Food and Beverage Systems

A Technology Primer
Developed by the
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OVERVIEW

There’s probably no more traditional expression of hospitality than in providing someone with a meal and refreshment. Making people feel welcome in a relaxing environment lets a host give full expression to the creative art of entertaining and putting people at ease.

However, since the F&B industry operates on very thin margins and must constantly stay ahead of trends to avoid being sidelined, it has never been more necessary to have effective automated tools to make it as efficient as possible. The challenge is to make the tools useful and comprehensive without letting them intrude on the guest’s experience.

Good tools focused on specific areas have been available for some time, such as Point Of Sale (POS), reservations and purchasing systems. Often, though, bottlenecks and inaccuracies arise when it comes to them exchanging data with each other. Recent technology advances are greatly helping the industry move forward, however. More open architecture, more flexible interface approaches and the widespread influence of the Internet and wireless communications all combine to provide more fully-integrated operations, with significant benefits to the bottom line.

As technology becomes less of a limiting factor, the challenge shifts to management to make the best use of these tools for a more effective operation.

Three Types of Operation

When it comes to their systems needs F&B operations can be roughly grouped into three types. The smaller restaurant operations, usually independents, typically look for almost commodity POS systems that are inexpensive and easy to learn and operate. These systems’ limited functionality can be a handicap if conditions change, but many of these operations work on a 2-3 year timeframe anyway. If the restaurant doesn’t work out, they’ll probably write it off and start again with fresh equipment. If it succeeds, there’s a better chance with a modern-technology system that they’ll be able to expand it, adding modules to provide greater control and more focused guest management. Either way, a straightforward, no-fuss system is all that’s needed to get operations off the ground.

Chains, corporations and higher-end operations with a longer-term outlook are much more focused on getting the most effective tools they can for the job, and on maximizing their use of technology and data to be as efficient as possible. For them, integration between POS, e-procurement, labor management, time and attendance (T&A) and accounting is critical. They’re looking for as complete a system as possible, preferably one that includes gift cards, customer relationship management (CRM) functionality, built-in Internet credit card settlement, etc., one that requires fewer third-party add-ons with their multiple interfaces and multiple vendors to manage.
Their systems must also be absolutely intuitive to learn and to use, due to the intense time pressures in any restaurant at peak dining hours and to high staff turnover. Increasingly often they must also be centralized, as this allows both a more standardized operation and more effective comparative reporting of operational results.

In between are the majority of hotel operations. Fully aware of the importance of guest relationship management, they have the extra challenge of offering many additional guest activities, and so need more extensive integration between guest-facing applications. Because of this breadth hotels haven’t historically needed to wring every last cent out of their F&B operations, and so have not focused so much on integrating their back-of-house operations into an effective, cost-conscious whole. But the opportunities are right there for them to do so.

Outline

This primer provides newcomers to the industry—from owners buying or renovating their first property to new hires—an overview of the main types of computer-based F&B systems available. These are conventionally divided into two groups:

Front-of-house operations, which covers everything directly involved in taking and delivering a guest’s order. This includes Point Of Sale, kitchen order management, dietary information, dining reservations/wait list management and table management.

Back-of-house (also called Back Office), including labor management and scheduling, inventory/purchasing, menu analysis and business intelligence/data analysis.

Please keep in mind that this is a general overview only. Many vendors’ products perform more functions and manage greater levels of detail than are described below, but all should at a minimum cover the operational areas listed. Other systems are available that cover more specialized functions than the general-purpose areas addressed here. Selection of any system or set of systems will be heavily dependent on each property’s particular market position, operational characteristics, and preferences.
FRONT-OF-HOUSE OPERATIONS
(Point Of Sale, table management, reservations/wait list management)

Point Of Sale (POS) Systems

The POS system is the core system for F&B operations, managing the ordering and delivery of all menu items in one or more restaurants and/or bars. As such, it must be capable of handling different menus and different pricing at different times of day.

Guests’ orders are entered by the wait staff into the system’s workstations, along with modifiers to specify side orders (salads, dressings, etc.) and preparation level (“medium”, “rare”, “no mayo” etc.). Workstations can be either desktop units placed in discreet locations in the main seating area, or smaller wireless hand-held units. The items requested are automatically routed to appropriate printers or video displays in the kitchen hot and cold preparation areas and service bar.

Figure 1: Typical order-entry screen. (Courtesy of MICROS Systems Inc.)
Several systems allow some items on an order, usually the main course, to be held back, and then sent (“fired”) to the kitchen at a later time to suit the pace of the guests’ meal. This can be done manually by the wait staff or automatically at a pre-set time typical for the operation and meal period, and reduces the chance of order tickets being lost while waiting for the right time to start preparation. Some chefs prefer to receive all tickets for an order at once, however, to help them plan ahead.

Guest checks are printed on demand. The charge for an individual item or for the complete check itself can be split between multiple guests, often by an intuitive drag-and-drop process on screen, and checks from different tables can be combined. Settlement may be made by cash, debit/credit card, gift card, to a guest’s hotel room or to a member’s account.

Items can be voided or discounted as required in the light of customer dissatisfaction. While it’s impractical to require management authority for every such action, it’s essential to require the server to enter a reason for each and for management to audit the detailed daily reports covering them.

Figure 2: Manager’s adjustment review screen. (Courtesy of Squirrel Systems Inc.)
Wireless handheld units, which transmit orders directly to the kitchen without the server having to walk back to a fixed terminal, are significant time-savers in dispersed environments such as swimming pools and beaches, especially if they are equipped with debit/credit card readers and signature capture functionality to handle payment. Aesthetically it can be a challenge to incorporate them into a fine-dining atmosphere, however, and in fact most are best suited to limited-menu operations since it can be time-consuming to drill down into all the menu options and modifiers of a table-service environment. However, some recent models use character recognition software to allow the server to go directly to a menu item instead of navigating a menu structure, which improves the speed of operation.

![Figure 3: Handheld order-entry screen.](Courtesy of MICROS Systems Inc.)

