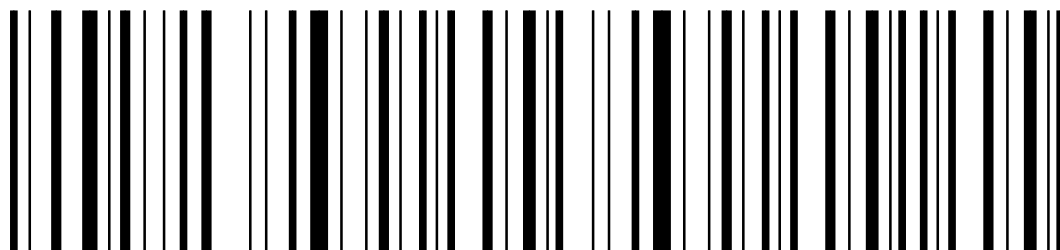


Printing Technology for Hospitality Venues



A P P L I C A T I O N W H I T E P A P E R



Zebra Technologies

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Executive Summary

Building customer loyalty is critical to profitability in hospitality and allied industries. While most operators recognize this and commit significant resources to attracting and retaining their customers, their efforts are often hampered by inflexible computer systems that cannot capture important customer information or provide services exactly when and where they are needed. Emerging point-of-service technology—including customer loyalty cards, portable check-in stations, and mobile payment systems—enable hospitality providers to improve customer service, enhance staff productivity, and increase revenue while leveraging previous investments in existing financial, facility management, and database software applications.

This paper describes customer loyalty and point-of-service applications for hospitality, restaurant, theme park, stadium, and special event industries. It also profiles the leading technologies that enable these applications, including card printers, mobile transaction systems, ticket and receipt printers, portable computers, and wireless networking.

Introduction

Bed-and-breakfast operators and small-restaurant owners may long for the cash flow of large hotel and restaurant chains, but their counterparts in these corporations envy the close relationships small proprietors have with their customers. Hotels, airlines, restaurants, and entertainment promoters continually show their willingness to invest heavily in initiatives that bring them closer to their customers. That is why our wallets are filled with customer cards from retailers, airlines, and hotels, and our mailboxes are filled with catalogs, coupons, and other “special offers for valued customers.” Data mining and other information systems have helped make marketers very effective at targeting and reaching their customers. Too often, however, the wealth of information about customers is not available at the point of service, causing businesses to miss incremental revenue opportunities and leaving the potential of customer management systems unfulfilled.

Cards and mobile computers give operators a means of collecting and processing information in an exciting range of new environments. Mobile printing technology enables users to convert the information into new product and service offerings. Mobile printing systems close the loop by providing a method to output information that is gathered and processed, maximizing the benefits and flexibility of new customer service applications. In many such applications, the output is the compelling part of the solution as it acts as necessary user documentation for the transaction.

Innovative companies are connecting information to opportunity by extending their information systems to the point of service with customer ID cards, portable computers, print systems, and wireless communication. By providing these information tools to service staff, companies are enjoying improved labor efficiency, greater customer satisfaction, and increased revenues. Automation at the point of service also helps companies capture valuable real-time information that makes customer relationship management (CRM), service management, and database applications more effective.

New applications include remote check-in and other line-busting services; payment processing at tableside, pool, lounge, or lobby areas; instant issuance of coupons, tickets, and gift certificates; mobile gaming; and portable and temporary retailing.



A p p l i c a t i o n s

Evolving customer identification and point-of-service technologies encourage new business processes that can provide a tremendous return on investment (ROI), strengthening loyalty and creating new revenue opportunities while improving operations efficiency by reducing the amount of labor required to offer services.

Loyalty applications help retain high-yield customers, provide differentiation from competitors, and collect consumer intelligence that enables sophisticated targeted marketing. Applications that reduce lines and allow for new services also contribute significantly to customer loyalty. New revenue-generating applications such as mobile gaming and temporary or portable retailing help produce more spending per customer visit while enhancing guest satisfaction. Some of the most exciting and potentially lucrative applications are described below.

