

# Retail Automation **BULLETIN**

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## **Self-checkout to drive growth in EPOS spending**

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Driving innovation at the checkout

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Consumer advocacy and POS technology

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Self-checkout: the global growth story

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Measuring the transformed customer experience

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The demand for green EPOS in Brazil

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Published by Retail Banking Research

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## Retail Automation

## BULLETIN



## Welcome to Retail Automation Bulletin

We would like to welcome you all to the first edition of RBR's new publication, *Retail Automation Bulletin*. For many years there has been a distinct lack of detailed analysis of

automation in the retail and hospitality sectors, so after nearly three decades specialising in banking automation, we have turned our attention to bringing the same rigorous, analytical and high quality approach to research and consulting in the retail automation sector.

We offer not only this journal, which we hope will interest suppliers and retailers alike, but also a detailed annual analysis of the global electronic point-of-sale (EPOS) and self-checkout (SCO) market.

This first issue of *Retail Automation Bulletin* contains a summary of our research into the global EPOS market, as well as articles from many of the industry's leading suppliers. These expert perspectives address many of the latest industry trends, such as self-checkout, concerns, such as how to tackle environmental issues, and keys to success, such as understanding the role of EPOS in improving customer service.

With retail automation technology improving apace, EPOS is rapidly becoming the new benchmark for the industry as retailers leave their old ECRs behind. In addition, the SCO market is now gathering considerable momentum, and is clearly a segment to watch over the next few years.

We hope that you enjoy reading the first issue of *Retail Automation Bulletin*. We would also welcome any suggestions about topics that you would like to see covered in the future. If you would like to receive complimentary future issues, please email your contact details to [retail@rbrlondon.com](mailto:retail@rbrlondon.com).

Dominic Hirsch, Editor

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ISSN 1748-5304



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**MARKET INTELLIGENCE**

# Self-checkout to drive growth in EPOS hardware spending

Point-of-sale (POS) hardware technology has evolved dramatically over the last few decades. Preferences, however, continue to vary widely between markets: some remain dominated by basic electronic cash registers (ECRs), while others – particularly in western Europe and North America – have largely migrated to modern programmable electronic point-of-sale (EPOS) terminals. In between these two solutions are a range of other products, which include sophisticated ECRs that can be networked but offer only limited programmability via firmware.

One recent development in the market has been the emergence of PC & cash drawer systems, which take advantage of the move towards mainstream operating systems, but which offer a lower initial purchase price by building solutions around regular – rather than retail-hardened – PCs. They present retailers, particularly smaller chains and independents, a way to gain some of the benefits of programmable EPOS but with a lower upfront investment – although debate will no doubt continue as to whether they present a lower total cost of ownership.

**1.6 million programmable EPOS units were shipped worldwide in 2007, a 6% increase on the previous year**

## **Global EPOS market totalled 8.5 million installations in 2007**

During 2008, Retail Banking Research (RBR) carried out a major study of the global retail point-of-sale hardware market, comprising extensive primary and secondary research. The study showed that the number of programmable EPOS terminals installed around the world had reached 8.5 million by the end of 2007, up 8% on the previous year. The three dominant regions were North America with 39% of these machines, western Europe with 27% and Asia-Pacific with 23%.

The market for programmable EPOS terminals remains relatively small in Latin America, central & eastern Europe (CEE) and the Middle East & Africa (MEA), accounting for 5%, 4% and 2% of global installations respectively. This reflects the more limited development of retail IT infrastructure in these regions, which is in part due to the fragmentation of the retail and hospitality industries. Large chains are typically the first adopters of more advanced point-of-sale technology. The growing presence of major foreign players can be expected to drive overall adoption rates, as local companies are forced to improve their systems to compete with new entrants.

## **Worldwide shipments up 6% in 2007**

In terms of shipments, a total of 1.6 million programmable EPOS units were delivered worldwide in 2007, up 6% on the previous year. Three regions accounted for 87% of these shipments. North America was the largest with 562,000 shipments, followed by western Europe with 432,000 and Asia-Pacific with 401,000.

At a country level, the ten largest markets for programmable EPOS shipments in 2007 comprised Canada, China, Japan, Russia, the USA and the 'big five' western European countries.

## **Definition of POS devices**

*Electronic Point-of-Sale (EPOS) unit* – a device which processes transaction data at the point of sale.

*Programmable EPOS unit* – an EPOS device that is:

- Fully user-programmable, running an operating system and dedicated EPOS application rather than programmability being firmware-based, as is the case with sophisticated Electronic Cash Registers (SECRs)
- Designed to be stationary (because of peripherals, cabling, weight etc.)
- Designed with retail/hospitality (etc.) users in mind with regards to reliability, lifespan, product availability and spare part supply, power consumption, environmental challenges (dust/grease/heat resistance), connectivity etc.
- Employee-operated

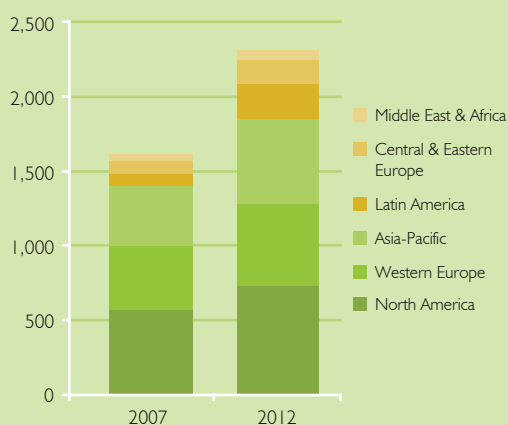
*Self-Checkout (SCO) unit* – shares the first three characteristics of a programmable EPOS unit, but allows customers to handle the payment and/or bagging/scanning components of the checkout processes themselves, instead of being served by a member of staff.

These countries collectively accounted for 74% of the total number of shipments worldwide. The USA received the largest number of shipments – three times more than Japan in second place. Shipment activity in the latter is expected to stagnate over the next five years, however, while unit sales to China are forecast to rise by more than 70%, which would see it overtaking Japan as the second largest recipient of shipments.