It goes without saying that all POS terminals must have eye-blink-quick response times, given the intense time pressures at peak periods and the need for servers to share workstations. User access must be equally fast, since to ensure security and accurate audit logs each user must sign in for each transaction and be signed out immediately they’ve finished entering their orders and settlements. This is most often achieved through each user swiping or inserting a magnetic stripe ID card, though some systems allow touch-screen entry of a 2 or 3 character ID code.
Kitchen video displays are steadily replacing the traditional order printers. Although initially more expensive than printers, their advantages include:

- much greater reliability, since they have no moving parts
- elimination of problems with order tickets being lost or made unreadable through spillage
- visibility to more people at once
- provision of visual reminders (color changes, flashing text) when an order is taking longer than expected
- ability to capture useful information on item preparation times and other aspects of kitchen efficiency, helping to refine menu choices and working procedures. For example, if an item is consistently taking too long to prepare the recipe may need changing, or the item could be dropped altogether. If one station is a consistent bottleneck, perhaps the work flow can be changed. Prep times can often be improved through careful and realistic analysis of the data.

Figure 4: Kitchen video display screen. (Courtesy of MICROS Systems Inc.)

Most POS systems can track the hours employees work through simple sign-on/sign-off routines; several also offer inventory/purchasing functions
and recipe analysis. However, specialized systems are more commonly used in both of these areas, and are discussed below.

Typical vendors include MICROS Systems, InfoGenesis, Squirrel Systems, Aloha, HSI, Digital Dining, PixelPoint, POSitouch and SIVA.

**New POS developments and trends**

POS systems themselves have become quite sophisticated over the years, and there hasn’t been a real demand lately for substantially different functionality. The main functional developments have been in making their screens and operation even more intuitive (such as with drag and drop check splits) and with improving their ability to integrate with other systems.

Six areas worth mentioning are:

(i) Signature capture is becoming more common, mostly in cashier-desk operations (where the guest can sign on a small counter-top unit) and in hand-held terminal environments. The hardware involved still has an image issue in fine dining restaurants, but an alternative in a hotel environment is to capture a guest’s signature at check-in and make it available on the POS workstations in the outlets for visual comparison and verification. Only a few systems offer this at the moment, but it’s not technically difficult.

![Signature capture on a handheld workstation. (Courtesy of MICROS Systems Inc.)](image)
(ii) The rapid and widespread growth of the Internet into the restaurant world has enabled many more operations to accept credit card settlements. Dial-up functionality was too slow for most quick-service operations and was impractical for wireless hand-held units, but now POS charges can be processed over the Internet quickly and inexpensively, letting more outlets accept cards. PCI compliance for card security is essential, of course. Secure wireless access also allows for the wider use of credit cards, gift cards or frequent-guest membership cards at portable workstations.

(iii) Ingredient analysis is becoming more generally available due to a wider awareness of ingredient-specific food allergies. Not to be over-emphasized on menus, it’s helpful to have available if the guest asks. Some generic software applications can help for more common recipes—the USDA has a basic database covering a few thousand ingredients, for example—but it’s not easy to map the specific ingredients and preparation methods used in one vendor’s recipe items to a different vendor’s nutritional data. Consequently many operators seek help from specialists in chemical or computerized recipe analysis. Alternatively, at least two vendors—CBORD and ChefTec—offer nutritional information for recipes prepared from their F&B inventory modules, as an integrated package.

Figure 6: Recipe Production and Nutritional Data. (Courtesy of Culinary Software Services, Inc.)

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(iv) Pre-ordering has become more common, especially in theaters and luxury suites at stadiums. Take-out and café-style operations can derive great benefit from allowing guests to order over the Internet, either from their own workstations or from Web-connected kiosks. Hotel room-service breakfast preparation and delivery can benefit from orders being entered the night before and fired to the kitchen at the appropriate times in the morning. As stadium suites become increasingly important, many operators take advantage of integrated systems to enter the F&B orders into their Inventory/Purchasing system days in advance, and download them to the POS on the day of the event. Variations and additions are then ordered through the POS workstations; the final check can either be settled in the POS system or transferred back to the I/P system for settlement.

(v) It’s becoming more common to run F&B and retail operations on the same POS software, especially for casinos and sports stadiums. This more accurately reflects the wider-ranging nature of guests’ transactions there, requires fewer different systems to buy and manage, and makes it easier to transfer staff and stock between outlets.
(vi) Management alerts. Several POS systems now include some form of management dashboard to keep a current view of key performance indicators. They can also set a variety of event triggers to send alerts to a manager’s pager, PDA or Blackberry when an indicator is reached or missed, advising of potential security or guest service issues. Examples include:

- a check that hasn’t been settled within 20 minutes,
- a table with three covers ringing up five rounds of drinks with no food order,
- a server who’s about to go onto overtime,
- the arrival of a guest celebrating a birthday or anniversary (as recorded in their profile in the reservations system), and so on.

The keys to these being truly effective are the ability to identify and configure realistic and meaningful alert conditions, and the willingness of managers to carry the devices and use them. The former is often much more readily achievable than the latter.

![Figure 7: Manager’s pager alert. (Courtesy of MICROS Systems Inc.)](image)

**Reservations and Table Management**

Dining reservations and table management systems have become much more common, helping operational efficiency and increasing the focus on guest relationship management. Since walk-in diners don’t provide their names and contact data when they arrive for a meal, any way to gather that information unobtrusively, such as through a reservations process, is bound to be valuable in encouraging repeat business.

Independent systems such as Guestbridge, OpenTable and Rock’s ProHost and RSViP do a good job of tracking guests’ bookings, history, preferences and important dates. Several POS vendors such as MICROS Systems, InfoGenesis and Squirrel Systems also now offer these functions as a module of their main system.
In both cases reservations systems offer ever more sophisticated functionality, including checking availability across multiple outlets within the same operation, making multi-table reservations for groups, and transferring reservations from one outlet to another. And if a Web-based system can also let guests book over the Internet, that benefits everyone, even if so far only a small percentage of guests take advantage of it.