Loyalty

Investments in customer loyalty provide a strong ROI and are especially effective when compared with the marketing, sales, and promotions expenses of identifying and attracting new customers. Loyalty makes customers more profitable over time, helping to offset high initial customer acquisition costs. The best way to improve loyalty is to understand what customers want and to make the services available to them on demand. Identification and point-of-service systems offer the means for gaining customer knowledge and for efficiently providing valued services. In addition, loyalty cards can drive in-store coupon systems that are important to retailers trying to influence customers' buying patterns. By using loyalty cards that interact with store coupons, retailers can redirect customers to sale items more effectively.

Loyalty cards enable businesses to track customer behavior over time, leading to the creation of profitable new promotions and services. Good loyalty programs also provide convenience and benefits to the consumer, which results in additional visits and increased spending. By taking advantage of a computer chip, bar code, or magnetic stripe, loyalty cards can be used for multiple applications, such as customer identification, cashless payment, and controlling access to VIP areas, special elevators, health clubs, vending machines, and other facilities and equipment. Creating multiple applications allows different departments to share card equipment and reduces the ROI period.

For example, the Pau Billere Golf Club in France uses a card printing system to create photo ID cards for its members and badges for club visitors. Member cards have a chip that stores details of the membership program, access privileges, handicap, scoring, and tee-time preferences. The cards are also used to authorize cashless payment at the club bar, restaurant, pro shop, and golf ball dispensers, which encourages more spending and has reduced fraud and vandalism at the facility.

If chip encoding is not required, mobile printers can be used to create loyalty, customer appreciation, and special promotion cards and coupons. Colorful cards can be produced when and where they are needed on a variety of durable materials and may include bar code and magnetic strip encoding.

Identification

The same printers used to create loyalty cards can also be used to issue day passes, visitor and temporary worker identification, secure gift certificates and gift cards, employee ID badges, and more. By using cards to control access to health club facilities, business centers, pools, parking garages, and other areas, facility managers can lower personnel costs by reducing the number of clerks and security guards needed.



Multifunctional ID systems can also be used to facilitate new premium service packages and other revenue-generating opportunities. Magic Waters, a water park in Rockford, Ill., provides its guests with wristbands that serve as secure admission tickets that cannot be counterfeited. The wristbands are used for cashless payment throughout the park and for access control to rides and attractions. The park has found that this cashless payment feature has led patrons to spend more during their visits and also saves staff time in balancing and cash management. Other amusement parks use similar systems to enable guests to “check in” to lines for an attraction, receive a reservation slip from a receipt printer, and return at the designated time. This greatly improves visitor enjoyment and satisfaction, makes lines more manageable, and can be sold as a premium service.

Both card and label printers can be used to make name tags for conferences, meetings, receptions, and other events. Because they offer outstanding print quality, speed, and ability to produce color graphics, event organizers can create professional-looking name tags on demand, eliminating time and expenses wasted creating preprinted badges for people who do not show up. Creating name tags with mobile printers lets staff greet guests anywhere, reducing lines and crowding.

Ticketing

Mobile printers can also create distinctive tickets for drinks, meals, door prizes, and admission to conference sessions and performances. Printing tickets on demand at any location enables organizers to reduce lines and crowding. Mobile units also save valuable space and are very cost effective compared with building and equipping new ticket counters.

Mobile ticketing produces revenue for dozens of leading thoroughbred and dog tracks and off-track betting facilities throughout the country. Clerks use handheld computers and mobile printers to accept wagers from patrons at their seats in the grandstand, in the restaurant, or anywhere else in the facility. Wireless networks quickly process the wagers and enable the facilities to process more transactions before post time. By improving convenience, wagering facilities can take more bets from each patron. Similar systems are also used to sell lottery tickets and could be adapted to print bingo cards.

Portable POS

Portable point-of-sale (POS) systems are used to sell many products besides tickets and wagers. Sporting events, concerts, and traveling shows use mobile computers and printers to create an automated, computerized information systems infrastructure wherever they set up. Mobile printers enable vendors to quickly create quality receipts and inventory tracking labels anywhere—indoors or out, even if there is no power source handy. Concessionaires at stadiums and arenas worldwide use mobile computers and printers to accept credit card payment from fans in their seats, which helps drive more sales.