By 2012, RBR estimates that global programmable EPOS terminal shipments will reach 2.3 million, up 44% on 2007. In Asia-Pacific, shipments will increase by 42% over the five years to 2012, while western Europe and North America are forecast to grow at 30% and 26% respectively over the same period. In contrast, shipment activity will approximately double in MEA and CEE, with growth rates of 87% and 99% respectively by 2012; Latin America is expected to see the most rapid rise of all, with an increase of 167%.

### Programmable EPOS shipments

By region, in thousands



Source: RBR analysis

### New customer segments to drive growth

RBR's research defines four key customer segments for point-of-sale (or point-of-service) technology: food/non-food, general merchandise, hospitality and other (see textbox).

In 2007, the food/non-food sector accounted for 26% of the global installed base of programmable EPOS units, general merchandise retailers for 36%, hospitality for 19% and other businesses for 19%.

Shipment quantities to these sectors were more or less evenly distributed in 2007. RBR estimates that by 2012, the number of shipments

### Definition of key customer segments

- The 'food/non-food' sector comprises all stores for which food is the primary product sold, irrespective of whether or not those outlets also sell non-food products. This category includes outlets of all sizes, from hypermarkets with 50 checkout lanes down to convenience stores with just one.
- The 'general merchandise' sector includes multi-category retailers for whom food is not the primary product, such as department stores, mass merchandisers and variety stores. It also covers speciality chains for fashion, electronics, DIY etc.
- The 'hospitality' industry comprises locations that serve food (restaurants, fast food outlets etc.), drinks (pubs, bars and cafés) or provide accommodation (hotels, guest houses, etc.).
- 'Other' EPOS users include petrol stations (and other motoring/travel outlets), post offices, and any retail/services businesses not included in the previous categories.

in the food/non-food, general merchandise and hospitality segments will grow by 37%, 38% and 32% respectively. In contrast, the 'other' segment is forecast to see growth of 73%, as in many countries, penetration of programmable EPOS terminals in the sub-segments of this category – such as post offices and 'services' like doctors' surgeries – is lower today than it is in the retail and hospitality sectors. The growth rate is thus expected to rise as these sub-sectors catch up.

### Self-checkout market to triple by 2011

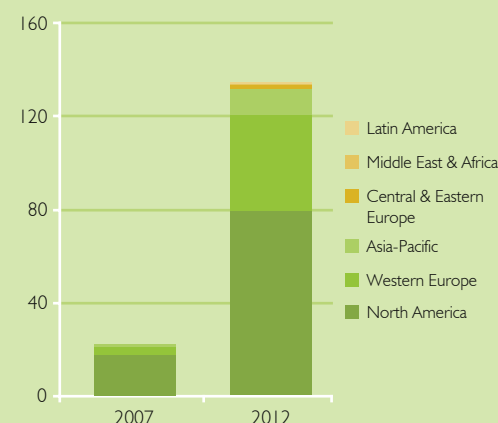
The last decade has seen the retail industry, and particularly the food/non-food business, embrace the ethos of self-service at the point-of-sale. Many of the world's top retailers, including Wal-Mart, Carrefour and Tesco, have started to roll out self-checkout (SCO) terminals in selected markets.

But while programmable EPOS has reached significant levels of penetration, particularly in North America and western Europe, SCO remains a niche product in all but a handful of countries.

**By 2012, RBR estimates that global programmable EPOS terminal shipments will reach 2.3 million, up 44% on 2007**

### Self-checkout terminal shipments

By region, in thousands



Source: RBR analysis

- RBR's research revealed that in 2007, a total of 21,800 SCO units were sold globally, up 34% from 2006. North America remains by far the largest recipient of shipments, with 17,400 units, or 80% of the total. Western Europe received 3,300 units (15%) and Asia-Pacific just under 1,000 (4%). The three other world regions together accounted for just 1% of total shipments.

By the end of 2007, a total of 70,000 SCO units were installed worldwide, an increase of 35% on the previous year.

Unsurprisingly, North America also dominates the world SCO market in terms of installed base, the 59,000 units installed there at the end of 2007 representing 84% of the global total. Western Europe was home to 9,000 machines and Asia-Pacific 2,000, while the other regions contained a total of fewer than 500 machines.

The SCO installed base is forecast to triple to reach 282,000 by 2011. North America will still account for more than two thirds (68%) of this figure, with western Europe representing 24% and Asia-Pacific 6% of SCO installations. Adoption of SCO technology in other regions is expected to remain significantly lower, with these regions together forecast to account for only 2% of terminals.

#### Self-checkout drives POS hardware spending growth

According to RBR estimates, global expenditure on programmable EPOS and SCO hardware and maintenance is expected to rise by 6.3% per year between 2007 and 2011.

Key drivers of growth in expenditure are increases in the number of shipments (driving hardware revenue) and the installed base (driving maintenance revenue). The initial hardware purchase, together with ongoing maintenance fees, represents the majority of hardware-related spending for retailers.

Another key driver is the end-user cost of hardware and maintenance. With fierce competition and a difficult economic environment in most countries, there will be pressure for price reductions. Although there is pricing pressure on SCO equipment, over the coming years the mix of SCO shipments is expected to move towards more advanced – and expensive – recycling units, meaning that the average price is expected to remain fairly stable.

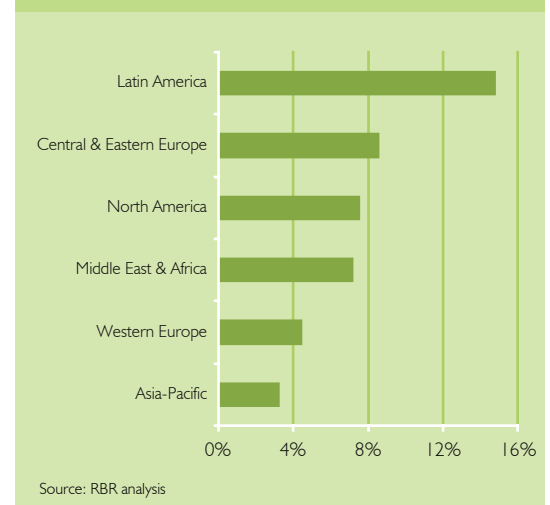
**The inclusion of SCO technology spending in the programmable EPOS expenditure calculations has a marked impact on CAGR projections**

**Latin America is expected to witness the fastest growth in spending, with Asia-Pacific and western Europe forecast to see the smallest increases**

The inclusion of SCO technology spending in the programmable EPOS expenditure calculations has a marked impact on CAGR projections – the SCO product segment witnesses exponential growth in shipments, and the unit price is far higher than for programmable EPOS.