Table management systems provide faster turns by showing the wait-staff and host highly-visible indications of meal progress data and wait time forecasts. They show a visual layout of the restaurant, allowing tables to be combined and split as needed through drag-and-drop actions. Different colors and tags show the status of each table, such as that guests have been seated, have placed their main order, have ordered dessert or coffee, and have received their check. Standard time intervals can be set for each phase, and alerts issued if these are significantly exceeded. The data captured allows detailed service analysis for more efficient table turns, or to help any service staff consistently taking longer than average to handle orders.

Figure 8: Table Management screen. (Courtesy of InfoGenesis)
Ideally, all these systems should be integrated, which is where the POS vendors’ products have a built-in advantage. Reservations systems should feed into a table management system that also handles walk-in wait lists. Some environments can also make good use of a wall-mounted wait-list display (complete with advertising messages), so that guests can see how long the wait is likely to be without interrupting the hostess. Most link to paging systems so that guests can be alerted when their table is ready, and some now offer table-top pagers that the guests can use to contact their server as needed.

If linked to the POS a check can be opened automatically as the guests are being seated, which is especially valuable in a buffet environment. Servers can also use these systems to review the guests’ past history, preferences or dietary restrictions before approaching the table. Bus staff can update the system from a workstation when a table is cleared and reset, and management can monitor the elapsed service times on each table. All of these factors make a noticeable contribution to operational efficiency.

**Gift cards and Loyalty Programs**

Gift cards are in widespread use these days, but mostly only as a cash-card payment method. Rather than storing the credit amount on the card itself, they’re usually combined with central records to make it easier to track their current remaining value and top them up with extra payments to keep the guest coming back.

One of the best-known current standard bearers for this is Starbucks. When the concept is cultivated as well as they do it, you build a loyalty program without having to give anything away, purely on the convenience factor and the innately rewarding “membership” sense of being recognized as a regular patron.

Loyalty programs can range from simple membership cards such as Starbucks’, with members receiving regular promotional mailings or e-mails, to more sophisticated promotion-oriented systems such as those from Fishbowl and MICROS’ mymicros.net. These can even extend to interactive-feedback approaches which let guests enter a reference number printed on their check into a workstation (or, later, on a Website accessed through their own PC at home) to provide immediate feedback on their experience and receive further discounts or other rewards.
HARDWARE

POS Workstations

These fall into two categories: purpose-built specialized units (from either POS vendors such as MICROS and Squirrel, or general-purpose hardware vendors such as IBM, Sharp and NCR), and off the shelf PCs. The former take up less space, are ruggedized for restaurant use to withstand spillage and hot and humid environments, but often cost more. PC-based units can either be standard PCs with touch-screen displays, or thin-client devices that act like a PC but have no hard drive (i.e. no moving parts). These tend to be more reliable and a little cheaper, and are nowadays equipped with enough memory that they can continue to operate in stand-alone mode if the connection is lost. They also have the advantage that if a unit fails it can be quickly replaced with a spare that, on signing in to the server, immediately adopts the prior unit’s settings, quickly restoring the operation.

Figure 9: Standard IBM SurePOS workstation. (Courtesy of InfoGenesis)
Peripherals that are often configured with a POS workstation include cash drawers, pole-mounted displays for guest visibility, check printers and magnetic-stripe card readers for settlement.

Hand-held terminals

Hand-held terminals have become both smaller and more practical, benefits of the astonishing growth in wireless network capability and in the functionality available in general-purpose PDAs. Screen design is very important; the more portable devices, often based on consumer PDAs, are convenient to carry but not always to use, given their small screen size. Character recognition, introduced quite recently, has helped navigation and ordering by allowing the server to jump straight to a menu item by writing the first few letters of its name, avoiding having to click through an excessive number of menu pages to drill down to it. To make them less obtrusive in restaurant environments, some operations incorporate them into leather or vinyl folders to make them resemble the more traditional pads.
Also useful are the slightly larger all-in-one units, incorporating signature capture, credit card swipes and a small printer. These are much more practical now that secure wireless networks are so pervasive, and allow the server to complete the full transaction in front of the customer. A fine-dining ambience is even harder to maintain with the bulk added by a card swipe and printer, though there are definite advantages to the guest’s reassurance in not losing sight of her credit card. These all-in-one units may become less bulky with the introduction of RFID-based credit and debit cards, which can be charged by a proximity reader instead of needing a physical swipe, but they’re never going to be really unobtrusive if they’re to remain usable.

In general, handheld terminals are still best suited for very specific environments, such as stadiums, poolside or beach areas, where a runner can deliver the order to the guest without the server having to return to a fixed base workstation. A relatively limited menu definitely helps, speeding up the process by limiting the number of options the server has to deal with on a small and hard to read device.

In the past most handheld terminals were provided by the POS vendors themselves, but many vendors now offer generic units that work with a variety of POS systems. Examples are available from ActionSystems, Pocketcheff, ReachPOS and others; as always, it’s important to review these carefully for usability and applicability to your own operation when looking to buy.
Tablets and E-Menus

Tablet PCs are more usable than hand-held units due to their larger screens, but they’re still too bulky and heavy for widespread use except back-of-house in warehouses and receiving docks.

However, an interesting restaurant application is being tried out in the form of e-menus, especially for wine lists, where the unit (often in a tasteful leather folder) can be left with the guest for perusal before ordering. The amount of additional information available to the guest, such as nutritional data or wine tasting notes and possible food/wine pairings, is a particular advantage.

The cost is still a downside, as is the risk of slowing down the order-taking process as the guests review all the considerable information available to them. As always, the user interface design makes a big difference in finding the right balance of initial information to help first decisions, with further detail available if needed.

