

# CHAPTER 1

## WHERE DESIGN BEGINS

The restaurant can be compared to any complex system that depends on all its parts to function correctly. Metaphorically speaking, it is like a desktop computer. What people see are the monitor, keyboard, and central processing unit (CPU) box, along with peripherals such as printers and scanners. The keyboard is a simple input device, while the monitor and printer are output devices. What makes the computer work is the seamless, complex interaction of the internal hardware components of the CPU and the software—both the operating system and the various programs. If any of the hardware or software components fails to work properly, the computer crashes.

The same holds true for the individual parts of a restaurant. The front and back of the house are meaningless without one another. All spaces in the restaurant should be considered not only on their own terms but also with respect to how well they perform in relation to the whole. This means that the front and the back of the house (even if they are designed by different parties) must work together seamlessly.

All too often, however, the two halves of the restaurant are designed by separate people looking at the space from different doors: the foodservice consultant from the back door and the interior designer or architect from the front. Each ends his/her involvement at the swinging door between the two spaces.

The truth is that both sides of the door are influenced by the restaurant concept and by one another. If the front of the house is not designed to support the back of the house, or the back of the house is not designed to carry out the concept expressed in the front of the house, then the operation suffers. For instance, picture a classical kitchen with a full battery of ranges, ovens, steamers, broilers, and so on,

all geared to produce a comprehensive menu for a gourmet restaurant. A typical quick-service layout—including an ordering queue—would be an obvious mismatch with this classical kitchen and would result in financial disaster for the restaurant.

Another mismatch example is the inclusion of a bank of deep-fat fryers in the kitchen of a café serving spa cuisine. The deep-fat fryers are a costly and space-wasting mistake because fried foods are infrequently found on this type of menu.

Unfortunately, mismatches occur often because the restaurant concept and the menu are not fully developed prior to design programming. The secret to a good relationship of concept, menu, and design is to conduct a careful market study and menu analysis before determining specific design elements in either the kitchen or the dining area.

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Successful restaurant design should be based on a complete feasibility study that covers the following 10 areas:

1. Type of restaurant
2. The market
3. Concept development
4. Menu

5. Style of service
6. Speed of service
7. The per-customer check average
8. General ambience
9. Management philosophy
10. Budget

Only when these 10 points are fully defined can an integrative design—resulting in a good match of front and back of the house—be realized. These points should be considered at the start of a project, before arriving at layouts and specifications. During the design process, subtle changes can be made to the feasibility study. For example, during the process, ownership discovers that the monthly lease cost for the pad on which the restaurant will be built has increased 10 percent due to a hot real estate market. Obviously, the budget will need to be adjusted to reflect this increased fixed cost, but subtle changes to the menu—which will lead to a high check average intended to cover the additional monthly cost—may need to be made. A helpful source of average restaurant performance statistics is the annual Restaurant Industry Operations Report, published by the National Restaurant Association and Deloitte & Touche, LLP.

## THE TYPE OF RESTAURANT

One of the first decisions made about any foodservice space concerns the type of restaurant. Defining restaurant type is not easy. On a simplistic level, one might say, “I want to open a sit-down restaurant.” But what exactly does that mean from a design perspective? For example, that sit-down restaurant could fall within any of the following categories:

- Freestanding or within an existing structure
- Independent or chain
- Eat-in only or with a takeout station
- Theme or nontheme
- Ethnic or generic
- Combination

The type of restaurant can also encompass market segment classifications such as quick service, coffee shop, hotel

dining, family restaurant, entertainment restaurant, and corporate cafeteria. The direct correlation between the type of restaurant and choice of kitchen equipment is obvious. A Chinese restaurant, for example, calls for different equipment than a seafood family dinner house. Every Chinese restaurant needs, for example, specific ranges designed to hold woks. But front-of-the-house design elements are not nearly as easy to determine. A Chinese restaurant may hint at a particular color palette and design theme, but not all successful Chinese restaurants are festooned with red dragons and smiling Buddhas (Figure 1.1).

## THE MARKET

The importance of conducting a thorough market analysis before embarking on a restaurant design cannot be overemphasized. The most spectacular design, the most delectable food, and the finest service can fail to save an establishment that doesn’t meet the needs of the marketplace. A good market analysis looks at four main components: potential customers, competition, location, and the economic environment. They are all interrelated, but each should be thoroughly analyzed.

## POTENTIAL CUSTOMERS

Identifying the demographic and psychographic profiles of potential customers is crucial for restaurant design success. Demographic information can be fairly easy to obtain. Data such as family income, age distribution, education levels, and home ownership describe part of the picture about potential customers. Such data are available from the U.S. Census Bureau and local economic development offices. A number of online services sell data for any market. Users can choose the exact size of the geographic market from which they intend to draw customers and receive the data via mail or over the Internet. Many recent designs have been targeted to the markets referred to as Generation X, who will range in age from 29 to 49 in 2010; Generation Y—alternatively called the Millennials, the Echo Boomers, or the Internet Generation—will range in age from 10 to 32 in 2010. They have expensive tastes, love going out to restaurants, and are ideal targets for high-designed restaurants where decibel levels are off the charts and ambient light levels are low.



Figure 1.1  
Subtle thematic references can, at times, be more effective than overdone clichés. Here, the artwork and table settings in an Asian restaurant designed by Anthony Eckelberry set the stage for diners.  
(Photography by Anthony Eckelberry)

However, design teams should not forget the enormous bubble of Baby Boomers (Figure 1.2), who are nearing retirement. Those who have planned well for retirement will have more time on their hands and will seek out restaurants where they will feel comfortable. Lighting levels should be higher in restaurants that cater to Boomers. Care must be given when designing the menu to ensure that the print offers sufficient contrast with the paper so that in dimly lit dining rooms, Boomers can still read the print. Excessive background noise makes it difficult for many Boomers to hear conversations around the table.

The psychographic information—which reveals consumer behaviors—tells an even more compelling story than the more simple demographics. Psychographics reveal how often the targeted customers actually dine out and how much they spend when they dine away from home, and identifies the type of restaurants they frequent. Some of these data can be obtained through consumer surveys, although those are costly. Credit card companies such as American Express sell detailed data on the purchasing habits of consumers, broken down by geographic markets.

In some situations, the customers to be served at one meal are totally different from those served at another. This is particularly true of hotel restaurants (Figure 1.3). In all-suite hotels, for instance, breakfast is usually included

in the price of the room and served almost exclusively to hotel guests, but lunch usually draws a local business crowd. Many popular restaurants in urban areas serve lunch to a neighborhood business clientele and dinner to a far-flung group of patrons who journey to the restaurant from around the city.

In such instances, design needs to suit diverse groups of customers if the restaurant is to succeed. A room designed as an attractive backdrop rather than an imposing statement can accommodate different tastes. Changing certain elements for each meal period, such as tabletop appointments or lighting levels, can also alter the mood of a room. Flexibility is a crucial design factor in both kitchen and dining areas for establishments that serve a wide spectrum of customers.

The impact of the Web on restaurant design will continue to grow. Customers, be they local, tourist, or business travelers, increasingly use the Web to preview restaurants prior to making a reservation. The Web affords potential customers an opportunity to preview the menu—food and beverages—including photos of individual plates of food. Additionally, multiple views of the restaurant interior (and exterior shots where the seating areas or architectural elements are a signature element of the design) have a major impact on informing potential customers.

The plethora of food shows on television—be they local programming, Bravo, or the Food Network—have kindled interest in upscale food preparations and created celebrity chefs, in a way that no other media ever could. Consumers are also introduced to new cooking techniques, as was the case in the second season (2006) of Bravo TV's *Top Chef*. One of the contestants frequently relied on molecular gastronomy techniques to create his dishes. The hit program *Iron Chef America*, with roots in Japan, has also enlightened Americans about myriad “secret ingredients” and, without question, gave celebrity status to the competing chefs. Twenty-five percent of the grading for each contestant is based on the design of the dishes that were presented.

A final consideration is generational differences. Suffice it to say, the Gen Xers (for the most part) are heavy users of technology. Some of them seem to be connected at all times—be it on their cell phones, laptop computers, or the next new chip-based technology. As long as Moore's Law—which roughly says that the number of transistors that a single microchip can hold doubles every 18 to 24 months—is true, new technologies will need to be considered as a part of the design process. These new technologies will impact customers and designers alike.

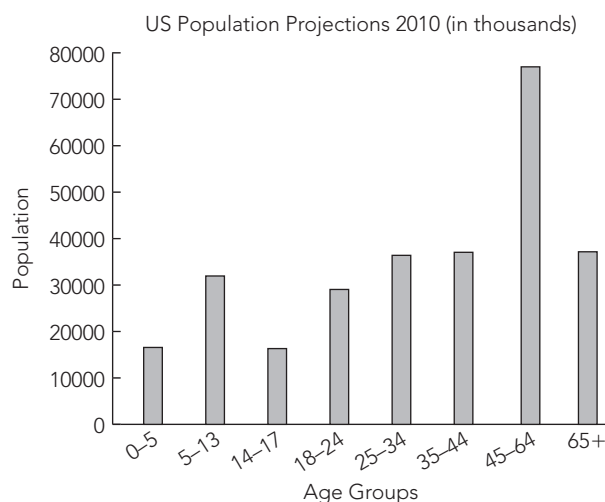


Figure 1.2

This U.S. Census Bureau population estimate for 2010 projects potential customers per age group. When looked at over time, population projections can also anticipate potential labor shortages.