Latin America is expected to witness the fastest growth in spending, with Asia-Pacific and western Europe forecast to see the smallest increases.

#### Hardware and maintenance spend CAGRs by region, 2007-2011



#### Changes are in store for retailers and consumers

RBR's 2008 research into retail automation hardware highlighted a number of key trends for retailers. One of the most significant is the rise of self-service, through SCO technology and alternatives such as mobile self-scanning, which will have a major impact on consumers' shopping experiences in the coming years.

Another key trend was the continued proliferation of conventional employee-assisted POS solutions, with PC & cash drawer solutions in particular likely to grow in popularity. Global PC companies like HP and Dell, who have built up significant shares of this market, are also narrowing the gap between such solutions and traditional programmable EPOS by carrying out a greater amount of customisation for the retail environment. ■

*This article draws from detailed research conducted by RBR into the global retail automation market. For information about RBR's latest EPOS research, please email [retail@rbrlondon.com](mailto:retail@rbrlondon.com).*

**SELF-CHECKOUT**

# Driving innovation at checkout

By Lothar Wolf, Wincor Nixdorf

## Delhaize at forefront of retail innovation

Over the next two or three years, Belgian food retailer Delhaize plans to equip more than two thirds of its 136 supermarkets with self-checkout systems. The size and extent of these deployments will be based on local requirements, with Wincor Nixdorf employed as Delhaize's technology partner.

Delhaize has been at the forefront of almost every new wave of retail sector innovation. The company was among the first to establish a real chain of stores. In 1860, company founder and former professor Jules Delhaize came up with the idea of establishing a "retail company with numerous outlets". Shortly afterwards, he opened his first store in Charleroi, Belgium and the company expanded rapidly. Another example of this pioneering spirit dates to 1957, when he opened Europe's first self-service supermarket in Ixelles, Belgium.

Delhaize was also a pioneer in the European deployment of automated checkout systems, which allow customers to scan their own products. Since the first trial more than a decade ago, the group has equipped 76 of its 136 Belgium-based supermarkets with self-scanners. "Within the next two to three years, self-scanning systems will be available at around two thirds of our stores", says Tom Engelen, Director of Retail Improvement and Store Communication.

## Retail self-service trio: self-scan, self-pay and quick scan

Mobile self-scanning is not the only form of retail self-service that Delhaize has implemented. For example, 'quick scan' and 'self-pay' come as optional extras on the back of the self-scanning technology.



**Self-scan:** Shoppers at Delhaize supermarkets have access to wireless scanners – the only prerequisite for usage being that they hold a Delhaize 'plus' storecard (the card's barcode is needed to access the device). As more than 80% of Delhaize customers are 'plus' cardholders, the service is available to the majority of shoppers.

Customers simply scan the barcode on their 'plus' card at a device station to receive a mobile scanner, which they can then use to scan their chosen items as they shop. The devices are easy to use – each scanner has a small coloured display which shows various pieces of information, such as product name, price and total number of items scanned.

**Self-pay:** Having scanned their products with mobile (or stationary) devices, customers at most Delhaize stores tend to pay in the conventional way. In a move to encourage self-payment, however, the company has installed some Wincor Nixdorf Pay Tower 100's at 10 supermarkets. "The initial response to the terminals was poor, largely because they were unable to accept all the many types of coupons in use in Belgium," Engelen explains. "But the terminals now account for a quarter of all transactions."

**Quick Scan:** In 17 Delhaize stores, customers can now scan their chosen items not with a mobile device but rather at a stationary terminal. Customers with 10 or fewer products have access to Wincor Nixdorf Self Scan & Bag terminals. These terminals are heavily used by workers on their lunch break when they are pressed for time, or after work. Such customers account for approximately a quarter of all transactions. ►



Lothar Wolf  
Wincor Nixdorf

### Delhaize Group:

- International food retailer – established in 1867 and publicly listed in Brussels and New York.
- More than 150,000 employees and over 2,500 stores in three continents.
- More than 1,500 stores in 16 states in the USA (Food Lion, Bloom, Bottom Dollar, Harveys, Hannaford Bros. and Sweetbay); 201 stores in Greece (Alfa Beta Vassilopoulos); 63 outlets in Indonesia (Super Indo); 40 supermarkets in Romania (Mega Image) as well as stores in Belgium, Germany and Luxembourg.
- In its home market of Belgium, Delhaize has 775 stores and employs 17,000 people. 136 of the 775 stores are supermarkets, 230 are neighbourhood stores (Proxy Delhaize, City Delhaize and Shop 'n Go) and 117 are pet food shops (Tom & Co).
- Mission: "Delhaize strives to predict customer demands and develop the consumer markets of tomorrow. We offer our customers the best quality at fair prices, in addition to an innovative range of foreign specialties and delicatessens. We pay particular attention to the freshness and quality of produce and a wide assortment".



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► **Attracting customers to self-service**

Depending on the size of the Delhaize store and the amount of customer traffic, at least three of the nine to thirteen checkout points are reserved especially for mobile or stationary scanning. “We adhere to this number even if the self-scanning lanes are empty and the cashier lanes have queues,” Engelen points out. “We want to drive home the point that self-scanning can be a very fast and efficient way to get through the checkout process.”

