

PERVASIVE RETAILING JOURNAL

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eSIGNAGE: FUSING DIGITAL DISPLAYS AND WIRELESS TECHNOLOGY

By Robert Assimiti

In today's retail environment, growing consumer expectations are driving retailers to seek a technological edge to boost their competitive advantage. Price labeling and signage, specifically, is an area where retailers have recently sought improvements in the search for that edge.

Conventional, paper-based signs require manual, labor-intensive replacement that is expensive and error-prone. In fact, studies have shown that paper signs have a discrepancy level of 10 percent or more.

Traditional signs also limit a retailer's ability to optimize pricing through proactive and dynamic merchandising. Unsynchronized pricing across the retail chain results in lost revenue from inefficient price promotions and delayed execution of merchandising plans.

The development of digital eSignage technology has emerged to bring forth a new wave of in-store signage that attracts and appeals to customers, automates manual processes and cuts costs across the retail enterprise.

eSIGN TECHNOLOGY

An effective eSignage system combines advanced display, wireless and battery technologies, and uses three major components – a
"eSignage," continued page 5



MOBILE PHONES EMERGE AS PAYMENT DEVICES

By Christophe Heurtevent

In little more than 10 years, cellular phones have become fashionable must-have items, whereas it took the automobile and television several decades to reach the same level of popularity. Even the most optimistic couldn't have forecast such a development!

Some countries report nearly a 100 percent adoption rate, so it's not surprising their capabilities have sparked a digital convergence that is driving the next generation of mobile devices and lifestyles. Cell phones have quickly morphed into multifaceted communication devices, integrating voice, text and images, to enable the "anywhere, anytime" mobile lifestyle.

FUELING A DIGITAL CONVERGENCE

Cell phones have become cameras, music players and personal assistants. When

equipped with near-field communication (NFC) chips, they function as ATM cards and classic media, and open windows of promising opportunities in "mobile marketing" for retailers and their brands.

Considering today's targeted marketing plans, cell phones possess two strong advantages: they identify and verify their owners.

PAYING WITH A CELL PHONE

Paying with a cell phone is only one of many emerging applications for NFC. It is probably the most promising, though, because it offers a real service for consumers. In Caen, France, it took just a few months for NFC-equipped mobile phones to supplant ATM cards as the preferred method of payment for more than 200 shoppers a day during a pilot at the Monoprix and Galeries Lafayette stores.

"Mobile," continued page 5

INSIDE THIS ISSUE

10 MYTHS ABOUT
PCI COMPLIANCE

SERVICE-ORIENTED ARCHITECTURE
(SOA): THE CORE OF NEXT-
GENERATION STORE SOFTWARE

SPOTLIGHT: SELF-CHECKOUT

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SAAS TO COMPOSE 25 PERCENT OF NEW BUSINESS SOFTWARE BY 2011

Software as a service (SaaS) represented five percent of business software revenue in 2005 and, by 2011, 25 percent of new business software will be delivered as SaaS, according to Gartner, Inc. The adoption of the SaaS software delivery model has varied significantly by market segment. SaaS accounted for eight percent of CRM total software revenue in 2005, and Gartner estimates 2006 SaaS revenue to reach 12 percent of total CRM software revenue.

SOURCE: GARTNER, INC.

RETAILERS USE BUSINESS INTELLIGENCE TO IMPROVE MERCHANDISING PROCESSES

AberdeenGroup says 58 percent of retailers use business intelligence (BI) technology to improve merchandising processes such as advanced planning and replenishment. In addition, more than two-thirds of retailers that use BI for merchandising indicated that senior executives, including the CEO, are actively engaged in its use within their organization. The study also finds that the need for better operational efficiency and improved customer response time drives retailers to budget new BI programs or upgrade existing internal data management processes.

SOURCE: ABERDEENGROUP

10 MYTHS ABOUT PCI COMPLIANCE By Nigel Tranter

The Payment Card Industry (PCI) Security Standards Council was founded to provide guidance on systems, policies and procedures for credit card payments. This council is funded and supported by MasterCard, Visa International, Discover, American Express and JCB.