Figure 1.3

Table 45 in the Intercontinental Hotel at the Cleveland Clinic was designed by Bill Blunden to attract medical professionals for breakfast and lunch meetings, and families who want to be close to a patient for evening meals. The multiple spaces appeal to different parts of the day.

(Photos by Scott Pease)

## ETHNIC, RELIGIOUS, AND CULTURAL EXPECTATIONS

One must consider the ethnic and religious beliefs of the various groups within the target market. Failing to do so could produce a restaurant design that has a limited audience. For example, barbecued rib restaurants do well in the Southeast; however, the market would be severely constrained in certain areas around Detroit where a population of more than 200,000 Muslims—66 percent of whom are first generation—live, work, and dine out. The Muslim taboo on alcohol should also inform restaurant design in those same areas. A sensitivity to Feng Shui should be considered where the market includes a large population of Chinese customers.

The fastest-growing ethnic population is of Hispanic decent. In areas with a high density of Hispanics, this fact should help shape both the restaurant's menu and its design.

## THE COMPETITION

Sizing up the competition is critical to a good market analysis. It starts with identifying both the primary and secondary competition. Primary competitors are those restaurants located in close proximity that offer the same or similar type of food and service as the proposed restaurant at a comparable price point. In rural settings, identifying the primary competition is easy, but in suburban and urban settings, this can be challenging. For example, a proposed

restaurant in the northern Chicago suburbs will compete with all of the similar restaurants that lie along the driving route of commuters as they head home from work.

Secondary competitors encompass the different types of restaurants located nearby. Even widely divergent types—quick-service and gourmet, coffee shop and entertainment extravaganzas—should be considered potential competitors. However, the major secondary competitors are those restaurants that have a check average and style of service similar to a proposed restaurant.

Both data gathering and data analysis can be complex. Studies should indicate the financial health of competing restaurants and their volume of business. Shopping the competition by checking out their parking lots and observing their waiting area during meal periods can provide important details about an operation's popularity.

Every effort should be made to find out what developments are planned for the neighborhood in question. In some cases, choosing to locate a restaurant close to others is a good strategy. The chain-restaurant row adjacent to suburban malls is one example of where clustering restaurants tends to work well. The challenge is to create a unique identity for each establishment.

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For example, consider a strip of roadway where a Red Lobster is followed by a Bugaboo Creek, an Olive Garden, and a regional seafood restaurant. Each has roughly the same check average and style of service; the distinctions are in menu offerings and design. In the case of Red Lobster, the seafood theme is played down and the decor is simple and unobtrusive. Olive Garden plays up its Italian theme with grapes on the menu and colors of the Italian flag. Bugaboo Creek's heavy wood elements, rough edges, and animatronics appeal to families with young children. To stand out from Red Lobster, the regional chain restaurant has a lavish seafood display in its entryway; a cue to customers that they will be eating fresh fish. The display also supports retail seafood sales for at-home preparation. In this case, additional thematic elements, like wallpaper imprinted with nautical images, can further differentiate this seafood restaurant from Red Lobster.

What looks like a hot market today when only two restaurants are open could quickly turn cold when eight more family casual restaurants open their doors within 24 months of each other. The wise design team will gather data on any commercial property in the area that could accommodate a restaurant and keep close tabs on the appropriate government office that oversees building permits or land-use regulators in an effort to project what the future competition could be like.

## LOCATION

"Location, location, location," the adage coined decades ago to express the key to business success, remains as true as ever. The ability to recognize a location that is suited to a particular type of restaurant is a crucial market factor. Location is typically defined as a geographic place. The close proximity of that place to a targeted customer base makes it desirable.

Location also gives clues to customer demographics and, in some cases, customer psychographics. For example, the sleek design of the Chinese-inspired Buddakan restaurants in Philadelphia and New York City would likely fail miserably if transplanted to Omaha, Nebraska, because rural Midwesterners look for different kinds of dining and design experiences than trendy New York City restaurant goers.

Architecture is influenced by location as well. Freestanding restaurants in the middle of Manhattan or Chicago are rare. Moreover, different regions call for different architectural styles. The pitched roofs found in New England are there to keep snow from collecting on the roof. Typical southwestern architecture uses adobe—an indigenous material—to insulate the building from the hot summer sun. The point is to avoid grafting architectural style onto an unsympathetic environment.

Successful restaurant architecture works in context with its location (Figure 1.4). In renovations of an existing structure with architectural merit, it seeks to embrace the elements of that structure in the design rather than cover them up. Examples of this are Farallon in San Francisco, where the Pool Room dining space incorporates the vaulted ceiling with its original circa 1925 mosaic ceiling depiction of mermaids that capped the former two-story space above a pool that is still located in the basement of the building.

The geographic location also affects kitchen design decisions. In many urban settings, for instance, food can be purchased daily, but in more remote areas, larger storage



Figure 1.4

Architecture in context: As an homage to the noted architect Louis Sullivan, architect Warren Ashworth incorporated an overscaled arch on the entry to the restaurant.

*(Peter Wynn Thompson Photography)*

facilities are needed to hold food for a week or more, so extra storage space must be factored into the floorplan.

Location also affects the availability of utilities. Urban restaurants typically have access to natural gas for cooking, some can access a city-generated steam supply, and electricity is available at several voltages. However, in rural areas, a restaurateur may have access only to bottled gas—which puts out 25 percent less heat than natural gas. Electric equipment that runs on 110-volt or 220-volt single phase should pose no problems in any location, but a 3-phase 220-volt power supply is not available everywhere; upgrading that service can be costly.

Traffic patterns should be taken into consideration when picking a location for a new restaurant. For example, a restaurant that targets breakfast customers is best located

on the inbound side of the road heading into a city or other concentrated employment area, such as an industrial park. Conversely, a restaurant that targets dinner guests or people looking to pick up a home meal replacement after work can benefit from a location on the outbound side of the roadway. The ease with which drivers can exit and return to limited-access highways is also important.

## ECONOMIC CONDITIONS

Finally, a market analysis should consider regional, national, and, in some cases, international economic conditions. The economic climate tends to influence restaurant longevity. In volatile times, planned obsolescence can be the key to a restaurant's success. In the early 1980s and 1990s, for example, the economic picture was such that restaurants designed for a short but popular lifespan gained a competitive advantage. In these cases, front-of-the-house design elements were chosen primarily for their up-to-the-minute look, not for their enduring value. But by the mid-1990s, economic stability and prosperity encouraged more durable designs whose high style did not eclipse comfort. In this millennium, the economic conditions have been on a roller-coaster ride beginning with the downturn (a.k.a. mini-recession) that began in 2000 and was driven down further by 9/11 and the military incursions overseas. Clearly, opening a restaurant during an economic downturn could have a negative effect on a restaurant's chances for success. As can be seen in Figure 1.5, economic conditions are somewhat cyclical. While unexpected social or political occurrences cannot be predicted, the general trends of the economy can be forecast out to 24 months with high accuracy.

Market indicators such as housing starts can help pinpoint the economic strength of a given area. Traffic counts maintained by state transportation departments are valuable for rural and suburban restaurants. Because most customers use their cars to reach restaurants in nonurban locations, increases in traffic count tend to foretell increases in restaurant sales. The trends of the bond market should also be considered. As the cost of capital increases, the prudent restaurateur looks for architecture and design that helps minimize capital costs.

Another point to keep in mind is that the market is cyclical. A drop in interest rates can be a great time to upgrade equipment or undertake a renovation.



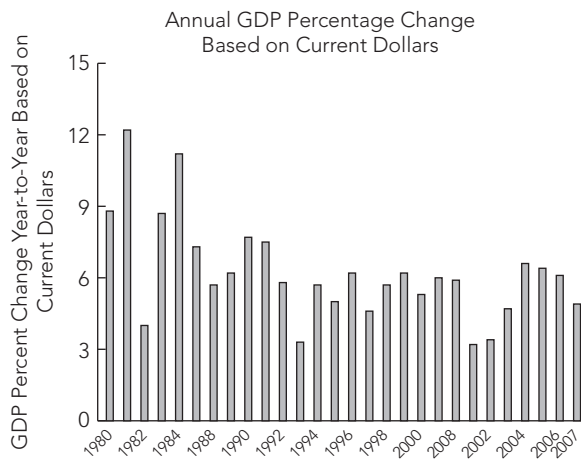


Figure 1.5

The gross domestic product (GDP)—an important indicator of domestic economic conditions—is somewhat cyclical as can be seen in this figure. Opening a restaurant during an economic downturn can be a challenge for even the best designed restaurants.

Communities that rely heavily on a single employer can pose problematic economic challenges. When the main employer downsizes, less discretionary money is available for dining out, and those who are still employed tend to tighten their belts to save for the time when they might be laid off. Urban restaurateurs should be similarly concerned if their operation appeals to a single business segment, like Wall Street brokers or advertising agency personnel.