London Eye, a towering structure whose sweeping views of London make it the leading visitor attraction in the U.K., uses handheld computers and Zebra® mobile receipt printers with integrated credit card readers to sell refreshments and souvenirs throughout its facility. Retail space is limited and the London Eye is usually crowded. The mobile point-of-sale system allows operators to capture revenue that might have been missed from visitors unwilling to wait in long lines.

Mobile Check-In

Similar to portable POS, mobile check-in systems allow airlines, hotels, car rental agencies, and other service providers to serve customers wherever they want to be served. Making the check-in process more convenient saves guests time—time that can then be spent at the facility’s restaurants, coffee stands, lounges, and gift shops.



American Airlines® was a mobile check-in pioneer with the OneStop service it offers at dozens of airports around the world. The application enables skycaps—equipped with wireless mobile computers and printers—to check in passengers at curbside and other locations. OneStop transactions are processed in less time than at the counter, which is especially appreciated by hurried travelers. Boarding passes can also be printed by mobile agents during peak periods. Mobile printers use a less expensive bar-coded media instead of magnetic striped card stock, which facilitates significant cost savings for American. American says it improves customer satisfaction and gains future travel business by offering its passengers this convenient option.

As travelers continue to gain experience with curbside check-in and e-ticket kiosks, the offerings are expected to grow and spread to more venues. One leading fast-food chain is conducting a pilot program using mobile computers and printers to take orders while customers are waiting in line. Orders are sent wirelessly to the kitchen for processing, and the printer gives the customer a ticket to present at the cash register for payment, or accepts immediate payment from a debit or credit card.

The Oak Tree Inn in Green River, Wyo. offers its guests the capability to check in on the shuttle bus ride to the hotel. Mobile printers and computers assign rooms, take credit card deposits, encode room keys, and print room directions. When leaving the hotels, guests can pay their bills and receive a complete printed folio on the bus.

Line-busting applications such as mobile check-in and portable POS are extremely powerful because they benefit the customer and the service provider. Deploying mobile equipment is much less expensive than building additional counters and workstations. It also improves space utilization and provides a convenient way for businesses to manage peak traffic times effectively. Customers value the convenience and time savings, which improves loyalty. Investing in quality mobile systems that comply with industry standards provides a framework to add new applications easily in the future. For example, hotels can use the same equipment to assist guest check-in, print coat-check and luggage tags, generate room-service receipts, create tickets and name tags for meeting attendees, and provide tableside payment processing during peak times at restaurants.

Many of the applications described above were not practical until recently because card personalization equipment was too expensive, and flexible, standardized mobile systems were not available. Now, businesses can easily produce all types of cards and tickets on demand and support them with handheld computers that rival the speed, processing power, and applications of desktop PCs. The following section describes current point-of-service technologies and how specific functionality can lead to profitable new service offerings.

P o i n t - o f - S e r v i c e T e c h n o l o g i e s

Card Printers

The development in recent years of affordable, high-quality card printers has given business owners a powerful tool for marketing and business development. Clubs, hotels, restaurants, and retail stores can produce colorful, professional membership cards to set themselves apart from their competitors and give their customers a sense of pride and value that translates into more visits and more revenue. Unlike ID card systems of the past that did not allow customization or required time-consuming photo processing, cutting, and laminating, today's digital printing systems enable completely automated production of highly customized, secure cards. There is a wide variety of card printers to meet user needs, including high-duty cycle models that can produce more than 30,000 cards per year.

Digital card printers can create durable, full-color plastic ID cards in seconds while the customer waits. Client photos can be included easily by interfacing a digital camera to the system. Customer information and privileges



can be securely encoded on the card to safeguard privacy, send data to point-of-service software applications, provide access control to facilities and equipment, and enable cashless payment.

Card printers use either thermal transfer or dye sublimation (also called dye diffusion) technology to create text, pictures, and graphics on PVC card stock. Dye sublimation produces higher print quality and is recommended for photo ID cards. Thermal transfer models also offer outstanding quality and are a lower-cost option if photo printing is not desired. Both methods print color and graphics and support multiple data encoding options.

Data can be encoded into bar codes, magnetic stripes, and even computer chips from desktop card printing systems. Bar code is the lowest-cost and least flexible encoding option. It is a read-only technology, which means the encoded data can never be changed. The amount of data that can be encoded depends on the size of the bar code and is limited to about 30 characters on an ID card. Two-dimensional (2D) bar codes can include significantly more data, including complete customer contact information, but are also a read-only technology. 2D symbols can also be used to encode digital photographs. Bar codes can be created on the least expensive card stock and remain readable for years under normal usage conditions.