On Sept. 7, 2006, the new PCI Standard version 1.1 was released by the PCI Council. It is a significant enhancement over version 1.0 and has clarified many areas of ambiguity in the original standard. However, many merchants still have misconceptions on the standard's meaning. This article puts these myths to rest:

- 1 *PCI isn't important or relevant for stores that only accept a handful of cards.*** If you are a merchant and you accept credit cards – regardless of transaction volume – then you must comply with the standard.
- 2 *PCI only applies to E-commerce companies.*** Not true. PCI compliance applies to every company that stores, processes or transmits cardholder information. In fact, any merchant that takes card-present transactions on point-of-sale (POS) devices is more at risk than E-commerce retailers, because sometimes these types of transactions inadvertently store track data, which is forbidden under PCI. Disclosure of this data brings heavy fines and requests for compensation from the banks involved.
- 3 *It's OK to comply with a majority of the PCI criteria.*** The pass mark for PCI is 100 percent. The PCI standard is not a goal to strive for; it's a baseline that all retailers who accept credit cards should aim to exceed.
- 4 *If a store only processes credit cards, PCI isn't relevant.*** Whether they process, store or transmit credit card information, retailers must comply with the PCI standard.
- 5 *PCI compliance can wait until the business grows.*** The standard applies to all sizes of business, and waiting could be costly. If you're compromised and not compliant, the fines and compensation sought by banks could be substantial.
- 6 *Answering "yes" to everything on the self-assessment is good enough.*** The self-assessment merely ascertains your compliance level with the acquiring bank. The standard applies at all times, and just answering "yes" to all questions on the assessment without actually meeting all requirements puts the merchant at great risk.
- 7 *Compromised credit cards are not a liability for the retailer.*** Merchants are liable for a compromised credit card and may have to pay for recovery costs incurred by the banks.
- 8 *It's acceptable to wait for the bank to ask our store(s) to be compliant.*** Merchants are responsible for ensuring compliance *now*.
- 9 *If a retailer hasn't signed a commitment to PCI standards, it's not necessary to comply.*** The standard is part of Visa regulations that retailers must adhere to when operating merchant accounts. Retailers commit to these regulations when the merchant opens a bank account. Young business or old, PCI standards apply if you store, process, or transmit credit card data.
- 10 *Merchants can store any data from customer transactions.*** Many merchants erroneously believe that they own the customer and have a right to store all data about that customer to help their business. PCI regulations specifically forbid storing the following information: unencrypted credit card number; CVV or CVV2; PIN blocks; PIN numbers; and track 1 or 2 data. Storing this data can result in serious consequences, especially if the information is compromised.

Fortunately, the story is not entirely negative. Merchants of all sizes have and can achieve PCI compliance. Seeking compliance now is a sound move to secure the future of your business.

Editor's note: Nigel Tranter is a partner with PSC, a specialist consulting firm focused on payments and security.



SERVICE-ORIENTED ARCHITECTURE (SOA): THE CORE OF NEXT-GENERATION STORE SOFTWARE

By Keith McNamara

Greater flexibility. Tighter collaboration. Shorter cycle times. Better use of existing intellectual capital.

Every retailer knows how any of these benefits would improve the power and effectiveness of a store's IT programs and systems. What many might not know, however, is that all of these operational benefits can be delivered through solutions that leverage a Service-Oriented Architecture (SOA). Today.

The move toward broad SOA adoption is continuing to gain momentum in retail technology circles. According to a recent study from the Retail Systems Alert Group, 37 percent of respondents are actively developing a business case for moving applications to SOA support, and 11 percent are already fully committed to an enterprise-wide SOA implementation.

The rapid emergence of SOA isn't just happening among retailers. In fact, as the Retail Systems Alert Group study notes, "the growing momentum surrounding the adoption of SOA across all business segments is one of the most significant technology-driven initiatives since the emergence of the Internet."¹

With such a powerful new technology trend – and major paradigm shift – in the market, it's important for retailers not only to understand the benefits an SOA-enabled environment will offer, but also the potential roadblocks and challenges that can arise from poorly executed endeavors. Integrating new store systems with existing applications and devices has always been hard, and using a new service-oriented architecture is itself neither

trivial nor easy. But with the overarching benefits SOA offers retailers, the rewards are more than worth the effort.

SERVICES. OPPORTUNITIES. ADVANTAGES

On the most fundamental level, a service-oriented architecture can be described as a collection of disparate IT services that are able to communicate with each other in a data network. Rather than requiring a single code base to perform their specific tasks, individual applications and components provide distinct business logic or workflow "services" that essentially can stand alone.

