reevaluated. Specifically, updated POS data were collected so that seat occupancy, RevPASH, and meal duration could be recalculated. In addition, a new series of time studies was conducted. Finally, a financial analysis was performed.

Additional POS data were collected to determine the change in seat occupancy. During the pre-test period, seat occupancy during the hot periods averaged 50 percent with a peak occupancy of 55 percent, while during the post-test period, average seat occupancy during the hot periods increased

to 59 percent with a peak seat occupancy of 82 percent.

RevPASH showed a similar improvement. Average RevPASH for the hot period during the pre-test period was $5.85. It increased to $6.32 during the post-test period.

Another series of time studies (82 observations) was conducted to analyze the effects of the duration-management strategies that had been adopted. The mean meal time dropped from 53:15 during the pre-test period to 50:56 for the post-test period. The standard deviation of total meal duration dropped from 22:46 to 15:09. The goal of a five-minute drop in dining duration was not achieved, but the variation was decreased considerably.

Most duration-management strategies had focused on the end of the meal. The team noticed considerable time reductions in that segment of the meal, although all meal parts were tightened. Decreases were noted in the following areas (numbers in parentheses refer to the variation, or standard deviation, in the mean test times):

(1) *Seat to greet:* pre-test: 2:20 (2:01), post-test: 1:38 (1:30). The restaurant dropped this time by 42 seconds and reduced the standard deviation by 25 percent. This could be attributed to the improved training and awareness.

(2) *Entrée to check dropped*: pre-test: 22:41 (12:19), post-test: 21:47 (6:44). The total time dropped by about a minute, but the standard deviation went down by over 40 percent. This can be attributed to the improved pre-bussing.

(3) *Check dropped to change returned:* pre-test: 5:40 (2:55), post-test: 2:55 (1:56). The restaurant was able to cut this time nearly in half and was able to reduce the standard deviation by over 60 percent. This can be attributed to training and the enhanced awareness of the servers of the importance of this process.

(4) *Change returned to departure:* pre-test: 4:27 (6:38), post-test: 4:09 (5:09). The restaurant did not have complete control of this time, since customers choose when they want to leave. The time decreased slightly, as did the standard deviation, which may indicate that the emphasis on picking up the check folder had worked.

(5) *Order to entrée:* pre-test: 11:31 (5:06), post-test: 11:25 (4:06). While this is not a substantial decrease in time, the fact that the kitchen was able to maintain the same time to prepare and deliver entrées even with the increased number of customers from the new table mix was impressive. Restaurant managers attributed this to the strong kitchen staff and its willingness to experiment with various approaches to handling the increased demand.

The focus had been on tightening the end of the meal, and that focus showed in the results. In contrast to the other meal segments, two of the pre-dining times (greet to drinks, drinks to order) increased—representing areas for future improvement. Also, the restaurant had been doing an excellent job of reseating tables once they were cleared. This time increased by 10 seconds from pre-test to post test.

The restaurant's new table mix increased peak seat occupancy by nearly 50 percent.

Financial Analysis

Although the estimated target was a 5-percent increase in revenue, it was necessary to test the actual effects of the process-control tactics. Since RevPASH had increased, restaurant revenue had increased, but it was unclear whether that increase stemmed from the revenue-management project or because of other, general market conditions. To control for this possibility,

financial performance for both the Arrowhead restaurant and two other Chevys restaurants in the same market was analyzed. For the seven weeks before implementation, the Arrowhead outlet had experienced a 5.7-percent drop in revenue (comparing 2001 to 2002), while the other two restaurants had suffered a 10.6-percent drop.

A similar RevPASH analysis was conducted after the new table mix and other measures had been implemented. The Arrowhead restaurant had experienced a 2.0-percent increase in revenue from 2001 to 2002, while the 2002 sales for the control restaurants were 8.0-percent less than the same period in 2001. Thus, the Arrowhead outlet had realized a 7.7-percent increase in revenue from pre-test to post-test, while the comparable restaurants had increased sales by 2.6 percent. The difference (5.1 percentage points) was attributed to the revenue-management interventions.

The new table mix and customer-volume changes were not without cost. The remodeling cost approximately $49,000, additional small wares cost approximately $1,400, and labor costs increased by $15,000 per year.

The Arrowhead restaurant had approximately $2.4 million in sales in 2001. Based on the projected increase of 5.1-percent calculated above, there was an estimated annual sales increase of approximately $122,000. Chevys had a 45.5-percent EBITDA flow-through, which meant that approximately $55,000 of this amount would go to the bottom line. The total cost of the project was around $50,000. The restaurant calculated its cash-on-cash return at 107.7 percent with an 11.1-month payback.

Summary and Conclusion

By implementing revenue-management tactics, Chevys Arrowhead has been able to increase revenue by approximately 5 percent. The improved table mix, the changes in the service delivery, and the improved training led to the improvement in the restaurant's performance. Seat occupancy and RevPASH increased, dining duration and variation decreased, and revenue (and, hence profitability) increased.

Other restaurant operators could realize similar results by carefully analyzing their current performance, determining the causes of that performance, and developing appropriate strategies to improve it. Changes in table mix and problematic service-delivery processes hold particular promise, but only with proper implementation that emphasizes training, employee buy-in, and enhanced management. ■

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