Magnetic stripe cards can carry more data than standard bar codes but require more expensive media. Card issuers stock blank magnetic stripe cards and encode them on demand with an inexpensive accessory to the printer. Chip cards (commonly known as “smart” cards), must also be stocked and are encoded with an accessory. Smart cards can hold the most data of any medium discussed—up to 100 times more than a magnetic stripe card—and may also include a processor chip that enables multiple applications. They can be used to store monetary value, records, and access privileges securely, and can serve as a portable database because they are read-write (i.e., information can be changed or added).

Many building access control systems deploy proximity and/or vicinity cards to activate electronic gates and door locks. Some desktop card printer models are optimized for printing high-quality photo images on uneven proximity or vicinity card surfaces. Encoding of the access control card at the same time the card is printed is accomplished with proximity or vicinity card encoder devices integrated into the card printer.

Mobile Printers

Savvy service providers are also taking advantage of developments in traditional printing technology to improve customer satisfaction while reducing operations costs. By handling select print jobs with small, mobile units instead of centrally located desktop printers, operators are improving staff productivity, lowering overall printing expenses, and efficiently satisfying their customers at the point of service.

Leading venues like Opryland and Starwood Resorts have followed the lead of airlines and car rental agencies and now use mobile printers to improve guest service at check-in, check-out, luggage check, and meeting facilities. Racetracks and casinos have captured additional revenue by offering mobile gaming and using printers to issue betting slips, lottery tickets, or bingo cards. Mobile printers can also be used to offer temporary passes, VIP tickets, coupons, and courtesy cards without requiring customers to wait in long lines.

Entertainment venues are using Zebra mobile receipt printers to ease the ticket-purchasing experience for customers. Theaters allow customers to print a bar code on their home computer; the theater attendant scans the bar code and a ticket stub prints from a mobile printer. Moviegoers know they have a seat reserved for the show and can skip the long ticket line. This helps decrease lines in the theater and also attracts customers who may not go to the theater otherwise because they are not guaranteed a seat.

The current generation of mobile printers are lightweight, easy to use, durable, and offer outstanding print quality and graphics previously found only on less portable tabletop printers. Many offer a wireless interface



that allows connection to enterprise networks and applications from anywhere in the facility and have integrated credit card readers for payment processing. Mobile printers can produce high-quality labels, receipts, coupons, and tickets using a variety of media. They are typically used in conjunction with handheld or wearable computers.

In wireless applications, the portable computer usually runs the application and serves as the connection to the network, with no direct printer connection to the network. The printer receives its commands from the portable computer through either a cabled, infrared (IR), or radio frequency (RF) connection. Because mobile printers are designed to be compact and easy to carry, most wireless models use an internal radio or IR connection. RF applications require a radio in the printer plus a radio and controller board in the portable computer. IR applications use the standard port built into each device.

Because mobile printers can be worn on a belt or a strap, some users prefer to put the network connectivity board into the printer to keep the handheld device as light as possible. Another popular option for wireless connectivity is the Zebra Portable Radio. This clip-on unit attaches to Symbol Technologies' SPT 1700/1800 Palm OS® and PPT 2700/2800 (Windows® CE) handheld device and adds short-range, point-to-point radio connectivity in less than 8 ounces (227 g).

Wireless mobile printing systems are easy to set up and use. The only difference users notice is the lack of awkward cables connecting the printer to the portable computer. While choosing to go wireless benefits nearly every mobile printing application, there are other important factors to consider to maximize the efficiency and performance of a mobile printing application. These factors are described briefly on the next page.

Ergonomics

Mobile printers must be comfortable and easy to use or they will not deliver any productivity benefits. While overall weight is important, balance, grip, and ease of carrying and operation should not be overlooked. Weight is less of a factor if the printer is not carried by hand. Mobile printers are available in handheld, belt-clip, or over-the-shoulder models to meet a variety of application needs and user preferences.