## CONCEPT DEVELOPMENT

With a clear understanding of the market, one can begin to develop the restaurant concept. The answers to four initial questions yield vital background information:

1. What experience does ownership have in the restaurant business?

Owners with a great deal of experience are better able to work with a complex menu, service, and design concept. Those with little experience are better suited to a small

operation with a limited menu and simple decor. That said, some celebrity chefs with multiple restaurants in their portfolio, or profitable chain restaurant companies with many restaurant brands, can contradict market conditions.

2. For a restaurant renovation, is the goal to freshen the look of an ongoing business or create an entirely new personality?

A renovation can be as simple as adding a coat of paint, changing ceiling tiles, and installing new wall sconces. More significant design alterations are required to change the personality of an existing restaurant into an entirely new concept. The simple renovation may be small enough to absorb into the ongoing operating costs. Creating a new personality for a restaurant requires a greater capital investment, which may necessitate increasing revenues through price increases.

3. For a new restaurant, is the building freestanding or part of an existing structure?

When building from the ground up, both exterior and interior architecture can be easily planned to support the concept. Creating a concept for a restaurant built within an existing structure can be more challenging because the space limits the designer's flexibility. In this case, it often makes sense to develop a concept that is compatible with the existing architecture. For example, it would be difficult to create a 1950s diner theme in a cavernous loft space punctuated by columns.

4. If ownership has not established a firm concept, then who will develop the concept—interior designer, architect, restaurant manager, or foodservice consultant—or will many parties collaborate?

While input from many players can be valuable, it can also lead to confusion or a loosely defined concept. For example, the chef may want to focus on the tabletop, with dramatic lighting that highlights artfully arranged platters of food in the center of each table. The manager, seeing a greater contribution margin coming from the bar, may want to downplay the food end of the business and position the bar as the heart of the concept. The interior designer may seek to create a strong visual impact by spending the budget on dramatic architectural elements like a soaring staircase or dramatic entry.



### QUESTIONS TO ASK BEFORE DEVELOPING THE CONCEPT:

- What experience does ownership have in the restaurant business?
- For a restaurant renovation, is the goal to freshen the look of an ongoing business or to create an entirely new personality?
- If a new restaurant, is the building free-standing or part of an existing structure?
- If ownership has not established a firm concept, then who will develop the concept—interior designer, architect, restaurant manager, or foodservice consultant—or will many parties collaborate?

A concept is multifaceted and involves every aspect of the operation. It can revolve around a theme that has easily identified in-your-face visual elements—a seafood theme with hanging lobster traps or a Mexican theme with cacti and oversized sombreros, for instance. However, other theme restaurants reflect a subtler approach—suggestions of a theme that give diners a feel for what they are about to get but leave a bit to their imagination. A display of fresh seafood coupled with architectural elements reminiscent of a cruise ship hint of the meal to come. Beginning in 2007, Red Lobster undertook a major redesign of their restaurants with a new look intended to evoke the Maine Coast. This change was matched with extensive television advertising in an effort to communicate to the market that Red Lobster was changing the way it operated.

The adobe walls, pottery, tiles, and courtyard fountain of a Mexican villa-style building prepare the diner for a south-of-the-border experience without screaming the message. Oversized Japanese Suiboku paintings on the wall clearly suggest an Asian food experience. These kinds of thematic references often engender a sense of realism, while the stronger reference can be perceived as pure kitsch. In many cases, theme is expressed both in the interior and on the exterior of a restaurant (Figure 1.6).

In other instances, historic recreations evoke an authentic sense of place. Period design can range from a turn-of-the-century hotel dining room to an Art Deco cruise ship motif to a 1950s diner. Ingenious use of design can help an

unadorned modern building take on the character of another era, and genuine restoration or renovation can transform the restaurant into a kind of living museum. For example, in the restaurants at Williamsburg, Virginia, and Sturbridge Village, Massachusetts, the costumed waitstaff, original 18th- and early 19th-century architecture, and authentic period cuisine transport customers back to colonial times.

Strong themes have become the core concept for many chain restaurants. Hard Rock Cafe depends heavily on celebrity memorabilia to create its sense of theme. The entertainment concept of the Rainforest Cafe is supported with “boulder”-lined walkways, tropical flora, and periodic visits by animatronic creatures from the wild.

Concept can also revolve around a nontheme—an idea, an image, a shape, a pattern, an architectural style, or a central element that pulls together the concept. In Manhattan’s classic Four Seasons restaurant, designed by Philip Johnson in 1959, the modern architectural backdrop of the Seagram building, designed by Mies van der Rohe, influenced every aspect of Johnson’s cool, clean, timeless interior design scheme.

In many popular restaurants, the concept combines a food idea with a design idea. Pick a patriotic name and theme, and it makes good sense to roll out a menu that incorporates regional American cuisine. Similarly, a restaurant called Catch of the Day creates the expectation of a seafood restaurant—although if it sits next to Fenway Park in Boston, the name could imply an after-the-game menu.

Sometimes the food concept is dominant, and design functions as a backdrop for the chef’s art. These establishments utilize such devices as partially open kitchens to allow patrons a view of the cooking process. Dining rooms are often designed in neutral palettes that permit the plate presentation to be the main attraction.

Exterior architecture often becomes an integral component of the concept itself. Historically, elements such as Dairy Queen’s gambrel roof, Howard Johnson’s orange roof, and the ubiquitous golden arches of McDonald’s exemplify architecture as a symbol of the restaurant. Vernacular roadside architecture literally portrays the concept (Figures 1.7 and 1.8).

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Figure 1.6

Theme is critical to Bembos in Peru, designed by José Orrego Herrera, where the exterior expresses the bright colors and high energy found in the interior.

(José Orrego Herrera)



Figure 1.7

This Rainforest Café exterior suggests that a different kind of experience awaits inside.

(Photo by Joseph Durocher)



Figure 1.8

The exterior of the Hilltop Steakhouse, in Saugus, Massachusetts, with its faux gambrel barn roof and its seven-story Hilltop Steakhouse sign, is a form of vernacular architecture.

(Photo by Joseph Durocher)

## THE MENU

Menu planning is integral to restaurant development. Some chefs and owners feel that the entire operation should revolve around the menu. However, all too often the menu is not planned in advance of the concept and the design. In fact, the chef is frequently brought on board long after construction is under way. The chef's input can improve both front- and back-of-the-house design; likewise, his or her absence can lead to subsequent problems.

It also helps if various members of the design team know something about menu planning. The first fact to consider is that, ultimately, diners mandate what stays on the menu, regardless of restaurant type. Owners, chefs, and foodservice consultants may have a penchant for certain types of foods, but if they do not tailor their preferences to customer demand, the restaurant may soon be out of business. Restaurateurs who believe that they are in the business of educating customers about cuisine will find themselves fighting a long uphill battle. This is why operators often change at least 50 percent of the menu within the first six months of operation and why selecting equipment that affords flexibility in menu planning is important.

Unquestionably, menu offerings affect consumer behavior and affect the decision of whether to eat at or return to a particular restaurant. Menu changes, albeit costly, can become necessary for many reasons. The menu may not conform to the production or service capabilities of the facility. A health-conscious clientele might place an overwhelming demand on the one overworked steamer that cooks seafood and vegetables, while several fryers sit unused. Regardless of the reason, a change of menu—and, hence, of kitchen or front-of-the-house design—should always be factored in as a possibility during the planning process.

Food may not be what brings people to a restaurant the first time. The lure might be an eye-catching exterior design, a great media review, or a word-of-mouth recommendation. However, food is, in large measure, what keeps people coming back—and anything that can be done to improve customer perception of that food is important. Diners want hot food hot and cold food cold, for example. Anything that gets in the way of this basic goal will lose customers. Servers prancing through the room with uncovered plates of artfully arranged foods may be a great merchandising technique, but it will backfire if the food isn't hot when it arrives at the table.

## THE SPEED OF SERVICE

Speed of service and turnover rate are closely allied. Quick-service operations have the highest turnover rate—that is, guests occupy a seat for the shortest time. Tables should turn over every 15 to 20 minutes in quick-service restaurants. In cafeteria operations, customers take more time to get their food and the turnover rate is a bit slower: 15 to 30 minutes. The full-service dining experience, particularly in expensive restaurants where multiple courses are cooked to order, is the lengthiest; customers wait the longest for their food and spend the most time eating it. Turnover can range from about 30 minutes in a roadside diner to 4 hours in a gourmet establishment.

The amount of time a customer spends in a restaurant—both in getting food and in eating it—has design implications for both the front and back of the house. If customers are expected to dine on gourmet fare for an hour or more, then comfortable seating, such as upholstered armchairs, and an à la carte kitchen are in order. Conversely, if faster turnover is desired, then hard-surfaced chairs will help move guests out of the dining space as quickly as possible. Furthermore, the kitchen must be laid out, staffed, and fitted with equipment that speeds the preparation and service of food to the guests.

The type of point-of-sale (POS) system can markedly affect a restaurant's turnover rate. With today's POS systems, the ordering process and payment should be streamlined. Order-entry stations located throughout the dining area enable servers to place an order without traveling to the kitchen. Handheld order-entry pads coupled with credit card swipe and printer units can increase turnover rates even more. If the handhelds are linked to the table management system along with bar and kitchen printers and are part of a two-way communication system, speed of service is maximized. With kitchen printers, the entries are significantly easier for the kitchen staff to read—which, in turn, shortens the time it takes to prepare an order and decreases the chances of mistakes.