With SOA, one application service can expect another application service to perform a specific task, in much the same way as distinct tasks are handled on an automotive assembly line, where each station on the line performs a single, pre-determined task. This "loosely coupled" approach enables the IT system to change, update and add functionality within one component without affecting another component or application within the system, given there is no change in the system's existing business rules.

When thinking of SOA, one must understand these four basic components:

- A **"service bus"** sends messages between components via a standard, well-managed and well-documented methodology;
- A **work flow "broker"** or **"traffic cop"** manages the application flow of what comes next in an "if-then" scenario;

"SOA," continued page 4

PERVASIVE RETAILING TRENDS

CORRELATION SHOWN BETWEEN PRECISION MARKETING COMPETENCY AND ROI

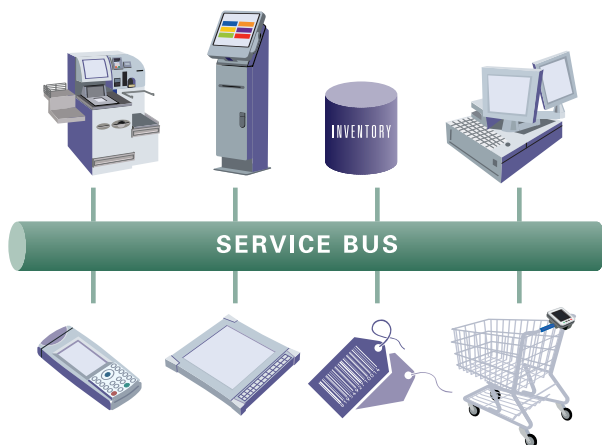
According to an Aberdeen-Group study, effective precision marketing techniques lead to improved customer retention rates, greater revenues from up-sell and cross-sell marketing campaigns and enhanced levels of customer satisfaction. Moreover, top performers enjoy a greater share of each customer's wallet. The survey shows more than 50 percent of top performers' customers purchase multiple products or services from them annually – twice the rate of all other survey respondents.

SOURCE: ABERDEENGROUP

MOBILE ADVERTISING DEVELOPERS NEED TO RETHINK BUSINESS MODELS

IDC says the promise of wireless as an effective, powerful tool for reaching targeted market segments makes it the hottest new medium for advertising and marketing. After mobile advertising trials and experiments by the U.S. wireless and consumer brand communities, IDC believes wireless service providers and advertisers should revise their business models and adapt to a range of issues, including different wireless user tolerances and receptivity to mobile ads; advertising that relates to individual user characteristics; and creating ads that are effective and engaging, yet unobtrusive.

SOURCE: IDC



SOA

CONSIDERATIONS

Assuming you've developed a strong business case and are now ready for a Service-Oriented Architecture, here are a few suggestions based on successful SOA implementations at leading retailers:

- Don't just review technology choices on their feature/function criteria alone. Consider how your choices will affect future integration needs... in one, three, five and even 10 years.
- Identify how much technology change you expect to see in your stores over the next few years.
- Think about the competitive landscape and what consumers are going to demand in the foreseeable future.
- Establish formal integration architecture models. For example, separate plans for stores and headquarters are necessary to address their different operating environments.
- Make sure that integration capability is part of all new and old technology reviews.
- And finally, don't skimp on management tools. SOA is about future change and the ability to deliver and deploy new applications with enhanced time to market, flexibility and reduced risk. Management tools are essential for making it all happen – time and again.

“SOA,” continued from page 3

- **Business rules**, such as sales promotions, customer loyalty data, price changes, daily sales and other retail-centric initiatives that influence interconnected processes;
- **User interfaces** to manage and control POS and other store technology applications, as well as a multitude of interconnected store hardware devices.

The main advantage – and breakthrough – this architecture offers is its ability to make, for the first time, pervasive network integration a major, real-world benefit in the retailing environment. With SOA, it's now possible to quickly integrate historically disparate IT resources with each other, as well as bring tighter linkage between independent data applications that have operated as silos in the past.

Faster application changes and new technology capabilities provided by SOA components not only streamline IT operations, but help deliver on the most important measurements of all in retail – the bottom line.