Self-scanning accounts for around 25% of total sales in those stores which are equipped with the technology. Depending on the location, this level can range from 15% to as much as 40%. At this level, Delhaize can achieve significant cost savings. “Investment in self-scanning systems can pay for itself

within two years,” Engelen says. “With the Scan & Bag terminals, it can take a bit longer.” Interestingly, Delhaize has not been able to identify the particular type of customer who favours self-scanning; the system is used by customers of all age groups, backgrounds and levels of education.

“What is important,” Engelen emphasises, “is to clear the first hurdle. Then customers will trust the new service and quickly become fans of self-scanning”.

From the outset, Wincor Nixdorf has helped Delhaize with the development of its self-scanning concept as well as its implementation. The checkout lanes at the Belgian stores are equipped with Wincor Nixdorf Beetle M111 POS systems, payment devices and Scan & Bag terminals, while its partner Datalogic supplies the mobile scanners. Wincor Nixdorf is responsible for system implementation, and also provides a number of extra services, including the development of user manuals, training and local support. ■

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**Self-scanning accounts for around 25% of total sales in those stores which are equipped with the technology**

**In 2009, retail executives will care far more about customer demand than about any form of store technology**

## CONSUMER RESEARCH

# Consumer advocacy and POS technology

*By Leo Suarez, IBM Retail Store Solutions*

In 2009, retail executives will care far more about customer demand than about any form of store technology, according to a survey of 600 executives in North America and Europe conducted by the CIES Food Business Forum. IBM research also shows that retailers seeking to increase shopper advocacy and lure shifters away from their competition must focus on such elements as store experience, convenience, and pricing/promotion – all of which link directly to the capability and efficiency of the point-of-sale (POS) solution at the checkout, and the availability of other in-store self-service technologies. So, while retail executives may be less technology-focused than in 2008, POS technology, such as that provided by IBM Retail Store Solutions, can help them address these critical areas of concern.

### Shopper advocacy and consumer trust matter more than ever

The IBM Institute for Business Value (IBV), which provides senior business executives with strategic insights on today’s most pressing issues, conducted a survey of 30,000 US consumers in September and November of 2008. The goal was to understand what drives consumer spending across several product categories: grocery, apparel, home merchandise, and pharmacy, health & beauty care. The survey revealed that consumers, anxious due to economic conditions, rely on retailers they trust – a finding that led to the identification of two valuable segments: ‘Advocates’ of existing retailers and ‘Shifters’ seeking new relationships. IBV believes that retailers

that execute on the requisite strategies to attract and retain these shoppers will emerge as winners.

### Consumers have fundamentally changed their shopping behaviour

Market conditions have forced consumers to make trade-offs and alter spending habits. In the IBV survey, more than a half of all consumers stated they have less discretionary spending than last year, causing them to buy fewer items or delay purchases, buy more promoted items or change to lower priced products. The IBV survey also revealed that on average, consumers will change allegiances to a particular retailer after an average of 3.1 negative experiences.

### 'Advocates' have grown in influence

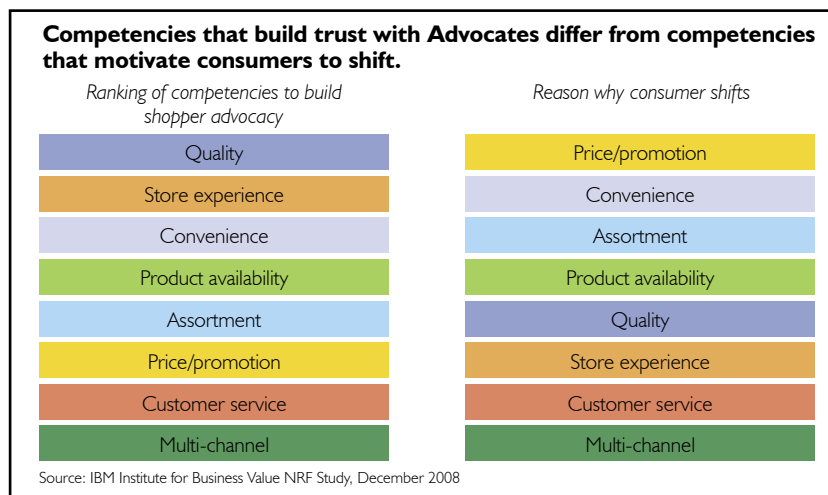
Advocacy is the positive attitude customers have toward their primary retailer, which in turn promotes healthy relationships, trust, loyalty and referrals. Today's consumers rely on retailers they trust – and their influence has grown substantially. Advocates have a dramatically positive impact, because consumers are more connected than ever, and able to share thoughts and experiences in real-time. Advocates also create far more value than other consumer segments. They spend on average 10% more per month, 6% more during each shopping trip, and 15% more of their income at their primary retailer than the 'Antagonist' segment – consumers with a negative attitude toward their primary retailer.

### Valuable 'Shifters' are motivated to seek new relationships

Shifters – shoppers who move their purchases from one retailer to another – are also an attractive segment. Nearly a third of consumers are either buying more from alternative retailers or abandoning their current retailers. IBV research showed that these consumers scrutinise every purchase, are willing to make trade-offs to acquire non-essential merchandise, and will travel to more stores to find bargains and trusted retailers. Although Shifters state that they are prompted to change retailers mostly on the basis of price, they ultimately spend more once they become loyal shoppers – per month and per shopping trip. And of the 11% of consumers who abandoned their primary retailer, four out of every ten quickly became an advocate for their new retailer.

### Eight pillars for building trust

IBV research found key attributes (see diagram) that consumers value in the trust equation: assortment,



convenience, customer service, multi-channel, price/promotion, product availability, quality and store experience. Retailer success requires building competencies in these eight operational 'pillars' – prioritised based on product category, financial health, market outlook, customer expectations and business strategy. Shoppers indicated that these pillars were important operational attributes, regardless of shopping style or consumer segment.

The top attributes that appeal to Advocates are quality, store experience and convenience. Shifters are primarily motivated by price/promotion and convenience. While focusing on these areas independently is a step forward, effectively executing the desired operations in a holistic fashion across all eight pillars can help ensure that retailers accurately and rapidly sense and fulfil consumer expectations at each point of interaction.