With the most sophisticated POS systems, pop-up menus mandate servers to include all the information needed to complete an order, like the degree of doneness, choice of accompanying side dishes, or the type of salad dressing.

Some restaurateurs have even placed order-entry units in the hands of guests. As the cost of these decentralized systems drops, more restaurateurs will incorporate them

into their restaurants when high turnover rates are desired, thus increasing space in the front of the house.

Speed of service is too often overlooked in the planning process. In one case, a group of owners, new to the restaurant business, approached the development of their pro forma statement without considering speed of service. They began with the following information:

Menu: continental  
 Style of service: leisurely plate and cart service  
 Number of seats: 235  
 Lunch turns: two per day  
 Dinner turns: five per day

Based on their projected fixed expenses, the owners determined that they would need \$74,000 per day in revenues. To achieve this, they calculated a per-check average by dividing the total daily sales by the total number of customers served:

$$\frac{\$74,000 \text{ required daily revenues}}{\# \text{ of lunch covers} + \# \text{ of dinner covers}}$$

The resulting \$45 check average was considered appropriate for this type of operation, and thus the project proceeded.

Neglecting to consider speed of service caused grave problems, however, because the restaurant could not meet the projected turnover rates and provide the leisurely dining experience expected with a \$45 check average. In other words, to meet the projected turnover rates, either the tables would have to be turned in less than an hour, or the total serving time for lunches would have to stretch over 4 hours and for dinners, over 10 hours. Management had failed to recognize the amount of dining time necessary in this type of establishment.

## THE PER-CUSTOMER CHECK AVERAGE

It is essential to consider the check average in concert with the other elements that contribute to the design concept. Here are two questions that need to be addressed:

1. Will a low check average dictate more turnover and thus a sturdy, low-maintenance design?

Low-priced menus usually lead to higher customer counts, creating the need for fast turnover. However, this must be considered in the context of the market. For example, an inexpensive quick-service operation might work nicely when located next to an industrial park where employees from various companies take half-hour lunch breaks that stretch over a two-and-a-half-hour lunch period. But if the quick-service restaurant sits next to a single manufacturing plant where the production line shuts down completely and everyone gets one hour for lunch, the chance of realizing multiple turns is minimal.

Where multiple turns are forecasted, durable, low-maintenance design makes sense because of the potentially higher volume of business. Where only one turn is projected, a low-cost design package is critical because the revenue stream cannot support a high-capital budget.

2. Is the cost of capital low enough to cost justify the high design costs associated with high check averages?

When the cost of capital is low, it is easier to cost justify building a large, upscale restaurant with more expensive menu items. Low capital costs also make it possible to upgrade the design without having to increase check averages.

The cost of the meal carries with it design expectations in the mind of the customer. People don't expect a \$4.50 meal tab in a luxurious environment replete with rich materials, nor do they expect to pay dearly for fine cuisine in a room that looks like a 1950s diner. Check average and speed of service must be carefully monitored and matched for successful results.

## THE GENERAL AMBIENCE

Before arriving at specific design solutions, define the type of atmosphere desired for a given restaurant. How should the customer feel in the space? Energized, ebullient, ready to eat and move on? Relaxed, at ease, comfortable enough to linger for hours? Stimulated? Cheerful? Nostalgic? Serene? Pampered? Protected? On display?

Obviously, different types of restaurants evoke different types of feelings. The feeling of dining in a homey neighborhood coffee shop differs from the feeling of dining in a high-designed corporate cafeteria, a gourmet establishment, or a theatrical grand café. These feelings are

a function not only of food and service but also of interior design and architecture.

## THE MANAGEMENT PHILOSOPHY

Management philosophy helps dictate design philosophy. In the case of the chain restaurant, for instance, the philosophy of corporate-level management is to maximize profits for the shareholders, who are looking forward to the next quarterly report. However, as reported in the article “To Woo Europeans, McDonald’s Takes an Upscale Turn,” by Julia Werdigier, in the August 21, 2007, issue of the *New York Times*:

*Sophisticated? McDonald’s?*

*The Golden Arches are going upscale. Aiming to create a more relaxed experience in a sophisticated atmosphere, McDonald’s is replacing bolted-down, plastic, yellow and white furniture with lime-green designer chairs and dark leather upholstery. It is the restaurant chain’s biggest revamp in more than 20 years and, together with its franchisees, it plans to spend more than 600 million euros, or \$828 million, remodeling 1,280 of its European restaurants by the end of this year.*

*... The changes are paying off. In the first half of this year, combined sales at Europe’s 6,400 restaurants rose 15 percent to \$4.1 billion, compared with a 6 percent increase in America, where McDonald’s has 13,800 restaurants, and sales totaled \$3.9 billion.*

Design updates can clearly impact sales even in the largest chain operations where design updates to all of the restaurants in a region can approach a billion dollars. Because of this, chain restaurants tend to be pragmatic, derivative, and safe in making a redesign decision. System-wide design updates are often delayed as the cost of renovation and lost sales during renovation on hundreds or thousands of restaurants can reflect negatively on the corporate balance sheet. On the other hand, the entrepreneur looking to attract a young, sophisticated clientele may take a chance on innovative design and architecture. Restaurateurs looking for the long-term growth of their business may invest most on design in the hopes of creating a classic design statement “with legs.”

For some owners, the throwaway restaurant is appealing. These are people looking to get into the business for a minimal investment, reap the revenues that often accompany a newly opened restaurant, then get out before the bottom line crashes. They then take their money and invest it in a continuing series of new, short-lived restaurants.

## THE BUDGET

The budget is nearly always a limiting factor in the design of a restaurant. A big design budget is only as big as the market will bear, and not even the best-financed project can afford wasted design dollars. However, adherence to a tight budget means little if the dining room looks tired and worn after two weeks of operation or if management can’t afford proper maintenance procedures.

Budgetary planning has inherent contradictions. Every owner wants to stretch design dollars as far as possible and not go broke before opening day. A restaurant is, after all, a business. However, modern consumers, many with a mind-set hungry for new visual experiences, increasingly view design as part of the value equation that they expect from restaurants.

The main problem with budgeting is that design is expensive. Further, good architecture takes time, and time is money. Of course, design is a relatively unimportant backdrop for food and service in some successful restaurants, and the charm of other totally undesigned bistros stems from their visual chaos. Such successes, however, are rare. Even simple interiors and rooms that appear to reflect time-worn patinas have often been designed—for a fee. Likewise, kitchen design is no free lunch, but back-of-the-house design investments can buy a layout that increases productivity and efficiency and returns more to the bottom line.

The costs of front- and back-of-the-house design vary wildly with location, type of restaurant, intended life span, and other factors. Basically, the owner pays for both goods and for services. Goods translate into furniture, fixtures, and equipment (FF&E). Services include fees for the schematic design concept, as presented in floorplans, elevations, renderings, and other architectural plans. Services also include the writing of FF&E specifications but not necessarily purchasing. Some design firms prefer to remain purely service oriented and leave the procurement and installation process to purchasing agents.

There is no uniform method of charging for design services. The design firm's fee may be based on square-foot costs, a percentage of total project costs, a consulting fee at hourly rates, or other methods. Many variables influence fee structures but, as a rule of thumb, most firms charge a fixed fee based on the scope of the job and on the total project cost.

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Some firms that provide purchasing services charge a percentage markup based on FF&E prices. Owners should beware of design thrown in "free" by equipment or purchasing houses whose profit comes from markups. The motivation may be to overequip the space in an effort to increase the markup profits.

Budget planning must begin in the early stages of the design process. The owner should develop an initial budget as a guide and agree on a final budget before any design contract is finalized. As the project progresses, the budget must be carefully monitored. Projects always have hidden costs, and renovation often presents more expensive surprises than new construction. In truth, any number of factors may drive up the costs of one or more elements of the construction budget, so contingency dollars should be built in.

A crucial aspect of budgetary control is how design dollars are allocated. Adding one dramatic design treatment in an otherwise simple room, for example, can elevate an ordinary interior to something special. However, other design elements may hike the design budget considerably but have little impact on customers.

The best practice is to invest money where one gets the biggest bang for the buck and to spend the most on items that customers come in contact with. Good design doesn't always mean expensive design, but fine furniture and finishes cost money. Applications like faux finishes can help control costs but, in an upscale restaurant, it is advisable to mix faux with fine finishes to create a balance. Sometimes it costs less to hire a muralist or furniture maker to create custom applications than it does to purchase fine art or furniture.

A good designer knows how to prioritize and how to take from one area and give to another in order to adhere to the total FF&E budget. If surprises raise costs so high

that the budget needs to be adjusted, the designer should inform the owner immediately. There's no excuse for running out of money midway through a project.