MAKING A POINT OF SUCCESS

Service-Oriented Architecture gives retailers the ability to adhere to and build upon industry standards without artificially jettisoning their legacy systems and current IT investments. From a time and cost perspective, such a speed advantage is clearly an important benefit, but SOA early adopters have had to fight hard to ensure that coding-related concerns don't move ahead of application design considerations.

Answering the “how it's built” question correctly is considerably more critical.

Development time is merely one factor in the holistic picture of how quickly an application gets deployed into stores. Retailers who focus on the larger, business process-related concerns are already competitively ahead in launching savvy, store-centric solutions and gaining a 30-40 percent reduction in total project time through SOA.

The success of these SOA-savvy retailers is enabled by addressing some of the least discussed – but most important – design and implementation factors, such as testing, bug fixing and issue resolution. SOA's design patterns allow the IT team to encapsulate bugs, issues and last minute changes into the “unique service” each provides, thereby speeding turnaround time and resolving issues with minimal impact on the network.

SOA's ability to speed the change management process and allow new code to deploy into stores is further enhanced by dividing applications into their “service component” parts. Many applications are now being developed with an SOA message bus being built within the application framework, offering the ability to send and receive data within a transaction to and from any source within a retailer's enterprise. Such an approach helps to further reduce integration efforts, while providing added flexibility.

As noted by Dennis Gaughan of AMR Research, “SOA is not a single product: it is an architectural approach designed to support maximum flexibility and reuse of existing assets.”² This flexibility allows retailers to use many of the functions they already have in place (regardless of their age or implementation style), as well as to add other functions without concern.

But from a broader, bottom-line perspective industry wide, the emergence of SOA is being driven by the retailer's “need for speed” and harmonious interoperability, along with operational mandates for continually integrating legacy applications and devices with new software and hardware.

On all fronts, SOA environments are moving to the foreground of many leading retailers' strategic thinking in general and IT development planning in particular. Are you ready to move to the forefront as well?

Editor's note: Keith McNamara is senior vice president, software operations, at Fujitsu Transaction Solutions Inc.

¹RETAIL SYSTEMS ALERT GROUP. “SERVICES ORIENTED ARCHITECTURE BENCHMARK STUDY,” 2006-2007

²AMR RESEARCH. “A FRAMEWORK APPROACH TO SOA,” DENNIS GAUGHAN, APRIL, 26, 2006

wireless mesh local area network (LAN) formed of radio-enabled displays; the intelligent supervisory access (ISA) node that acts as a gateway between the existing pricing system and the mesh wireless LAN; and a sign management system.

Display

eSigns distributed throughout a store form the wireless eSignage system. eSigns are bistable, digital display screens affixed to merchandise racks and shelves, and are capable of displaying retail prices, sale prices or special offers.

The displays retain an image for prolonged periods of time without the need for power-consuming refreshing, and they exhibit excellent readability and contrast ratio, which enables visibility from any frontal or side position.

Sign Management System

The sign management system, located in the back-end of a store, keeps the retailer’s information systems and the ISA node continuously synchronized and integrates with the retailer’s existing pricing system to retrieve and acknowledge pricing data.

That data is sent via an Ethernet connection to the ISA node, which distributes the data to the eSigns. A database server stores network health information and the price information displayed by the eSigns.

ISA node

The ISA node is the heart of the mesh network and acts as a gateway to the wireless mesh LAN and eSigns. It receives, logs and transmits all data traffic between the wireless mesh and the sign management system. A single ISA node can service up to 20,000 eSigns.

HOW IT WORKS

Some retailers, like department stores, change their merchandise pricing up to three times a day. With an eSignage system, these updates are conducted automatically on a retailer-defined schedule, eliminating the labor intensive and expensive tasks of printing and manually changing signs throughout the store. To optimize the battery life, the network “wakes up,” delivers the encrypted information from the server to the eSigns and then returns to a battery-saving sleep mode. On-demand updates are available as well, in case the retailer needs to change a sign at an unscheduled time.

The network’s mesh protocol lets it easily adapt to a store’s physical environment, so obstacles such as dividing walls, display shelves and pillars do not affect operations. Data is routed from eSign to eSign until it reaches the ISA node.

The system also quickly adapts to changes in the network, such as physical movement of an eSign, by swiftly adopting new routes. If an eSign leaves the network, units that previously routed data through that sign automatically call upon the next assigned eSign to continue information routing.