Kiosks

As in so many areas of modern life, kiosks are becoming a more common sight in F&B operations. They’re not suitable for every outlet or every guest, but many customers will be very happy to use them if available. Quick-Service Restaurants, coffee shops and cafes especially find them useful to speed up order placement and increase accuracy. They do present an opportunity to provide more information (e.g. nutritional values, ingredient lists or special offers) and to try to upsell the guest, but this shouldn’t become intrusive or slow down the order-entry process, which is the main reason the units are there in the first place.
MAIN POS FUNCTIONS

Order Entry

• create menu items that can be sold at different prices at different times in different outlets (restaurant, cafeteria, bar, room service, etc.).

• create modifiers (salad dressing preference, meat preparation preference, etc.) that can or must be applied to individual menu items.

• allow menu items to be grouped together into combinations with a single price.

• define a default kitchen/bar printer or video screen where orders for each individual menu item will be routed, plus a secondary location in case the first is unavailable.

• allow some ordered items to be held back for transmission to the kitchen at a later time, either automatically after a pre-determined interval or manually when the server judges that the timing is right.

• maintain and display to all servers a current total of significant menu items in short supply, such as daily specials, counting down the number still available as they are ordered.

• facilitate the running of promotional campaigns and server competitions.

• provide for the simple, rapid entry of quick-service items such as coffee or bar drinks.

• provide a simple way of re-ordering a round of drinks.

• allow for the ordering of off-menu items, with preparation instructions.

Settlement

• allow for the straightforward splitting of charges on a check among the guests at a table, including dividing the cost of individual items or the whole check between two or more guests, in varying proportions.

• allow checks to be transferred from one server to another.

• combine checks for different tables and/or servers.

• automatically add a pre-set gratuity percentage and/or service fee for parties exceeding a certain size or for deliveries such as room service.

• provide full reporting of tips.
• record the settlement of checks to cash, check, debit or credit card, to a hotel guest’s room folio or to a club member’s account.
• track all check item voids, corrections, and adjustments.
• provide a full set of operating reports, including cashiers’ shift balances, menu item popularity/profitability, server productivity, and so on.
POS INTERFACES

POS systems, especially those with reasonably full-featured time-keeping and inventory/purchasing functions, are quite often operated in a stand-alone environment. However, they can often be made more effective when integrated with other systems. The more common interfaces are as follows.

Hotel Property Management System (PMS)

- Sends requests to the PMS to display the names of all guests registered in a specific guestroom,
- Displays the returned list along with any credit restrictions,
- Allows selection of the correct guest, and (guest credit limit permitting) sends the POS charge for posting against the guest’s folio.
- Sends some degree of POS check detail to the PMS along with the total charge, to reduce the number of POS charge disputes at check-out. Early systems sent only four sub-totals—food, beverage, tax, and tip—but now sixteen are more common.
- At end-of-day, send totals of all room charges to the PMS to help balancing of all folio charges.

A few high-level PMS/POS interfaces have been developed between specific pairs of systems, which allow the PMS to:

- retrieve all line item details of the POS check from the single total on the guest’s PMS folio;
- recognize when a POS check has been opened for a particular guest in an F&B outlet and set a corresponding location flag on the PBX operator’s guest list;
- alert the POS cashier that the guest settling his or her check has a message entered in the PMS; and even
- let the guest check out of the PMS from a POS terminal, for example, after breakfast.

Some interfaces also pass revenue sub-totals for all POS settlement types (not just room charges) to the PMS at end of day, which can make it easier to prepare the nightly operational “flash” report for the complete operation.

Reservations/Wait List Management Systems

- Automatically opens a POS check when a waiting guest is seated.
- Can also start the service timing clock for that table for a table management system.

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• Feeds back POS check details to the guest’s profile in the reservations system.

**Inventory/Purchasing (I/P) Systems**

• Sends details of menu items sold to the IP system, which breaks down the items into their standard ingredient quantities and decrements the theoretical inventory levels on hand. This is not often used in a hotel environment, due to the considerable labor involved in establishing and maintaining menu recipes.

• Sometimes also receives current ingredient costs from the purchasing system to check (and, rarely, update) the POS menu prices.
BACK OF HOUSE OPERATIONS (inventory/purchasing, menu analysis, business intelligence/data analysis and labor management/scheduling)

Overview

You can’t manage something properly unless you can measure it. These systems all provide significant amounts of data to allow for more accurate food costing and the real-time monitoring of key performance indicators. Inventory/purchasing (I/P) systems in particular are very valuable tools for managing all aspects of stock control and ordering and can quickly show a good ROI.

Cost control is critical, even in high-end properties that typically set prices according to market tolerance rather than by ingredient cost. The food cost percentage may be within limits, but why not explore the possibility that it could still be improved? Is it OK only because your prices are high? Tighter control can lead to lower costs and more competitive pricing, raising profits through better margins and increased business at the same time. Equally important, embedding your operating procedures in the systems instead of just in the minds of the managers will minimize disruptions if they leave the company.

The main functions of I/P systems are pretty straightforward. Inventory systems maintain a perpetual count of all items in all storerooms, automatically reduced as items are requisitioned and issued for use, and automatically increased as shipments are received and recorded against purchase orders. Requisitions can be created manually as required, as well as being drafted automatically when on-hand stock falls below par level.

Purchasing systems aggregate requisitions from various departments for supplies from different vendors and consolidate them into purchase orders for review and action as needed. They also draft purchase orders automatically when individual item stock inventory falls below pre-determined re-order levels.

Menu analysis modules allow the ingredients listed in the inventory system to be combined into various recipes, usually nested so that kitchen production items such as soup stock can themselves be ingredients in a more complex recipe. This allows for quite accurate menu item costing; the systems are detailed and flexible enough to account for frequent changes in pack sizes and prices by the vendors.

Many F&B vendors (especially Sysco and US Foods) offer properties access to their own centralized ordering systems. While this has convenience advantages where a single-vendor purchasing policy is in use, more complex operations will find it too restrictive.
**Purchasing**

Purchasing in many hotels is still often managed differently for F&B and “general” items, the latter covering retail outlet items, FF&E and all other hotel supplies. This is changing to some extent, especially in casinos where outlets offer both retail and F&B products, and many larger operations with enterprise accounting suites try to use these applications’ general purchasing modules to cover both areas.