## EXPECTED RETURN ON INVESTMENT

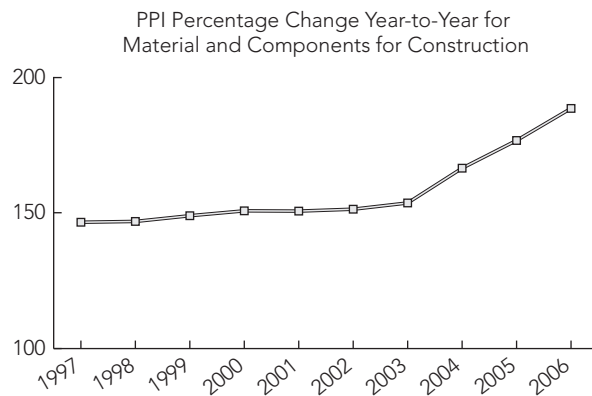
The design and construction budget must also relate back to management's expected return on investment (ROI). Any restaurant owner hopes for the highest ROI possible, but those owned by an investment group will probably expect the highest return—frequently in excess of 20 percent of their investment per year. The independent, however, may be using funds from noninstitutional sources so their expectations of ROI could be quite lower. If a restaurant is owner-operated with family pitching in on the labor front, they may forego salaries for a period to help the profitability of the operation.

Another factor in ROI can best be seen in a multiconcept chain. In some cases, earnings from one unit or concept within a chain can be used as seed money to launch another restaurant within the same chain or a new concept. Such an approach is most appropriate to privately held restaurant companies, although it is used in some publicly traded companies.

## CONSTRUCTION MARKET

Construction costs have risen steadily over the past decade, and there can be rapid rises in costs for certain materials when natural disasters occur, like Hurricane Katrina that struck in 2005. Labor and cost of materials are the two major contributors to restaurant construction project costs. Figure 1.9 tracks the Producer Price Index (PPI) for Materials and Components for Construction and shows that prices for all construction products: wood, concrete, steel—began a sharp rise in 2003. In times where prices rise quickly, it is important to add inflation factors into the construction budget estimates. The real estate downturn in the middle of the last decade significantly curtailed residential construction; however, commercial construction did not really feel the downturn until late in the last decade as measured by the Work-on-the-Boards Index published monthly in *AIArchitect*.





About PPI  
The PPI-Producer Price Index is published monthly by the US Bureau of Labor Statistics. A base of 100 was set in May of 1982. In 2003 this price index began a rapid climb.

Source: <http://data.bls.gov/cgi-bin/surveymost?pc>

Figure 1.9

An upswing in the Producer Price Index can, if not considered, lead to budget overruns for a project with a long lead time. Interim price spikes in material can arise from other than economic conditions (e.g., weather, earthquake).

Another factor that influences construction costs is based on where the restaurant will be built. The initial cost is the land or space rental. A second cost consideration is the variance in labor costs in different areas of the country. The *RS Means Building Construction Cost Data* publication that is updated yearly offers excellent insights into the relative difference in construction costs in various parts of the United States. Unit and square foot costs are also given so that accurate estimates can be made for a construction project.

## THE SYSTEMS APPROACH

### MARKET SEGMENTS VERSUS SERVICE SYSTEMS

How will the customers be served? Will guests help themselves at buffets, queue up as in a quick-service line, or be served at the table on individual plates or platters of food?

Will a combination of service styles be offered such that guests help themselves to some items while servers deliver others? The answers to these questions dictate specific spatial considerations in the design plan.

For example, full-service restaurants can have many styles of service: plate, platter, cart, buffet, or any combination of the four. Plate service, in which food is plated in the kitchen and then passed over to a waitperson who serves finished plates to the guest, requires the least amount of tabletop and dining room floor space. Platter service, in which food is assembled on platters and frenched (served onto a waiting dinner plate in front of the diner) requires larger tables and more floor space so that the server can manipulate the platter between the guests.

Cart service requires the most space, as the guéridons (service carts) must be moved around the dining room and kept at a safe distance from tables when flambé cooking takes place. When buffets are integrated in a tableservice restaurant, space for the buffet, circulation paths to and from the buffet, and space so that staff can restock the buffet must be considered.

Restaurants can be classified in many ways. Historically, classifications are based on check average, theme, type of cuisine, or market segment. Segmentation by market (Table 1.1) and food category (Table 1.2) are the most commonly used classifications in the foodservice industry.

But, from a design perspective, the market segment called hospitals is not at all descriptive and is only marginally helpful in the concept development. All hospitals feed patients in their room and probably have a cafeteria for the employees. But the similarities may end there.

A single hospital could also include an à la carte restaurant in space that is leased out; a quick-service court also in leased space or in a series of “outlets” run by the hospital foodservice; a buffet in the cafeteria; machine feeding for 24/7 availability; and even banquet facilities that double as in-service training space during the day.

Similarly, elementary school foodservice could consist of the standard straight-line cafeteria, a scatter system of individual food stations where students help themselves, or a quick-service system such as McDonald’s. Each of these types has different design implications, and the term *elementary school foodservice* does not give a clear picture of the operation.

Using the service system classification, the designer can accurately identify styles of service and types of food delivery systems. If, in the preceding example, the school board

**TABLE 1.1 MARKET SEGMENTS AND THEIR COMMON SERVICE SYSTEMS**

• Full-service restaurants	À la carte, family style, tableside, buffet, takeout, delivery
• Quick-service restaurants (fast food)	Fast food, takeout, delivery, drive-through, buffet, satellite
• Fast-casual restaurants	À la carte, fast food, takeout, delivery, buffet, satellite
• Elementary and secondary schools	Fast food, buffet, cafeteria, satellite
• Employee feeding	À la carte, fast food, takeout, banquet, buffet, cafeteria, satellite
• Hospitals	À la carte, fast food, takeout, banquet, buffet, cafeteria, tray, machine, satellite
• Hotels and motels	À la carte, family style, table service, fast food, banquet, buffet, tray, satellite
• Colleges and universities	À la carte, fast food, banquet, buffet, cafeteria, machine, satellite
• Military	À la carte, family style, fast food, takeout, buffet, cafeteria, machine, satellite
• Recreation facilities	Fast food, takeout, cafeteria, machine
• Convenience and grocery stores	Takeout, buffet, satellite
• Nursing homes	Cafeteria, tray, machine, satellite
• Transportation	À la carte, fast food, tray, satellite
• Retail stores	À la carte, fast food

**TABLE 1.2 FOOD CATEGORIES**

• Asian
• Chicken
• French
• Italian
• Latin American
• Mexican
• Middle Eastern
• Pizza
• Sandwich
• Seafood
• Steakhouse
• All other food categories

calls in a designer and says, “We want to put a foodservice operation in our new elementary school,” then the designer has little insight into the characteristics of the design. If, however, the board says, “We want a quick-service operation featuring healthy fast food in our new elementary school,” the designer has a well-established frame of reference to help determine which type of food delivery system is optimal. Similarly, the designer doesn’t have much to go on if a restaurateur says, “I want to open a steakhouse.”

The designer knows more if the restaurateur says, “I want to open an à la carte service restaurant with a steakhouse menu, salads prepared at tableside, and a buffet-style dessert bar.”

So it is the service systems (Table 1.3) that truly shape the design of a restaurant or other foodservice operation.

Describing a foodservice operation using a process-oriented approach can be more appropriate in the concept development of a restaurant than building the concept solely on a market of food category.

The term *service system* is loosely defined as the means by which food is prepared and delivered to the customer. At times, a foodservice operation combines more than one service system. This is called a complex service system. Each of these service systems needs its own set of subsystems to back it up. Subsystems include such functions as purchasing, fabrication, preparation, and assembly, to name a few. The functions performed and the layout of the subsystems vary with the type of service system or systems in a particular operation.

A general description of each service system appears below. While the variations to each may further inform the concept, the service systems will have the greatest impact on the final design. An understanding of each of the service systems is important because subsystem design flows from them.

**TABLE 1.3 SERVICE SYSTEMS**

Service Systems
• À la carte
• Family style
• Tableside
• Quick service (fast food)
• Takeout
• Delivery
• Drive-through
• Banquet
• Buffet
• Cafeteria
• Tray
• Machine
• Satellite system
• All other service systems

## À LA CARTE

In à la carte service, a waitperson takes orders from individual customers and presents them to the chef for preparation. For the most part, the preparation is done to order and, in every case, the food is plated specifically for a particular customer. À la carte service is frequently found in upscale restaurants, executive dining rooms, hotels, coffee shops, and other full-service operations. (It is sometimes referred to as table service, which does not convey information adequate to developing an effective design scheme.)

In the kitchen, high heat and quick-cooking equipment—like charbroilers and flattop ranges—are needed to support the cooking of sautéed, broiled, or fried individual portions of food. In addition, a steam table is needed to hold foods and sauces prepared in bulk.

## TABLESIDE

The key element in tableside service is the preparation or assembly of foods at tableside on a guéridon (cart). Raw or partially cooked food ingredients are brought to tableside where they are finished, plated, and served. Most often, tableside service combines with à la carte service, with one or two special tableside menu items, such as a Caesar salad or a flaming dessert, actually being prepared at tableside. A rechaud or butane burner is needed to cook or warm

items at tableside. Tableside service was a key service style in such venerable restaurants as Lutèce and La Côte Basque in New York City, and while many restaurants have moved away from this style, it is still a stalwart for operators who aspire to classic French haute cuisine.

Tableside in a dining room with multiple levels will not work as smoothly as one on a single level because it limits the movement of carts. The ventilation system must also be sufficiently upsized to remove the extra smoke and smells of tableside cooking. The timely coordination of foods coming from the à la carte stations of the kitchen and the tableside preparations must be timed perfectly.