### What can POS do to help create Advocates?

A recent Wharton study showed that efficiency in the checkout process has a measurable influence on same-store sales as satisfied customers are more likely to return than dissatisfied ones. During checkout, seconds matter because customers demand speed and control. Drivers of improved checkout efficiency include:

- Reliable, remotely-managed and retail-hardened POS hardware experiencing less downtime;
- Rock solid POS application optimised for the specific retailer and offering extensions for loyalty, multi-channel and workforce management;
- Store front-end offering multiple options for faster, more accurate checkouts (cashier-attended, self-checkout, line-busting).

IBM Retail Store solutions align squarely with these

**Consumers are now forced to make trade-offs and alter spending habits. Over half of consumers state they have less discretionary spending than last year**



- drivers. They include the retail-hardened SurePOS point-of-sale portfolio, which now includes its exclusive RMA remote systems management, virtually toolless access to critical components, and light-path diagnostics on new systems; the high volume ACE application featuring simple partner extensions via its Store Integration Framework (SIF); and a range of self-checkout solutions and the industry leading SureMark printers.

### Beyond the traditional POS

The customer's demand for efficiency extends well beyond the traditional checkout at POS to all points-of-service in the store, particularly in the grocery sector. While grocers have long offered points-of-sale and service in the deli, pharmacy and floral departments, they are increasingly offering additional purchase opportunities: branded in-store coffee stands; health drink and juice bars; and in-store sit-down dining. Each of these points-of-sale requires integration into the retailer's POS application, as well as loyalty and promotions applications.

In some cases, retailers may opt to use 'screen-scraping' as a quick fix to extend their POS application to a self-service kiosk or touch screen POS at an in-store coffee stand. Unfortunately, changes in the POS application often lead to additional costs – making changes to the kiosk or touch-screen – or worse, to downtime for employee- and customer-facing technology. IBM's Store Integrator GUI (SI GUI) offers a better solution, providing a Java-based interface that is truly linked to the underlying application while giving employees and customers an attractive and intuitive interface. In addition, IBM's Electronic Marketing assets will make sure a customer's loyalty and spending data are updated in real time, so that a customer making multiple purchases throughout the store in a single visit – someone who is probably an Advocate – will be rewarded, not frustrated.

### Labour savings versus customer experience – or TCO versus ROI

In today's challenging economic climate, most retailers are looking at all possible ways to reduce

spending, including capital expenditure and labour costs. Recent efforts to drive the adoption of green technology have been instrumental in this cost reduction, as environmentally positive outcomes like lower power consumption and reduced usage of consumables (such as receipt paper) have also driven bottom line savings. Through product longevity, deep sleep capabilities on POS hardware, fanless processors and high efficiency printers, IBM Retail Store Solutions has helped its clients reduce their total cost of ownership (TCO) for their POS solutions.

IBM also believes, however, that TCO is not the be all and end all for its clients. In some cases, instead of merely reducing in-store labour costs, a client might choose to redeploy that labour to enhance customer service. A recent Wharton study of a major US retailer showed that over a 17 month period:

- 24% of customers making a purchase could not find at least one item
- 15% could not find item price information
- 14% could not locate store personnel to assist them.

The study estimated that redeploying \$1 of store labour could drive anywhere from \$4 to \$28 in incremental sales, a potentially much larger boost to the bottom line and ROI than reducing labour costs.

The Wharton study also reached a conclusion similar to that of the IBV research cited above: the most important driver of same-store sales is customer experience. As well as improving the bottom line, redeploying store labour can help retain the most profitable customers – the Advocates, while keeping Shifters loyal and attracting new custom.

### Conclusion

In brief, retailers seeking to increase shopper advocacy and lure Shifters must focus on such elements as store experience, convenience and pricing/promotion. The point-of-sale is a critical location for executing on these elements in a customer friendly, value enhancing manner. IBM's Retail Store Solutions can help. ■

*Leo Suarez is Vice President of Marketing & Strategy for IBM Retail Store Solutions. To learn more about IBM POS Solutions and Retail Thought Leadership visit [www.ibm.com/retail](http://www.ibm.com/retail). To obtain more information or request a full version of the Shopper Advocacy paper, please email [iibv@us.ibm.com](mailto:iibv@us.ibm.com). This article is copyright IBM Corporation 2009.*

**Efficiency in the checkout process has a measurable influence on same-store sales as, during checkout, seconds matter because customers demand speed and control**

**Redeploying \$1 of store labour could drive anywhere from \$4 to \$28 in incremental sales, a potentially much larger boost to the bottom line and ROI than reducing labour cost**

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"Retail store execution: An empirical study," Fisher, Krishnan, and Netessine, The Wharton School, University of Pennsylvania, December 2006.

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**SELF-CHECKOUT**

# Self-checkout: the global growth story

By Michael Webster, NCR

## Self-checkout popular with both retailers and customers

Retailers and consumers continue to embrace self-checkout – the technology that enables shoppers to scan, pack and pay for goods themselves – which was first introduced over twenty years ago. Shoppers of all ages feel comfortable with the technology, which they use to purchase goods ranging from food and clothes to pet supplies and electronics. They perceive self-checkout terminals to offer faster service and create shorter queues – important service priorities in view of our increasingly busy lifestyles and congested towns and cities.

Research has revealed a clear trend amongst consumers on a global basis towards top-up shopping. For example, the average Briton passes a supermarket at least once during a typical day and shops for groceries three or more times a week. Shoppers are buying more fresh food as they would like to avoid waste. They want to be able to 'grab, pay and go' and many feel that checking out the goods themselves is the best means of doing this.

Users of self-checkout are actively engaged in scanning their goods and report that they perceive time to pass more quickly – an experience known as 'wait warping'. In addition, budget shoppers like to see prices on-screen, reassuring them that discounts are being correctly registered. Other shoppers cite privacy as a reason for using the technology.