However, F&B ordering does have special requirements. Restaurants buy an amazing mix of perishable and other products on a daily basis from multiple national and local vendors, with considerable variation in local and regional item specifications reflecting guest preferences and product availability. Apart from menu changes, individual item container and pack sizes in particular often change frequently.

Although good integration with accounting, especially accounts payable, is still essential, managing all these factors effectively requires a specialized application. In addition to the purchasing modules offered by POS vendors, modern systems are also available from independent vendors such as Eatec, Adaco, Culinary Software Services, CBORD, Moreton Bay, Agilysys, RHR Systems and RedRock. All combine detailed and complex functionality with great flexibility and significantly improved ease of use compared to older systems.

A major trend in recent years has been the widespread adoption of electronic documents—bids, invoices and requisitions—to allow a much more efficient quotation process and tighter cost controls. Direct imports of electronic bids allow current pricing from multiple vendors to be kept online at all times. This can be done either automatically through two-way XML links between the restaurant and vendor systems, or by the vendors using FTP to post bid files manually out to Internet folders from which the outlet’s I/P system can retrieve them when required.

Smaller suppliers can enter their prices into standard Excel spreadsheets and e-mail them to the outlet, where the purchasing system can import them automatically. This isn’t as flexible, of course, since changes to the item list or to pack sizes need to be updated both in the spreadsheet and in the import macro. Nevertheless, it’s a huge improvement over the tedious, error-prone practice of manually re-keying printed quotes.

Not surprisingly, single-source contracts are losing favor since it’s so much easier to keep several vendors’ bids current in the system. If you’re buying some items on a strict lowest-cost basis, for example, an I/P system can automatically draft multiple purchase orders, picking the right vendor for each item. Even if single-source is preferred for a national contract or other reasons, easy access to multiple vendors’ figures helps verify that the supplier’s prices are in line.
Efficiency is also being helped by a move toward more precise ordering, driven both by data analysis within the I/P systems themselves and by their integration with other hotel and catering systems. For example, instead of setting a single par stock level for each item and triggering a re-order when inventory falls below that figure, par levels can vary according to known business volume fluctuations by the day of week or season, or even according to the forecast guestroom occupancy or catering function traffic. Greater precision means fewer lost orders through being out of stock, and less spoilage from being overstocked.

Receiving

The receiving process is a challenging area to automate, but modern I/P systems help manage it well. Goods are usually received against the electronic order so that only exceptions need to be entered. Items that are over-delivered, substituted with a different pack size or an alternative product, or delivered without an invoice can all be recorded accurately for later verification. Miscellaneous charges (shipping, handling and taxes) can be allocated to some or all items, or posted to separate general ledger accounts.

Since not every item has a bar code label, I/P systems can print them to attach as goods arrive on the loading dock, both to speed data entry there and for use in other areas. While primarily used to generate sales tags for Retail items, this is also useful for F&B items. High-ticket items such as sides of meat, for example, can have bar code labels hung next to them in the cooler to speed physical counts.

Bar codes can greatly speed reordering if the chef, for example, does his daily rounds with a hand-held PDA that has a built-in scanner. The codes for required items can be scanned and quantities added quickly, the total order being uploaded to the I/P system when the PDA is docked back in the chef’s office. If the hotel has a strong Wi-Fi network throughout the property, of course, the process can be even quicker, but signal strength in the cooler is often marginal. If wireless networking is desired in the kitchen and storeroom areas, a thorough site audit should be done beforehand to ensure complete signal coverage of all appropriate areas.

RFID tags have been receiving a great deal of publicity, and some systems can generate them as easily as bar code labels. Currently, though, RFID doesn’t offer much advantage to F&B operations. Apart from the still-high cost of tags and scanner gateways to read them, there are challenges with reading individual item tags on, for example, metal cans containing fluids. Pallet-tagging may be their first usage, to make it easier to check which items from multiple orders have been shrink-wrapped onto a single pallet. For now it’s a technology with much future promise, but not one to focus on in the short term.
Requisitioning

Completing a requisition for items from a storeroom is now almost always done on-line with electronic forms. Draft requisitions are generated automatically when on-hand stock falls below par levels. They can of course also be prepared manually, such as for a chef’s daily order sheet.

Paperless transmission has really sped up the approval process, and approval itself is often given faster since supporting documents (e.g., copies of the vendor bids, or photos of the items being ordered) can easily be attached. Consolidation of items from multiple approved requisitions into the various vendor orders is also simpler, and shipping instructions can specify which items are to be delivered bundled together for delivery to a single location.

Physical Inventory Counts

All systems can print traditional inventory count sheets for the storekeepers to mark with the on-hand quantity of each item in its various pack sizes. However, the process is slow and tedious, as well as prone to transcription errors when the counts are entered into the I/P system later. As a result, hand-held bar code scanners are increasingly used, bringing improvements in speed and accuracy through precise product identification and automatic data upload into the I/P system. Items without bar codes on their own packaging can have adhesive or hanging labels printed for them by the I/P system during the receiving process.

Monthly physical inventory counts are becoming less common, at least in the United States, and more properties now use cycle counts. A typical breakdown would be china/glass/silver/etc. annually, linen semi-annually, food quarterly and beverage monthly. High-cost items, however, are still tracked on a monthly basis, along with spot checks of other key items.

On the software side there has been some movement towards tracking the expected shelf life of fresh produce items, to ensure that stock is rotated or disposed of before it deteriorates. It’s obviously important to monitor usage carefully to set proper on-hand quantities; too little and you lose sales, too much and it spoils. Chefs have always had to do this, of course; what’s different now is the inclusion of item shelf life in an inventory system for a more structured recording and analysis approach.