One of the keys to successful tableside service is to measure and assemble all of the ingredients before they are taken to the dining room. This *mise en place* (“everything in its place”) requires additional refrigerated storage space in the kitchen.

## QUICK SERVICE

Customers queue up in either a number of lines or one serpentine line to place their orders. Typically, the counter worker takes the order, assembles the food, and receives the payment. This style of service is further characterized by speedy food delivery and the use of disposables. Chain and independent restaurants, elementary and secondary schools, employee feeding, hospitals, colleges and universities, the military, and recreational facilities are common market segments that include quick-service systems.

Most fast feeders batch-prepare foods. Warming equipment that maintains the quality of the prepared foods plays an important role in the kitchen. Many items are partially prepared and then custom finished when ordered. Freezer storage is critical, along with oversized dry storage to hold large supplies of disposables. Dumpster space is essential to hold the large volume of trash generated.

The front of the house needs enough space for customers to queue up and place their orders. Behind the order counter, space needs vary. In some cases, the order taker must handle cash as well as assemble orders. In other restaurants, different people handle cash and order assembly. In some, 80 percent of the sales will be made at drive-through windows.

The fast-casual is an upscale twist on traditional quick service. In many fast-casual operations, the ingredients are prepared fresh daily, so there is greater reliance on refrigerated

rather than freezer space. Also, items are frequently prepared to order rather than being assembled ahead of time. Examples of this can be found in Mexican restaurants such as Moe's Southwest Grill and Chipotle, where each item is prepared individually to the customer's specifications. In these operations, the precooked or presliced ingredients are held in a steam table or refrigerated pans. The counter person draws portions for assembly, while the customers walk along the queue watching the items being made.

## BANQUET

Banquet-style service typically involves a predetermined menu that is usually prepared and plated en masse. Payment for the meal is arranged in advance. In some instances, the starter course may be preset on the tables. Banquet service is offered through the catering departments of full-service restaurants, noncommercial feeders, and hotels as well as in catering facilities.

Bulk food production equipment is typically found in a banquet kitchen. This type of kitchen can benefit from mechanized equipment used to pre-prepare foods. Walk-in refrigeration is important to hold raw foods and plated foods that are ready for service. Heated holding equipment is required for holding plated hot foods. In large banquet operations, heated carts are positioned around the banquet serving area before the course is served in order to speed service. Warewashing equipment dedicated solely to banquet operations is frequently incorporated into complex foodservice operations.

## FAMILY STYLE

Food is brought to the table on platters, which are placed directly on the table for self-service. This style is seen in full-service establishments. Chinese restaurants, in particular, favor family-style service. Designers find that extra tabletop space is needed to hold the multiple dishes involved. Family-style service is also seen in some hotels, where plates of food are placed in the center of a banquet table, allowing customers to rotate the lazy Susan to make their choices.

Heaping platters of nachos and wooden schooners bedecked with sushi are also examples of family-style serving vessels. The theater of these offerings can be a great merchandiser, but extra space on the tabletop is essential.

## BUFFET

Buffets depend on holding stations where diners or servers choose from the displayed items. In some cases, servers may assist in the portioning for control reasons. Buffets can be a straight line or scramble configuration. In the straight line, customers proceed in a logical flow from the beginning to the end of the line. In the scramble system, customers approach the buffet at random points. Hotel restaurants, especially for Sunday brunch, salad bars in full-service restaurants and noncommercial dining facilities, and sandwich stations in college cafeterias are some examples of where buffets are used.

Some buffets incorporate stations where foods are prepared to order or in small batches. This approach usually requires special cooking equipment—for example, butane gas burners, an alcohol-fired rechaud, or an induction cooktop.

## TAKEOUT

Takeout service relies on heat stable and leakproof disposable packaging. Food is either batch-prepared and then packaged, or prepared to order and packaged as it comes off the fire. Food may be packaged in a partially cooked or raw state for completion at home. That usually means cooking in a microwave oven, although an increasing number of disposables are intended for heating in a conventional oven.

Seating is not required for takeout, but sufficient space is needed for customers to wait for their food. Takeout service is an integral part of many quick-service restaurants—be it counter or drive-through—and represents most of the food sales in the convenience and grocery store market segment. In some places, reach-in refrigerators that hold bottled and canned drinks add to the check average, as do snack items, which are displayed for impulse purchasing near the POS.

Boston Market was an early and successful home meal replacement (HMR) operator. It offered customers comfort food like rotisserie chicken, turkey, and meatloaf accompanied by well-displayed side dishes and cornbread before the market term *fast-casual* was in vogue. Hot foods were typically batch-prepared and displayed in a steam table.

Some HMR operations offer packaged meals displayed in refrigerated cases (Figure 1.10). To maximize sales, HMR outlets may also offer desserts, beverages, and appetizers to



Figure 1.10

HMR depends on visual appeal to sell food. Here, the deli display cases help merchandise pre-prepared foods.

(Photo by Joseph Durocher)

accompany a main course. Over the past decade, much of the HMR market has been captured by grocery stores. HMR needs a high volume of traffic to be profitable. With an increase in dual-income families and longer working days for managers and executives, HMR warrants consideration in future restaurant designs.

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## DELIVERY

Delivery service relies heavily on telephone orders, with an increasing number of restaurateurs accepting delivery orders via the Internet. Prepared food is delivered to customers via bicycle in urban areas and motor vehicle in suburban areas. The success of delivery systems depends on population density sufficient to warrant the transportation costs. Delivery service systems are typically matched with takeout systems in a chairless storefront operation and combined with tray service in hospitals, hotels, and nursing homes. Sturdy, leakproof, insulated packaging is important to delivery operations, as is heat-retention equipment that works well with the chosen delivery vehicle.

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From a design perspective, the restaurant must have a comprehensive telephone ordering system that maintains customers' files. With the help of caller ID, a customer's past purchase records, address, and phone number are displayed when the order taker begins processing the order. The optimal system allows customers to charge their orders, thus eliminating the need for delivery persons to carry large amounts of cash. On the production side, menu items must be quick to prepare, and the cooking equipment must be capable of cooking foods rapidly and consistently, with little attention from the kitchen staff.

## CAFETERIA

Pure cafeteria service differs from buffet service in that customers select foods that are portioned by counter staff. In some cases, the foods are portioned and displayed for pickup; in others, such as with hot foods, the items are portioned by a server as requested. Diners assemble food and utensils on a tray. Cafeteria flow is generally cold items first, hot food items second, and beverages last. Whether the layout is a straight line or a scramble system, this type of service is the backbone of noncommercial foodservice and is often combined with a buffet-style salad bar.

Cafeterias work most effectively with a high volume of traffic. In the kitchen, volume production and holding equipment is necessary. Cafeteria operations frequently feature lower-priced food items in sauces, so equipment such as tilting fry kettles, steam-jacketed kettles, and deck ovens are often found in cafeteria kitchens. In the front of the house, the steam table and warming cabinets are essential design elements.

## TRAY SERVICE

Tray service involves the delivery of preordered, fully assembled meals. Temperature maintenance systems are often incorporated with the tray or delivery cart in order to keep hot foods at proper serving temperatures from the time of assembly to the time of service. In other cases, hot foods are rethermalized just prior to service. This style of service is employed in hospitals, hotels, nursing homes, and airliners.

Hospitals, nursing homes, and some flights are typically supported with tray service provided by a high-volume kitchen fitted with equipment capable of preparing foods in large batches. Tray assembly areas take up a great deal of space in such operations, and more floor space is needed to store carts and extra trayware. In hotels, tray-service food is prepared to order in the hotel restaurant or room service kitchen and delivered to each guest's room. In any tray-service operation, space is needed to hold carts in between meal periods, and easy access to elevators or delivery docks is essential.

## MACHINE SERVICE

Machine service refers to coin- or mag-stripe-operated vending, in which a limited assortment of preportioned or mechanically portioned food or beverages can be obtained

at any time. Staffing is required only to fill and clean the machines.

Equipment and product security are important design concerns for this type of operation. If a dining area is provided, it must incorporate low maintenance, highly durable tables and chairs, and dispensers for napkins, plasticware, and condiments. This type of service is a must in 24/7 operations such as health care and colleges and universities.

## SATELLITE SYSTEM

In a satellite system, foods are prepared in bulk at one kitchen (called a commissary), then transported to finishing kitchens and assembled for service at those sites. This style of service is most commonly found in schools and health care facilities, although such operations as Domino's Pizza prepare rounds of dough in a commissary, truck it to satellite stores, and turn it into pizza there. Dunkin Donuts has also gone to a commissary style of operation for their pastry and sandwich offerings. In addition, some full-service restaurants with many points of sale utilize satellite systems for some or all of their items because of the economies and control available through a commissary kitchen.

Volume production equipment is required in the production areas of a satellite operation. If foods are to be transported chilled, special tumble chillers or blast chillers are needed to quickly cool cooked foods. Walk-in refrigerated space is essential for holding foods ready for distribution. Transportation equipment, whether to in-house service points or distant points, must be considered as an integral part of the overall system design.