Power Management

How the printer manages its power supply is very important to overall battery life and application effectiveness. Battery life varies widely based on how the printer is used. Print volume, label size, the amount of wireless transactions, and other factors affect how long batteries last before needing to be recharged or replaced.

Users should test their applications to ensure that the batteries they use consistently perform as needed and do not contribute hidden expenses to the total cost of ownership. For example, Nickel Metal-Hydrate (NiMH) batteries have a higher initial cost than Nickel Cadmium (NiCAD) products, but have less performance degradation over time, are more efficient at holding their charge, and have a longer life span. Lithium-ion (Li-Ion) cells represent the latest in mobile battery technology. Though more expensive than either nickel cadmium or nickel metal-hydrate cells, lithium-ion cells offer the highest power-to-volume and power-to-weight ratio of the three. For example, in a typical printer application, a lithium-ion battery pack producing 7.2 volts has 30% more power than a nickel metal-hydrate pack, with half the volume and weight.

Media

Modern mobile printers accept a variety of label, tag, ticket, and other media for producing durable bag tags, coupons, receipts, name badges, security marks, signs, and other labels. Many types of linerless media are also available, which eliminates the waste and disposal problems associated with peel-away liners used with adhesive labels.



Mobile Computers

Easy-to-use mobile devices are available to process any type of card technology while also providing full computer functionality to run point-of-sale, table management, transaction processing, facility management, and customer service applications. Many different form factors are available, including handheld, tablet, wearable, and point-of-sale models. It is easy to find equipment that can read multiple-card technologies, so users enjoy flexibility in developing loyalty, security, and employee identification applications.

Cards can be read with portable computers or with dedicated readers that are wired to a host computer or enterprise network. One of the most exciting recent technology developments for the hospitality and entertainment industries is the emergence of wireless networking technology.

Wireless Technologies

Many business travelers and students use laptops and PDAs with built-in wireless connectivity for use in public-access “hot spots” in airports and hotels. The Starbucks® coffee chain recently announced it was implementing the infrastructure to offer wireless Internet access in thousands of its shops. Hospitality, restaurant, amusement park, and other venue operators can use the same technology to create new service and revenue opportunities while simultaneously improving their own operations.

Wireless technology is also used to replace cables between mobile computers, printers, POS stations, and other devices. These cable-replacement applications improve workstation ergonomics, safety, appearance, and often have a lower total cost of ownership than cabled equipment, which breaks more often. Cable replacement and networking use different types of wireless technology that are profiled below.

802.11

The dominant wireless networking technology used for public access and enterprise applications is 802.11b. It allows up to 11 Mbps (megabits per second) data rates. Also referred to as Wi-Fi™, 802.11b is an open standard used worldwide and supported by numerous vendors. It is one of the 802.11 (pronounced eight-oh-two-dot-eleven) series of wireless networking standards developed and maintained by the Institute of Electrical and Electronics Engineers (IEEE). All the 802.11 standards enable wireless connections with standard Ethernet networks, and differ mainly in data transmission rates and frequency allocations.

Many other standard and proprietary wireless networking protocols are in use throughout the world. The IEEE 802.11a standard specifies data transfer rates five times faster than 802.11b and is attracting renewed interest even though it has been available for years with little adoption. Wireless vendors offer proprietary, non-interoperable networking technology, but most also support 802.11b and focus most of their product development efforts on standardized technology. By installing a standardized wireless infrastructure, businesses can seamlessly use computers, printers, POS terminals, and other devices from different vendors on the same network.

Wireless Printing

When businesses first began using portable computers, most applications ran in batch mode. Because of the development of global, widely accepted standards and low-cost devices, wireless has displaced most batch applications because of the convenience and cost savings it provides. Mobile printing is undergoing a similar transformation, with wireless rapidly gaining acceptance for many of the same reasons.

In traditional configurations, the printer is physically connected to either a host device (usually a PC for tabletop printers and a handheld computer for mobiles) or to a local area network (LAN). Connection to the host is



through a cable and connection to the network is by network cable. In wireless printing, the cable or network connection, or both, is replaced by a wireless interface. There is no loss of functionality when the physical connection is replaced by a wireless one.

Different wireless interfaces are available and are selected based on the application and required performance. For cable replacement applications, the printer and host device (usually a handheld computer, but sometimes a PC, digital scale, or other device) must each be wireless-enabled. Data transmission range is usually small, up to a few feet or meters.