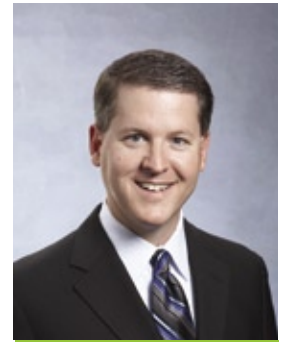
For retailers, there are compelling business reasons for deploying self-checkout terminals. For example, they more than double the number of tills that can be made available within the same space as an assisted-service checkout. Self-checkout terminals also enable retailers to operate more cost-effectively. For example, as one attendant typically oversees four or more self-checkout terminals, employees can be redeployed to improve customer service elsewhere in the store. This includes improving on-shelf availability, fulfilling online orders, receiving returns or

helping shoppers locate items.

Self-checkout terminals are also useful in addressing the challenge of staffing during peak times, late at night and early in the morning. For many retailers it is simply uneconomical to hire extra staff to cover a two-hour lunchtime shift in busy city-centre stores, or to staff outlets fully around the clock.

Consumers have an increasingly wide choice of outlets offering 'grab and go' lunchtime food items and a quick, queue-free checkout service is important to stop people walking away to the competition. We are also increasingly shopping at what were previously thought to be unusual hours. Around 14% of the UK's working population are shift workers (i.e. they work outside of 07:00-19:00) and the figure is comparable in the USA. Self-checkout terminals can readily accommodate fluctuating consumer demand around the clock.

There is also increasing demand for self-checkout terminals which offer shoppers a choice of two or more languages – especially from retailers in areas that are popular with tourists or have high concentrations of immigrants. Some self-checkout terminals can be equipped to 'speak' many different languages. For example, languages currently deployed on NCR self-checkout terminals include Danish, Dutch, English, U.S. English, Finnish, French, Canadian French, German, Italian, Japanese, Korean, Lithuanian, Polish, Spanish, U.S. Spanish, Swedish, Turkish and Welsh.



Michael Webster  
NCR

**Users of self-checkout are actively engaged in scanning their goods and report that they perceive time to pass more quickly – an experience known as 'wait warping'**



- It is for these reasons that self-checkout terminals are spreading to ever more countries. Additionally, those retailers which have already deployed self-checkout terminals are making an increasing number of them available in each store. In the best performing stores in the UK where self-checkout terminals are deployed, up to 40% of the volume of transactions is executed through self-service.

### **Understanding consumer behaviour and driving technical innovation**

More than 125 retailers in over 20 countries are using NCR SelfServ Checkout terminals, including major names such as Tesco, Sainsbury's and Marks & Spencer in the UK; the Casino Group in France; Alcampo and FNAC in Spain; and the METRO Group in Germany.

The keys to this adoption have been NCR's technical innovation and its consultative approach to analysing consumer behaviour and retailers' store operations to help customers deploy the technology in a way that will drive usage. NCR has a 'Customer Experience Consulting' team comprising psychologists, ergonomists, statisticians, industrial engineers and designers, user interface and graphic designers, as well as IT and business consultants. They undertake a variety of research programmes, including video-based time and motion studies of consumers and staff using retail checkout terminals to identify ways in which vital seconds can be shaved off each element of a transaction. This research has led to continuous enhancements to self-service checkout over the past ten years.

One result of this research is the extent to which the company's self-checkout software offers 'multipathing' – allowing shoppers to conduct transactions in the way that seems most logical to them. For example, shoppers can click the 'start' button to start a transaction or they can simply begin scanning without touching the screen.

In addition, newer versions of the technology enable shoppers to insert loose change in bulk into the machine as payment rather than feeding in individual coins. Cash inputs/outputs are arranged side by side, while 'follow-me' lighting guides consumers through each step of the payment process, complemented by audio and on-screen prompts.

The solution now also features NCR's own advanced scanner technology, which creates a scan pattern that is denser than comparable competing scanners

currently on the market. This reduces the need for users to orientate merchandise packages precisely while scanning. It creates a scan pattern designed to capture and read all bar codes, and features software to decode even small and truncated bar codes which are difficult to read.

Moreover, a variety of features support retailers' commitment to the environment. Two-sided thermal receipt printing is now standard, for example. This technology prints on both sides of the receipt paper simultaneously, reducing paper consumption by up to 40% as well as speeding up print times. The company has also switched to energy-saving compact fluorescent light bulbs and the solution supports reusable 'green' bags by allowing shoppers to place their own bags in the bagging area without setting off an alert.

### **Consultants help optimise investment**

NCR consultants play an important role in helping retailers maximise the value of their self-checkout investment. Prior to deployment, they can evaluate the basket size and mix at each of the existing checkouts within the store. They are then able to recommend the optimum number of self-checkout terminals for that store, where the units should be located in relation to the main bank of tills and how they should be configured to optimise store throughput and customer satisfaction.

In many countries, a high proportion of shoppers have relatively small baskets of a dozen or so items. By enabling these shoppers to use self-service, retailers free staff to assist shoppers with larger trolleys – for a more efficient service environment overall. As shoppers increasingly enjoy using self-checkout terminals, growing numbers of retailers are also installing units equipped with input and take-away belts for larger trolleys.

In the two decades since introducing its first self-checkout, NCR has invested significantly in researching and developing the technology. The company has 100 self-checkout patents granted or pending, and countless more for self-service solutions in the financial, travel and healthcare sectors. For these reasons, NCR SelfServ Checkout continues to be one of the most popular self-checkout product lines in the world. ■

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**Those retailers which have already deployed self-checkout terminals are making an increasing number of them available in each store**

**NCR's self-checkout software offers 'multipathing' – allowing shoppers to conduct transactions in the way that seems most logical to them**

**CUSTOMER EXPERIENCE IN SELF-SERVICE**

# Measuring the transformed customer experience

By Andy Taylor, Fujitsu

**Developing a customer experience strategy**

Customers' shopping behaviours and expectations of their retail experience vary by shopping occasion, by channel and over time. This makes it difficult for retailers to target the appropriate elements of customer experience to be delivered to a specific customer at a specific moment. Research conducted by Fujitsu indicates that retailers need to keep in mind the consumer's perceptions of what makes an ideal experience: right pace of service, right value, tailored offerings, trusted relationship and ease of doing business. Without an integrated approach to 'experience design', it is easy to understand why many investments in technology-driven self-service solutions have not been successful.