Menu analysis

Many systems include a menu analysis module that will adjust the cost of prepared recipe items based on the latest (or averaged) cost of ingredients. This is definitely worthwhile, but requires careful thought during system implementation to make sure that you don’t try to micro-manage every possible detail. Recipe pricing and menu analysis are tempting areas for
refining cost controls, but if overdone can quickly bog down the users in a never-ending round of data entry and maintenance.

This applies especially where a chef has significant flexibility in menu choices, although frequent changes in product pack sizes also make keeping up with recipe changes burdensome. The preparation instructions for a recipe may include more detail than is practical to cost (one pinch of salt, one pinch of pepper: these are consumables, whose cost can be allocated as a small add-on to all recipes) and managers must keep an eye on what’s really worth tracking. Overall cost percentages are clearly the key figures to watch, but nevertheless the main recipe items in typical menus should be costed on a periodic basis to keep an eye on whether their pricing is still appropriate.

Banquet costing is simpler since there are more fixed menus. Giving the sales managers access to the menu costs can be a great help when a client is negotiating prices, since they’ll know how low they can go and still return a profit. The banquet checks will need to be run through the POS to track sales against production, which may require a change in current procedures.

Integration with POS systems offers additional benefits, such as downloading daily sales figures for POS menu items to compare with reductions in the inventory stock levels of their ingredients. Historically this link has not been common due to the effort required to set up and maintain the recipe data, but it is becoming more popular as it makes performance analysis much quicker.

Retail POS systems, in contrast, are very tightly integrated with I/P systems, both for stock control and due to the higher count of different items sold. Retail POS workstations are frequently populated with new items received for sale in the I/P system, which generally does not happen with F&B systems. However, with a growing number of outlets offering retail items, clothing and other souvenir merchandise, there’s a movement towards combining retail and F&B items on the same system. This is especially so in stadiums, but it’s handy in resorts, too, so that logo-wear and spa product sales can be as tightly integrated with a guest’s folio as F&B and room charges. As a result, F&B modules are being integrated with I/P more often.

Because recipe entry is often seen as requiring a daunting data effort despite the extra returns it brings, some vendors include entry of a given number of recipes as part of the system implementation. It is certainly worth doing periodically for common and high-priced dishes as a spot check on prices, especially on brunches and buffets. Casinos in particular see recipe pricing as a vital part of their cost control.

Central Purchasing

Central purchasing arrangements are still a mixed bag. Multi-property operations clearly benefit from leveraging their purchasing volume to
maximize discounts; the difficulty lies in defining common item standards for geographically diverse properties.

This isn’t so much of a problem for general items but local F&B variations are common, making it difficult to accumulate significant volumes. Even if a chain has standard mixed-drink recipes, for example, the actual brand available for a particular ingredient can easily vary from region to region. Consequently many chains’ centralized systems tend to focus principally on non-F&B items, as do the hotel-sponsored purchasing companies such as Avendra and Birch Street.

Nevertheless, even without wide commonality of individual items central systems can make a major contribution to operating efficiency by consolidating the spend in various categories for the chain as a whole.

They also help track and therefore manage the various outlets’ compliance with national contracts, a major concern for chains. One property taking a good deal from a local vendor may jeopardize significant discounts if it results in the chain falling short of its quantity commitments to the national provider. It’s not unknown for outlets in a small regional cluster not to be allowed to place orders at all, and be restricted to sending requisitions to a corporate purchasing office for action.

As consolidation continues in the industry both between hotel operators and between vendors, procurement standards for regional operations—or even corporation-wide—will become more common, driven by the demand for greater control and efficiency. The use of centralized purchasing operations is thus likely to gain momentum.

**Reporting and Business Intelligence**

Back- and front-of-the-house systems may interface by transferring data to and from the central server. Profit (or loss) statements, budgets and variances, daily reports, and balance sheets are prepared with the aid of software programs. The advantage of this technology is that information is provided in real time, enabling operators to make informed decisions quickly. Quicker decisions allow managers to “keep their fingers on the pulse” of the restaurant. When the back- and front-of-house systems are interfaced, it is easier for management to monitor service times, POS food costs, labor costs, and guest counts. Again, this compilation of information helps managers make more informed decisions.
Both POS and I/P systems have extensive report options and can produce good management insights into potential problems. POS sales data provides item popularity reports; combining these with I/P costs produces item profitability as well. Analyzing sales volume by 15-minute periods is a huge help in scheduling staff efficiently.

Figure 12: Sales Breakdown Analysis screen. (Courtesy of Squirrel Systems, Inc.)
On the cost side, checking for inaccurate inventory extensions can catch bad data entries quickly. Sorting the inventory list in both ascending and descending order allows for a quick reality check on the most and least expensive items. There shouldn’t be any flour, sugar or rice valued at thousands of dollars; T-bone steaks shouldn’t be priced for pennies.

POS sales totals can be tracked against inventory usage and waste/void write-offs in the I/P system. If beef tenderloin, for example, is being “used” faster than it’s being sold, customer returns and possible menu specials

Figure 13: Multi-outlet comparisons. (Courtesy of Eatec Corp.)
should be checked in the POS system data against the spoilage/waste reports from the I/P system to narrow down the actual variance. Excessive waste and customer returns must be documented and the problems resolved quickly, and having access to system data gives you a much better chance of managing this.

Several POS and I/P vendors also offer separate business intelligence (BI) data analysis modules. These can pull data from multiple F&B systems into high-level reports to simplify the analysis, yet allow drill down into the underlying detail to investigate exceptions. These can provide excellent insights into the operation and are invaluable for multi-site operations in analyzing sales, usage, the profitability of each outlet, the accuracy of par levels vs. re-ordering cycles, delivery times, seasonal/day-of-week variations and much more.

Independent BI vendors’ systems such as Avero’s Slingshot, Compeat, CrunchTime!, erestaurantservices.com, Posera’s Maitre’d and ProfitSword also offer the ability to pull data from multiple different vendors’ systems.

As with all BI systems, though, it’s important to ask them the right questions. They can all help you become better informed; the key to maximizing their worth is to act on that information to identify and correct poor business processes.