## THE KEY RESTAURANT BUILDING BLOCKS: SUBSYSTEMS

Each of the service systems just discussed is supported by numerous subsystems. One way to picture the process is to think of the service system as a wheel and the subsystems as its spokes (Figure 1.11). Every service system includes its own unique set of subsystems. The layout and design of each of these subsystems relates to the chosen system or systems

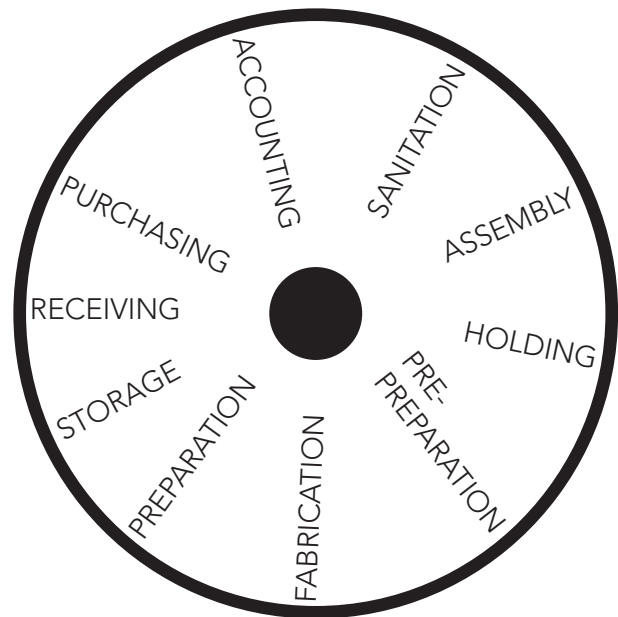


Figure 1.11

The subsystem wheel depicts each of the functional areas needed to support any type of service system.

found in the restaurant. To further define the restaurant concept, it is important to identify the needed subsystems before the project moves forward to the design phase.

## PURCHASING AND RECEIVING

The nature of purchasing and receiving food affects restaurant layout. Numerous factors must be considered before arriving at spatial allocations for receiving areas. Here are some questions to consider:

1. Will the food be purchased from many suppliers, all of which require time at a loading dock, or primarily through a one-stop-shopping distributor?

Delivery space can be minimized when the majority of products are purchased from a single vendor. With multiple vendors, a small loading dock can become a choke point during delivery time. For large operations, a raised loading dock—ideally, fitted with a height-adjustable loading ramp—can speed the delivery of large loads if they are delivered by vehicles with high tailgates. Investigate the type of delivery trucks used by local vendors for guidance



in designing the loading dock and access area. Deliveries made by 18-wheelers require far more maneuvering space than those made in a panel truck.

2. Will purchases arrive as individual cases or on a pallet?

In some large-volume operations, pallets move directly from the receiving dock to the production areas, with no intermediate stop in the storeroom. An adjustable loading ramp or lift is essential when foods arrive on pallets. In smaller restaurants, foods arriving in single cases typically are moved to a storage area accessible to the receiving area and kitchen.

3. Will food and supplies be purchased and stored in a company warehouse?

Many chain restaurants coordinate purchasing functions through a central purchasing office. If the “purchased” food and supplies come from a company warehouse, the space needed for the purchasing and receiving functions can be minimized. If the warehouse makes deliveries to units each day, the amount of required storage space can also be minimized.

4. Will purchases be made online or will distributor sales representatives (DSRs) visit the operation to take orders?

Online purchasing requires access to the Internet and a secured area for computer equipment. If DSRs drop by to take orders, the purchasing manager must have space in which to meet with them. The purchasing area should include space to maintain records on purchases and store samples of the tableware, flatware, and glassware used in the various service areas.

## STORAGE

In order to design successful storage subsystems, the designer must understand the frequency of deliveries and the issuing policy of the restaurant: location, size, and type of storage spaces as well as their access requirements flow from this information. If deliveries arrive daily, the storage

spaces can be significantly smaller than if deliveries arrive weekly. The volume of business also has a direct impact on the amount of space needed for storage.

Another consideration is the relative mix of dry goods, refrigerated foods, and frozen foods. Some types of operations use far more canned goods than others. Some may rely heavily on fresh foods, with little use of canned or frozen. All of these decisions have design implications. Here are additional questions to consider:

1. Will cooks work from open storage?

From a design perspective, it is essential that the open storage adjoin the production areas so that cooks need not waste time moving between spaces. Security is a major concern with open storerooms, so entrances to storage areas should not open onto the back loading dock or be located close to employee locker rooms if they are provided.

2. Will cooks have a par stock of some ingredients issued to their work areas, with special items drawn as needed from the storage areas?

This type of policy ensures that a par level of items like spices, salt, sugar, and other commonly used ingredients is maintained at the point of use in the kitchen. Expensive ingredients, or ingredients used for a particular preparation, are drawn from a controlled storage space.

3. Will a storeroom manager assemble the primary ingredients for the cooks?

This policy keeps the cooks out of the storage areas except when they pick up a cart loaded with ingredients for a particular meal. In such cases, the primary storage areas need not adjoin the preparation areas.

4. Does the potential exist for exterior walk-in refrigeration?

Walk-in refrigerators and freezers, when equipped with adequate locking equipment, are secure spaces that need not be located inside the restaurant building. When fitted with a weather cap, these exterior refrigerated spaces can help to minimize building costs. In some cases, a walk-in can be positioned so that its access door connects through an exterior wall of the restaurant.

5. Will deliveries arrive at times when the restaurant is not staffed?

If the answer is yes, a receiving space with an exterior and interior access door will allow deliveries to be made securely. This space needs to be planned at the same time as the receiving area. If an exterior walk-in is available, it can be fitted with an exterior door and a cage to allow for off-hour deliveries.

## FABRICATION

This subsystem includes those areas where food is first handled, or placed into process, prior to the pre-preparation stage. In classical kitchens, before the advent of preportioned meats, fish, and poultry, fabrication areas were commonly used to break down primal cuts of meat; in effect, the kitchen included a butcher shop.

Fabrication areas have become particularly important for large operations located in high-rise buildings. Follow the delivery of lettuce as an example:

Several cases of lettuce are delivered to a ground-floor loading dock. The lettuce is then moved to a ground-floor fabrication area, where the heads are unpacked, washed, and stored in large plastic containers for subsequent distribution to upper-level preparation areas. Without the fabrication subsystem, the cases of lettuce would be delivered upstairs for handling, then the empty cartons and wrapper leaves sent back to the ground floor for disposal. The fabrication area helps streamline the process and cut back on vertical transportation costs. Here are some questions to ask:

1. What items will be fabricated on site?

In many cases, fabrication is limited to protein items. Regional chains can create signature cuts used by all units by moving the fabrication function to a central commissary. However, filleting whole fish close to the time of service is still one of the best ways to ensure highest quality.

2. Will a separate fabrication area be needed, or will the function be performed in the same space used for pre-preparation?

If the spaces are to be shared, most of the fabrication will have to be done during third-shift hours when the preparation crew is not working.

Cutting strip loins and other wholesale cuts into steaks in a display fabrication area is an integral part of the merchandising process in some steakhouses. In other restaurants, a glass-walled refrigerated room allows diners to view the meat-grinding and burger-forming process; passersby can view thousands of pounds of rib roasts and strip loins in an aging refrigerator through a window that opens onto the street.

## PRE-PREPARATION

In the pre-preparation subsystem, foods are made ready for the final phase of preparation. For example, pre-preparation may include breaking the lettuce into salad-sized pieces and storing them in containers until ready for assembly on salad plates. Pre-preparation may be the *mise en place* work that is done for tableside flambé preparations. Pre-preparation may also include mixing, rolling out piecrusts, and assembling pot pies that are ready to go in the oven when ordered. A carefully planned pre-preparation area can speed final preparation in an à la carte kitchen and improve overall productivity in any kitchen. Before this space is designed, the answers to the following questions are needed:

1. Has enough space been allocated to prepare vegetables separately from protein foods?

Whenever possible, the sinks used to wash lettuce and vegetables should be separate from those used to defrost meat or scale fish, or in which the ice from a crate of chicken melts. The concern is cross-contamination. Salad and vegetable ingredients that are eaten raw can easily be contaminated and cause food poisoning if prepared on improperly sanitized surfaces previously used for meat, fish, or poultry.

2. Will pre-preparation be manual or mechanical?

Mechanized equipment can be cost-justified if it saves a sufficient amount of food and labor costs, or if it saves space. For example, a vertical cutter-mixer can produce hundreds of gallons of emulsified house salad dressings in one hour. The per-gallon cost for raw materials is far below that of brand-name dressings. Another example is a floor mixer that can quickly and evenly mix ingredients for meatloaf. A 30-pound batch of ingredients would take 10 to 15

minutes to mix by hand but only 60 seconds with a mixer. Additionally, the mixed ingredients can be put back under refrigeration or in the oven quickly, so there is less time for bacteria to develop than if they were prepared by hand.

3. Will pre-preparation for several kitchens or stations take place in a given area?

Centralizing the pre-preparation of numerous items can save time and space needs in the preparation areas. For example, the hot foods and bakery stations can both use the floor mixer mentioned above: hot foods with a paddle attachment for the meatloaf and the bakery would use the same machine to knead dough with a dough hook, or pie pastry with a pastry knife attachment.