There has also been a surprising lack of fact behind investments in self-service. Business cases are thin on the ground and rarely robust. The result is the implementation of partial solutions that do not live up to customer expectations, fail to deliver and are consigned to history by both customer and retail staff alike. We need to put more thought and control into the design and management of the in-store customer experience now that self-service is a practical alternative to traditional customer service.

For example, one area of self-service that has gained significant momentum is self-checkout. This has been around for a number of years and many leading grocery and non-food retailers have either deployed or are piloting it. With some notable exceptions, these investments have not delivered the expected benefits to shopper or retailer. The business case for self-checkout has been driven by expected labour savings and the ability to move payment transactions away from manned till lanes. Few retailers have offered it in a way that integrates well into the end-to-end shopping process – one that matches the consumers' expectations.

If it has proved difficult to integrate even self-checkout into the end-to-end experience, how will retailers understand the impacts of future enhanced self-service offerings? This is the next generation of interactive shopping processes and tools, which includes navigation kiosks, self-checkout tills, pay stations, mobile interactions and personal shopping assistants that link seamlessly with the online world. Most retailers had their first encounter with 'kiosks' long ago, but never translated it into an integral part of the shopping experience. Why? Because this was a classic case of technology trying to lead the business. Now the consumer has pulled ahead, the business is playing catch-up and the technology is at last sufficiently mature to allow the deployment of new, robust and process-integrated solutions.

**Designing an integrated self-service environment**

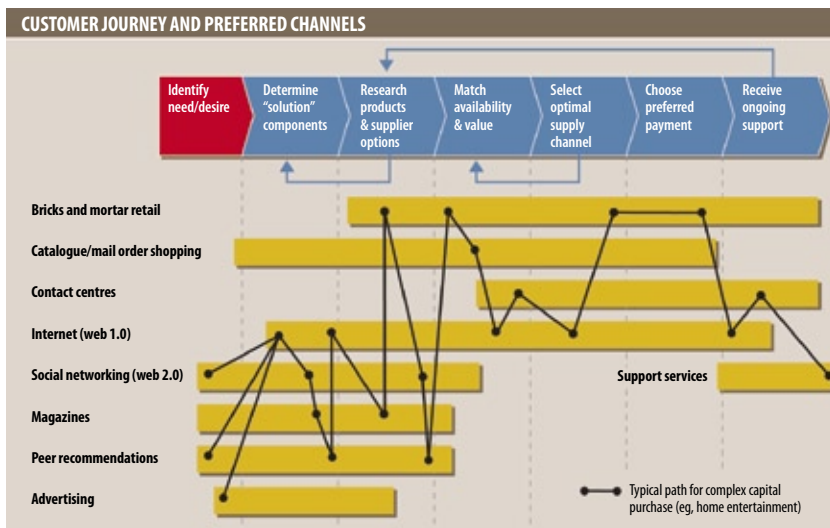
Once the elements of the customer experience strategy have been defined and agreed upon, they must be translated into the practical design of the individual self-service components. These components should then be deployed through carefully controlled pilots so that the organisation can understand the impact of each element on the customer. For each of these individual service components, new measures should be generated to monitor the impact and used to drive continuous improvement in the offer. Customer experience measurement should not be an afterthought – it is an integral part of the self-service concept and must be built in. There are several sophisticated shopper tracking and behaviour insight systems available in the marketplace. These can be used to automate many of the basic customer interactions and to provide both analytical insights and real-time alerts. Tracking the full customer experience means identifying individual customers as they move between different channels. How can we identify and connect the shopper browsing for products



Andy Taylor  
Fujitsu

**Customer experience measurement should not be an afterthought**





- ▶ by mobile phone with the same shopper using the in-store kiosk?

Asking customers to sign up for loyalty schemes that require them to key in passwords or swipe membership cards is one way of making the connection. But customers are increasingly averse to identifying themselves just for the convenience of the retailer's processes, or for promised future benefits. They will trade identification keys only for immediate benefits that contribute to the goal they are currently pursuing. This implies that future retail channels and stores will be designed more closely around consumer journeys and all of the associated process steps.

### Understanding the end-to-end customer journey and developing a holistic view of customers' experiences are the new challenges

It is not yet conceivable that a store will be configured to meet the needs of each consumer on every visit (although this is beginning to happen in pure online retailing). It is possible, though, to envisage more obvious zoning of offers to reflect typical shopping journeys. This might include a convenience store within a grocery store, which stocks the top convenience SKUs (stock keeping units) and trades 24/7. Self-service, multi-channel and customer experience design concepts may look good on paper, but industrialising them within established retail operations is difficult.

#### Making the connection

So what measures are important in the multi-channel world and how are these to be used to drive broader, deeper relationships with customers and hence improved profitability?

Unfortunately, there is no single answer to this question. It really depends on the nature of the relationship you want to have with the customer. If

you are focused on value-based habitual purchases then your multi-channel measurements might focus on direct conversion from one channel to another. For example, tracking the uptake of an internet offer that is redeemable in-store can be done both at the aggregate level (20% of customers who received an online voucher redeemed in-store) or at the insight level (unique references link each voucher back to the internet usage at that session – relating an in-store activity to an online behaviour).

On the other hand, if your offer is complex, high value and requires multiple touch points across the customer's purchase journey, then you will need to measure more attributes and understand how each of your channel offers fits within the whole. Here 'tagging' every contact and providing the hook that drives customers to want to identify themselves at each stage is critical.

#### Long live the revolution

Fujitsu's research into European shoppers' attitudes towards self-service across multiple channels shows that there are high expectations – and fears – around the introduction of self-service technologies as part of the everyday retail experience. Retailers are beginning to respond to their customers and develop new approaches that take the customer's supremacy into account. Understanding the end-to-end customer journey, building the experience 'tags' and measures, and developing a holistic view of their customers' experiences are the new challenges. It's only when these new service offers are deployed within a customer-driven shopping experience that the full benefits will be realised and the latest revolution in self-service will be complete.