THE PAYBACK

eSignage systems are reshaping the way retailers deploy and use in-store signage. As the technology progresses, all signs point to eSigns to ensure swift ROI for retailers by eliminating price discrepancies, increasing automation and labor productivity and enacting proactive merchandising.

Editor’s note: Robert Assimiti is executive staff engineer at Nivis LLC, a developer of technology solutions that wirelessly monitor and control remote objects.

Two solutions are offered for authentication: either the customer signs a transaction receipt, or types a pass code on the cell phone’s keyboard. Either way, the cell phone replicates the same functionality as an ATM chip and a payment terminal: identification and authentication.

Cell phone NFC has also been expanded to several other applications. In Germany and Taiwan, cell phones are used to pay for public transportation, and in the Netherlands, football club fans use their cell phone to buy food, beverages and souvenirs.

MORE SECURE THAN BLUETOOTH

Even if NFC resembles RFID (by its operating mode) and *Bluetooth* (by the way it’s transmitted), NFC has a major advantage: proximity – and therefore precision – of the communication. An NFC chip can only communicate in a four-inch radius (maximum), whereas *Bluetooth*’s operating range reaches more than 30 feet. In other words, you must place your cell phone on an NFC receiver to start the flow of information. This creates a very secure environment and makes it difficult to send unsolicited advertisements.

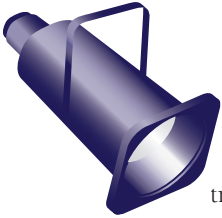
NFC has a second advantage. Since it’s compatible with RFID chips, customers could use their cell phones to obtain information from tagged products. Given the rapidly declining cost of RFID tags, this is a huge bonus for retailers. For the price of a couple of *Bluetooth* sites, you could get hundreds of RFID tags. Furthermore, RFID tags do not require a permanent power supply. They get their operating energy from the radio waves of the transmitter.

RAPID NFC ADOPTION: THE NEXT STEP?

Will NFC payment-by-phone become pervasive? It’s difficult to predict, because the challenges are similar to those facing every technology that implies a device evolution. But given the huge success of cell phones, the fact that consumers are embracing this new way of living, and the ascent of mobility as an industry enabler, we can reasonably think that this will happen very soon.

Editor’s note: Christophe Heurtevent is worldwide retail & hospitality marketing director at Microsoft.





SPOTLIGHT: SELF-CHECKOUT

CHECKING INTO NON-GROCERY RETAIL FORMATS *By Paul Burel*

As the lines between retail formats and industries become increasingly blurred, there's an opportunity to implement much more homogenous retail technology solutions. Self-checkout is a case in point: significant advances in software, hardware and operational processes have essentially eliminated the barriers to entry for virtually any retail format. New retail formats beyond grocery are learning and adapting, and customers are coming to expect self-checkout options wherever they shop.

As a result, the technology is now an attractive front-end foundational element for many progressive and innovative retailers, including drug stores, dollar stores and convenience stores, to name a few.

Prior to 2001, retailers outside of the grocery industry were skeptical about self-checkout. Would it deliver results? Would it handle large items, bulk orders or merchandise with

electronic article surveillance (EAS) tags? Could it process complex transactions?

Today, many of the leading non-grocery retailers ranging from mass merchandise discounters to do-it-yourself home centers have already been successfully using self-checkout. Those retailers witnessed up to a 40 percent reduction in wait times across all checkout lines and up to 10 percent improvement in labor productivity.

Between 2003 and 2006, after much testing and billions of transactions, these same non-grocery retailers, with their service providers, evolved self-checkout into a robust, hardened solution ready for every industry and segment.

Recent advances have made the technology more appealing for the non-grocery retailer, including:

- Improved security tag deactivation technology is embedded inside the scanners to reduce unnecessary exit door alarms after checkout.

- Standard deviation-based algorithms that reduce unnecessary weight security violations to a point where they are no longer a concern in most retail segments.
- Hand-held technology that scans large, heavy items and extends the self-checkout service offering to line-busting and queue management and monitoring.

Many more self-checkout advancements are yet to come. Various top-line sales features such as extended service plan prompting, online ticketing services and customer loyalty system integration soon will be available.

With so much focus and progress in self-checkout over the past few years, the technology has become a very powerful competitive advantage for retailers beyond the grocery arena and prospects are bright for its continued growth and adoption.

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