## PREPARATION

The preparation subsystem (also called production) involves the final cooking or assembly of food (Figure 1.12). Every kitchen has a cold-food preparation area and a hot-food preparation area. Preparation may refer to the station where the pre-prepared salad ingredients are portioned onto the salad plates or the cooking stations where the marinated ribs are broiled or the scallops are pan-fried or where ingredients are cooked in a display kitchen.

This subsystem can also extend into the dining room. A display kitchen where chefs cook and assemble dishes for service is one example. Another is the Sunday brunch setup where the chef cooks individual orders of eggs or omelets



Figure 1.12

In the Mongolian Wok station in this University cafeteria, protein ingredients are added by the staff after students assemble veggies and other mixings.

(Photo by Joseph Durocher)

on gas or induction burners. Here are but a few of the questions that must be asked when planning preparation areas:

1. What's the menu?

Nothing affects the design of preparation areas more than the menu.

2. Will any of the preparation areas be in view of customers?

The answer to this question will influence the type of equipment that should be chosen, particularly the exterior finish of the equipment. Display kitchens must also incorporate hidden garbage containers and have surfaces that are easy to clean.

3. How many preparation areas will there be?

A simple foodservice system typically includes only a cold-food and a hot-food preparation area. However, in a more complex system, one might find a bake shop, banquet preparation, takeout preparation, and more.

## HOLDING

Once cooked, food items may be held awaiting service. Some foods need to be held hot, while others remain under refrigeration. Holding areas are often divided into two sections: holding for food prior to plating, and holding for plated dishes. Consider a banquet for which 400 boneless Guinea game hens are roasted. A holding cart is needed to hold the hens before they are plated. The holding cart is also used to hold the dauphine potatoes and medley of vegetables that will be plated with the hens. The sauce used as a bed under the hen must also be held. This holding cabinet is positioned at one end of the assembly line, while four carts capable of holding 100 covered plates each are positioned near the other end. In this example, the holding carts are perfectly suited to a banquet-style serving system.

Each service system requires its own custom holding configurations. These questions must be answered when planning for holding:

1. What styles of service will be employed?

As seen in the banquet scenario above, five large holding carts are needed to support a banquet for 400. For quick-service, à la carte, satellite, and other systems, different holding equipment is required.

2. What is the maximum number of meal components that need to be held at one point in time?

If the maximum number of banquet meals is 400, then five carts should be sufficient. In a quick-service burger operation, the holding areas must be sized to hold the maximum number of burgers and fries needed during peak service periods.

## ASSEMBLY

Once cooked, foods need to be plated or assembled for plating. In an à la carte operation, the assembly subsystem is adjacent to the preparation and holding areas. The lobsters come out of the steamer and go directly onto the plate and out to the customer (Figure 1.13). In a cafeteria or buffet operation, many foods are prepared and delivered in bulk to the assembly area located behind the serving line, then individually plated for the diner or set up for self-service.

Here, too, it is important to identify the style of service. Banquet service requires a large area for assembly. In à la carte service, the prime menu ingredient may come off a broiler and be combined with accompaniments that were batch-prepared and held in a steam table. In this case, each meal is plated individually, so the assembly area for à la carte service will be much smaller than in the banquet operation.

## SANITATION AND SAFETY

Warewashing, pot and pan washing, and interim and after-hours cleaning are part of the sanitation subsystem. Sanitation is frequently overlooked in restaurant design. Hand sinks, soap, and adequate hand drying must be easily accessible to all employees. Storage for mops, buckets, and cleaning supplies should be kept separate from food supply storage. A slop sink is essential, or floor mops will be cleaned out in the same sink used for washing greens. In addition, the decision to specify an expensive conveyor



Figure 1.13

The pickup area of the kitchen shown here, next to the assembly area, is where foods are often held under heat strips awaiting pickup by servers. The circulation in front of the pickup station affords staff the space to assemble all of the items needed to serve each course.

*(Photo by Joseph Durocher)*

dishwasher or a more moderately priced rack machine should be based on a careful analysis of the type of operation and the expected volume of tableware per cover.

Safety must be thought of in terms of food, employees, and physical structure. Food safety frequently intersects with sanitation. However, an increasing number of operators have upgraded security to ensure that foods are not deliberately tampered with prior to service. Employee safety addresses equipment issues and prophylactic measures that decrease the chances of physical injury. Physical structure safety includes fire detection, alarm, and suppression along with ventilation. Consider these questions:

1. How many preparation areas are planned?

At a minimum, one hand sink is needed for each work area. Don't forget that front-of-the-house staff also need a hand sink.

2. Will protein foods arrive as preportioned frozen or fresh?

Frozen items often need little or no handling before they are placed into preparation. However, fresh items frequently must be processed to get them ready for preparation. In such cases, equipment and supplies to sanitize an area are essential. Color-coded cutting boards help minimize the chance of cross-contamination when protein foods are fabricated or pre-prepared on site.

3. Will the cooking equipment be clustered in one area, or will foods be cooked in several locations throughout the restaurant?

If the cooking equipment is grouped together, then the ventilation and fire suppression configuration is quite straightforward. If several cooking areas are physically separated, the ductwork and fire suppression connections can look like a plate of spaghetti above the ceiling tiles.

## ACCOUNTING

Accounting subsystems—typically comprising order entry, printers, and cash and credit control devices—must be carefully integrated with the design of the operation. The components should be chosen based on the needs of the particular restaurant operation, that is, number of seats and menu items. Too often, sophisticated and expensive accounting subsystems are specified for small restaurants that actually need a less elaborate scheme. Sometimes this equipment becomes an unsightly and noisy intrusion on the dining experience. Here are a few accounting questions to consider:

1. Which kitchen/bar stations will get order printers?

Order printers ensure that production stations receive orders as quickly as possible. They also provide an important internal control service. Designers should ensure that cabling is run from the order-entry units to the remote printers.

2. How many order-entry stations will be needed?

This information suggests the number of front-of-the-house service stations to plan for. If servers work from a cash-and-carry system, a cash drawer will be needed for the head cashier only. However, if each server is assigned a cash drawer, the system cost increases and invariably results in fewer stations.

3. Will wireless systems be used upon opening or possibly in the future?

If wireless order-entry and credit processes will or may be used, it is a good idea to run wire for the wireless antennae before the walls are closed in.

The following three sections are subsystems for the front of the house but are included here as they relate to the back of the house.

## SERVICE

Service stations can be fixed or mobile. A generous number of stations that are complete service support units support the speediest and most attentive service. Stations that are a long distance from the kitchen need a more complete station than those that abut the kitchen, where backup is within a few steps. Most servers would agree that a service station that houses all of the tableware needed to reset tables for an entire shift is optimal. This requires a unit that holds the flatware, glassware, and napery for each station. Further, one that has a water supply and ice bin for filling water glasses and a hot plate for backup coffee helps service flow. Without these stations, servers have to travel back and forth from the kitchen to set and reset their tables. In addition, if a guest drops a utensil or is served a dirty utensil, the support station provides a quick replacement (Figure 1.14).

## CUSTOMER SUPPORT

This ranges from the napkin and sweetener station in a takeout coffee shop to a foot-operated hand-washing stations in a rib joint. In both cases, they offer an extra level of convenience for the customer. In a donut shop, the station should include waste receptacles. Providing disposable utensils and napkins on this station in a takeout sandwich or salad operation frees counter staff from having to include such items, and new prestacked dispensers improve sanitation (Figure 1.15). Operations that offer a bottomless cup of coffee can provide a complete coffee station where customers help themselves.

In quick-service operations, the trash bins where customers deposit their waste are important support stations, as are the conveyor belts in cafeterias where diners leave their trays. The design of support stations closely follows the type of service.



Figure 1.14

A fully stocked side station can help increase turnover and improves customer satisfaction and server efficiency. This service station at Hard Rock Cafe in Chicago incorporates a sink, backup reset supplies, and an espresso machine.

*(Photo by Joseph Durocher)*

Restaurants that will be targeted toward families must plan for a space to store readily accessible high chairs and booster seats. Diaper-changing stations are essential in men's, women's, and unisex restrooms. Trash cans, sanitizing wipes, and hand sanitizer dispensers at a changing station are welcome additions.

## SUPPORT STATIONS

In the kitchen, support stations may include all areas located near food pickup where the waitstaff obtain such items as serving trays and soup spoons. In some kitchens, preportioned salads are dressed by servers, who remove the salads from a reach-in that is filled by the kitchen staff from

the back and accessed by the service staff from the front. If these functions are overlooked in the design, servers will run around the kitchen trying to find a tray—while the plated foods get cold—and then serve a teaspoon with the soup.

## SUMMARY

The initial information-gathering process that must be done before the actual design phase begins is critical. A successful design begins in the planning process and integrates the front and back of the house. Careful consideration of restaurant type, the market, concept, menu, style of service,





Figure 1.15

These dispensers minimize contamination of food contact surfaces and save staff time.

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speed of service, per-customer check average, general ambience, management philosophy, and budget leads to the best design solutions.

Answers to the questions outlined here will provide the design team with important insights into critical

operational elements that must be incorporated with the final design. Without an understanding of these operational components, both kitchen and interior design can negatively affect the functioning of the restaurant.