**Labor management**

Labor scheduling continues to be a major challenge. More detailed data on how an outlet’s business varies over a day, week, month and year is really the only way to get better handle on forecasting, but flexible and intuitive scheduling management tools do help. Better integration with hotel and catering management systems can also help forecast the volume of group and transient guests likely to show up in the restaurants, and at what times.

Time management at the outlet level varies all the way from simple clock-in/clock-out time stamps on a POS terminal to sophisticated time and attendance systems such as Time Management’s TMx or Commeg’s TimePro. Many systems prevent staff from clocking in more than ten minutes earlier or five minutes later than their scheduled shift times without a manager’s override, to prevent socializing on company time.

Since labor costs are such a major part of the budget, each week’s schedule should be prepared individually and not just copied from the previous week. Actual figures for the prior period should be checked against the forecast to identify factors that would improve accuracy, and both should be compared to the theoretical baseline. Next week’s forecast and any special events that impact business are then considered, and the schedule adjusted to suit.
This is an area often incorporated into a multi-outlet chain’s central data collection and analysis system, to maximize the use of skilled labor forecasters and planners at the corporate offices in creating efficient labor schedules and to monitor actual hours.

Labor management systems also monitor position applications (which can now be online and paperless), recruitment, personnel information, I-9 status, tax status, availability, vacation, and benefit information. Actual time worked is recorded, data on tips entered and later reported per IRS guidelines, and paychecks calculated.

![Employee Setup](image)

**Figure 14: Employee set-up screen. (Courtesy of Squirrel Systems, Inc.)**

Many POS systems now include computer-based training courses, either on their workstations or available via the Internet. This is especially important to multi-unit chain operations to ensure brand and service consistency, but can provide useful introduction and refresher training for independent outlets, too. General industry training programs such as those from the National Restaurant Association Educational Foundation are also highly recommended.
Automation can also help with getting the right staff in the first place; the restaurant industry paradox of dealing with high employee turnover while striving for a quality guest experience isn’t going to be solved any time soon. Using a good applicant tracking and hiring management system such as those from Unicru and Taleo can help speed up the process and keep a useful database of candidates available to fill the inevitable future slots.

Centrally-Hosted Systems

Centralized systems for multi-unit operations are quite common in the F&B world, principally to collect sales and operations data from multiple outlets and, in the case of multi-unit branded chains, to feed down menu and pricing changes and promotions to the individual outlet POS systems.

They’re typically more of a hybrid than the pure remote-server-plus-dumb-terminal ASP configuration, and usually have some form of local server at each site communicating with a central corporate server. POS terminals perform highly time-critical functions, and it’s not acceptable for them to be down due to a network problem with a remote server. Consequently, even in a single-outlet situation many workstations can run in stand-alone mode even if their local server is unavailable, re-synchronizing data when the connection is re-established.

These systems can also provide central monitoring of the security or service alerts sent to the outlet manager’s pager or PDA. The local manager must be aware of such problems to resolve them immediately, of course, but central consolidation and monitoring of all such data from multiple outlets can quickly highlight general training and security issues.

ROI of Inventory/Purchasing Systems

The value of reducing errors in the purchasing process is significant; the National Restaurant Association estimates that 1 percent of all invoices are incorrect, and in any high-volume operation this can amount to a significant financial shortfall.

Electronic documents help by making it much easier to do a triple check, comparing items ordered with those received and those invoiced. Not surprisingly the latter two almost always agree, but over-delivery and vendor substitutions can be expensive. Highlighting differences from the order is the first step to effective cost control.

Other factors contributing to I/P systems’ ROI include:

- holding people accountable, by checking that major items ordered (e.g., 10 cases of T-bone steaks) were all tied to sales recorded in the POS system or to specifically-approved spoilage write-offs, and don’t just disappear
- lowest-price bids being kept in the system at all times, automatically
• more-precise ordering through managed par levels
• better communications with the primary vendors, to alert them to future demand peaks and to identify substitutions as soon as an order’s shipped and plan around them

The payoff for companies with high rates of “perfect orders” — those that are complete, in the right place, undamaged and on time — can be substantial. A recent AMR Research survey found that a 3 percent improvement in perfect order fulfillment translated to a 1 percent increase in profits. Companies that ranked high carried less inventory, had shorter cash-to-cash cycle times and were more profitable overall.
MAIN FUNCTIONS COVERED

Inventory

- create records for all stock items, including vendor(s), most recent costs, bids for future shipments, storeroom location(s), units of measure and conversion ratios (shipping, storeroom, issuing, and recipe units are often different), and re-order stock levels.
- create recipe items based on various combinations of stock items and other recipes.
- maintain item and recipe costs based on LIFO, FIFO, and average-cost calculations.
- create requisitions to transfer items from the storeroom(s) to the kitchen(s) or end-user departments, holding for consolidation and manager’s approval as appropriate, and record the issue of items against these requisitions.
- produce count sheets to aid in periodic physical inventory checks, which preferably are aided by bar-code scanners recording the actual shelf counts.

Purchasing

- maintain vendor master records either in stand-alone mode or in conjunction with an accounts payable system.
- create draft purchase orders based on direct user input and on automatic generation from stock item quantities falling below re-order levels.
- consolidate purchase orders from different departments for items from different vendors, and issue to vendors, if necessary, after manager-level approval.
- receive full and partial shipments against purchase orders, preferably using bar-code scanners to record deliveries, and taking into account price, quantity, and prompt-payment discounts.
- assign received items to storerooms or direct-issue them to departments, as appropriate.
- pass invoice details to accounts payable for action.
INTERFACES

I/P systems commonly use the following two interfaces.

**Point of Sale Systems**

- Receives details of menu items sold in the POS system to adjust theoretical stock levels of the various ingredient items sold.
- Sometimes also sends current ingredient costs to allow for checks against the POS menu prices.

**Accounting Systems**

- Requests and receives vendor information as purchase orders and invoices are handled.
- Sends individual and batch invoice data for posting.
INTERFACES BETWEEN THESE SYSTEMS AND WITH OTHER HOSPITALITY SYSTEMS.