Wireless Network Printing

Networking applications require the printer to be wireless-enabled (either through factory-installed native ability or through add-on peripherals such as modems or expansion cards) and a wireless network infrastructure. The wireless network includes antennas that provide coverage throughout the building and base stations to process transactions. In wireless networks, printers, portable computers, and other devices are the clients and the base station is the server. The base station is usually integrated into a wired network providing access to the complete IT system. Printers on a wireless 802.11 network have an IP address and appear like any other device on the network.

Most wireless networks require a license to operate and should be installed by experienced professionals who conduct a site survey before designing the network and installing the infrastructure equipment. Zebra Technologies' wireless printers and accessories have been designed to be compatible with leading wireless networks currently used in hospitality and public access environments.

In all wireless applications, data transfer rates decrease as range increases. Speed and coverage may be improved by adding repeaters and additional antennas to the network.

Cable Replacement

Radio frequency and infrared light (IR) technologies are both used for cable-replacement applications. Almost all infrared products can be used with one another because they use the standard set by the Infrared Data Association (IrDA). The RF environment is less homogenous. Wireless cable replacement technologies are profiled below.

Short Range Radio Frequency (SRRF)

Short range radio frequency technology (SRRF) is primarily used as a cable replacement to enable communications between a mobile printer and a portable computer. Power output is low, which limits data transmission range and minimizes interference with other radio devices. SRRF products are available in the 916 MHz and 2.45 GHz frequencies to provide flexibility and allow compatibility with inconsistent frequency allocations around the world.

Infrared Light (IR)

Infrared is the only nonradio technology used in wireless printing. It employs infrared light signals, the same technology used in television remote controls. IR is used for cable replacement but not for networking. Unlike all RF technologies, infrared communications requires a direct line of sight between the devices that are communicating. If the line of sight is interrupted, data may be lost and the transmission must be retried. It can take up to 8 seconds for IR devices to re-establish contact following an interruption. IR is often found in older devices, and many proprietary IR transmission protocols are in use. Most currently available devices use IR protocols that conform to the IrDA Line Printer version 1.1 standard.



Some portable computers that use RF for cable replacement or networking also use IR to transfer data when the computer is placed in its communications cradle (where range, line of sight, and speed limitations are not factors). In this application, IR is used in place of physical contacts, which tend to wear over time.

Bluetooth™

Bluetooth is a standardized short-range RF technology. With its colorful name, it has attracted a lot of attention since it was first proposed a few years ago. Bluetooth was developed as a wireless personal area networking (PAN) technology to allow computers, printers, and other devices to interface with each other in peer-to-peer networks without going through a centralized hub or server. Bluetooth got its name from an ancient Danish king who united Denmark's many tribes, leading to a period of prosperity. Technical developments and standards certification is handled by the Bluetooth Special Interest Group, which has hundreds of members from the computing and communications industries, and seeks to unite them in the development of easy-to-use wireless network standards.

There were initial concerns that Bluetooth devices would cause interference for other wireless networks used in retail and industrial settings. Testing by the Wireless LAN Association (WLANA) showed that not only could Bluetooth coexist with other common wireless networks, but is well suited as a cable-replacement technology. Bluetooth was developed to enable devices to interface with each other within a 30-foot (9 m) range, independent of a server or access points. The technology allows a maximum of eight devices communicating with each other in what is called a piconet. Bluetooth should be considered for cable replacement applications and its price-performance value assessed accordingly.

C o n c l u s i o n

Technology developments create opportunities for new business processes. Businesses ranging from large international hotels and airlines to small parks and attractions are profiting by developing applications that take advantage of new point-of-service technology capabilities. Loyalty programs are improving customer margins, and portable payment systems are bringing in additional revenue, while mobile check-in and other point-of-service applications are increasing operations efficiency.

As the leading provider of mobile, wireless, and card printing systems, Zebra Technologies has the most experience in working with customers to create new systems that deliver business value. Contact us at www.zebra.com or call +1 800 423 0442 to take advantage of the latest innovations to improve your revenue and customer satisfaction.



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GSA#: GS-35F-0268N

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13062L Rev. 2 (11/03)