As in so many areas of hospitality technology, improving one system can make a measurable difference, but integrating several together raises efficiency to a much higher level by giving each a more complete and accurate picture of the whole. Fortunately, this has been made much easier with the current move to more open architectures and XML-based interfacing. Modern systems that have embraced this approach have more flexibility in which systems they interact with, and to what degree of depth and detail.

For example, the Squirrel One POS allows both the vendor and its distributors to modify the system quickly and easily by writing Java extensions to meet specific customer needs, with the result appearing to be part of the main application. Squirrel wrote one to emulate Time Management’s TMx time clocks, so that the TMx software believes its own time clock is providing input whereas it’s actually a software simulation on the Squirrel workstation screen. Squirrel’s distributor in the Pacific Northwest, Pacific Coast Systems, wrote an extension to handle pool-table management for a specific client, and incorporated it into the base software.

Another example is supply-chain vendor Eatec’s multi-protocol Exchange module. This gives Eatec’s inventory/purchasing system the flexibility to integrate with a variety of POS, supply-chain management and financial systems through its ability to handle multiple industry standard protocols from EDI to XML/SOAP, covering data imports as well as exports.

Integration with property management and other guest-focused systems is better thanks both to client demands and to better interface technology, but can become still more seamless. Many PMSs can already look up the POS check detail for charges originating in an F&B outlet or spa, but it’s still not as common as it could be to have dining reservations show up on the guest’s complete stay itinerary in the PMS.

Better integration with a PMS and/or Spa system could lift service, too; if a guest at the poolside orders another drink, it would be nice if the POS could remind the server that the guest has a spa appointment in 40 minutes. And while there’s a danger of being seen as too intrusive, there are advantages to the server also being made aware if the spa treatment in question cannot be given within two hours of the guest consuming alcohol. That level of interface sophistication is rare at present, but with modern systems there’s little technical impediment to it.
WIRING/INFRASTRUCTURE AND IMPLEMENTATION ISSUES.

Implementing a POS system requires careful planning in the placement of the workstations, printers, video monitors and cabling. Work flows must be thoroughly reviewed to make sure that the right number of workstations are in the right places, and that kitchen video monitors (for example) can be viewed easily from the appropriate workstations. Some systems connect check or order printers to a cable from the nearest workstation; others drive them from the central server, requiring a very different cable run.

Space is always at a premium in any F&B outlet, and it can be hard to find appropriate room for workstations. Fortunately, many modern units are all-in-one self-contained devices, but some systems do use PC-based workstations, either full PCs or thin-client units with more compact processing units.

Either way, it is essential for system reliability and maintainability that workstations and their processing units are incorporated into hostess kiosks, bar counters, server stations, etc. in such a way that they have adequate ventilation, that their cable connections are protected and that other items cannot be stacked on top of them. Cables must also be run tidily and protected appropriately from what can often be a hazardous environment for electronics.

Every vendor has horror stories of PC workstation CPUs being stuffed sideways into cabinets under bar sinks, of damp dish cloths being stored in a heap on top of an uninterruptible power supply, of cables being draped across (or through) the ice tray under a bar, and so on, all with the expected devastating impact on reliability.

Systems are absolutely critical to the operation of any F&B outlet. While vendors are constantly working to make them more rugged and reliable, it’s essential to do everything possible to protect them and maximize their reliability. Downtime costs money.

Wireless networks

Wireless networks are becoming much more common in F&B outlets, both for the staff using handheld terminals for order-taking in spread-out operations and, in appropriate environments, for guests’ Internet access.

Although they seem to offer much more freedom of installation, in reality the transmitter/receiver base stations/access points must be carefully positioned to ensure complete signal coverage, especially in larger outlets. A signal strength survey must be done prior to installation to identify the best locations for the access points, and cabling must be run from those positions back to the system server or network hub.
**Internet**

Installing Internet access for an F&B outlet is almost a no-brainer these days. Most restaurants and bars will benefit from at least a point-of-presence Web site with contact details, and managers and chefs will need Internet access for e-mail and for research. It’s also both important and valuable to make full use of search engine optimization to drive business via your Web site. Restaurants have to fight for visibility along with every other guest destination.

Placing orders over the Web is becoming more popular for specific situations such as take-out outlets, or over a company intranet for staff cafeterias. The orders are often held on line and fired to the kitchen at a pre-determined interval before the requested pick-up time.

Installing broadband service at an outlet with appropriate firewall security can also provide public high-speed Internet access (HSIA) for all kinds of guest services as well as for other use such as credit card settlements. For example, wireless terminals at the Kentucky Derby allow patrons to place F&B orders, but also to bet, check handicapping data and watch videos from other tracks.

Multi-unit operations, of course, often use the Internet as the two-way link back to the corporate office, usually for access to the local systems data and to download new menu items and pricing. Corporate Intranets are also invaluable for quick and flexible access to operations manuals, discussion forums, company news items, a corporate documents library, e-mail between sites and many other purposes.

Given enough bandwidth, chains can also use on-site video cameras to check on operations remotely and to help train staff by monitoring their actions. Careful use is obviously required with this! It’s great to keep an eye on how busy a restaurant is, or to pinpoint a new server who’s having trouble with some basic functions and provide specific training, but if the staff feel that they’re being spied on all kinds of issues can arise.
SUMMARY

F&B management isn’t going to get any simpler or easier. It’s always going to rely on creative people to set the atmosphere, and on people-focused managers to provide excellent guest service and to keep a motivated, guest-focused staff happy and productive, in a world with slim margins and traditionally high employee turnover.

We’re getting to the point, though, where systems integration can make these tasks easier through more complete, integrated systems that provide better data consolidation and analysis and reduce the bottlenecks between different systems—or indeed eliminate the staff’s awareness that there are different systems. Like all the best tools, they become intuitive and invisible to their most practiced users, and creative managers will take full advantage of them to maximize both guest satisfaction and profits.