Customers will continue to teach us how shopping meshes with their lives. They will continue to discover new needs and to press retailers for more choice, better quality, value for money and more enjoyable experiences. They will share their needs by granting retailers the right to identify them; but retailers will have to earn that right – and keep earning it. An integrated approach to self-service as part of the full customer experience, anchored in pervasive measurement, is the key to partnering effectively with today's empowered customers. ■

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**EPOS DESIGN**

# Style as well as functionality for next generation EPOS

By Graham Holland, Posiflex

## **The migration from ECR to EPOS is as much about design as functionality**

For decades, the earliest electronic point-of-sale (EPOS) market focused on electronic cash registers (ECRs) before the development of PC-based systems and terminals. But as EPOS became more popular and began to offer more value-added features, people started to expect EPOS design to change in style, functionality and to be environmentally friendly.

## **Green is the word**

Good environmental stewardship is now becoming a hot topic with manufacturers, distributors and end-users alike. It is no longer good enough to just use the term 'green', as it now has to be backed with action and proof of worth. With international recycling guidelines and green awareness, modern suppliers have no excuse to exclude Green EPOS product development. The 2007 WEEE Regulations (Waste Electrical and Electronic Equipment) went a long way in forcing the industry to realise its responsibilities and readdress any non-green practices.

One of the ways in which EPOS equipment can be rendered more environmentally friendly is to introduce extremely low power consumption, by incorporating fan-free technology in the production of the new generation of touch-screen terminals. The core technology of an EPOS system comprises energy economisation, CPU selection, heat-pipe positioning and component filtering – and these are the factors which differentiate Green EPOS from traditional EPOS.

Nowadays Intel, Microsoft and other key players are all dedicated to developing innovative technology for power saving, heat-dispersal and performance speeds, especially in multi-functional applications. For example, 'Intel-led' Intel Core 2 Duo 2.16GHz CPU chipsets for EPOS

applications will be standardised as a common controller for fan-free terminals, and this will enable more integrated operating systems that are 'processor-hungry'. Posiflex has controlled the dissipation of heat generated by larger, faster chipsets by developing the top-poised heat-pipe. This design feature guides the heat/airflow directly up and away from the back of the terminal, thus overcoming the challenges involved in overheating. This kind of design is consistent with the expectations of customers, who demand silent running and lower energy consumption as standard from their EPOS equipment, for significant cost savings and reliability.

## **Reliability, compatibility and durability are the fundamental elements of EPOS**

No matter how EPOS technology progresses, systems reliability, compatibility and durability are the three fundamental elements that differentiate good EPOS systems from bad.

The results of a recent survey showed that reliability was the number one requirement for EPOS customers. With a wide array of products and manufacturers in the market, many of the products today are not as reliable as they are purported to be. This could be a major problem if part-way through roll-out, one is forced to change product or supplier due to reliability issues. It is therefore advisable to research the chosen supplier thoroughly in this regard.

Furthermore, durability and longevity of EPOS systems are also main considerations in every buyer's mind, particularly for high-end EPOS systems. Most EPOS terminals are manufactured to withstand the harsh environmental conditions of the modern hospitality and retail position, and they are designed to cope with liquid spills, dust, splashes, humidity and wash-down.

Compatibility with components and software from ►



Graham Holland  
Posiflex International

**No matter how EPOS technology progresses, systems reliability, compatibility and durability are the three fundamental elements that differentiate good EPOS systems from bad**



**The art of EPOS design is to select the right hardware and software combination, whilst keeping an eye on functionality versus cost**

- ▶ different manufacturers is another key element customers prioritise in an EPOS solution. Due to the complexity of these systems, market-leading hardware manufacturers and software houses must forge partnerships with each other. Using the expertise of these companies to contribute to the overall hardware and software integration, and ultimately the overall user applications experience, gives that extra edge.

One area of key compatibility is between EPOS units and peripheral devices. When touch-screens and peripherals are completely integrated into the EPOS system, a stable hardware platform is needed to accommodate a flexible, open and dynamic structure in order for software to be displayed effectively. The modern EPOS terminal can be interfaced with an array of compatible peripherals, such as a thermal/impact printer, customer display, barcode reader and a keyboard.

Furthermore, each component of an EPOS system can be exchanged as easily as if it were a modular system made from separate elements, making maintenance very straightforward.

#### **The rising popularity of the secondary customer display**

A rising trend in the EPOS market is the adding-on of a secondary customer display. The main reason for the increase in popularity is the interest now shown in digital promotional signage, which is becoming a vital, interactive point of contact between the retailer and customer. The addition of an advertising portal offers the opportunity to up-sell and increase profits.

A secondary customer display also gives vendors and retailers an opportunity to present survey questions to consumers during the checkout

process. Consumers are more apt to use a touch-screen voluntarily than go through a question and answer session with a store employee. Vendors can obtain critical market information and customer feedback in real time.

In addition, it provides an opportunity to visually present incentive-prompting. This process creates an interactive checkout process and ensures consistency at the checkout station without the need for employees to memorise scripts.

#### **EPOS is designed to address industry-specific needs**

Compared to the PC industry, EPOS has developed a particularly versatile set of applications for different types of business: restaurants, shops, supermarkets, spas as well as hospitality. Investing in EPOS helps the retailer better control his ever-increasing operational complexities from the front to the back office. Whether the retailer is just looking to automate his order entry and cash/sale procedures, minimise employee mistakes, prevent cash drawer shortages or have better inventory control, EPOS can solve a variety of issues.

For example, a hair salon business would need its EPOS system to control inventory, schedule clients, obtain customer reports or recall the hair treatment of certain clients, and ensure appointments do not overlap. The art of EPOS design is to select the right hardware and software combination, whilst keeping an eye on functionality versus cost.

#### **Customers want stylish designs**

Besides functionality, the aforementioned survey also highlighted that a stylish and robust design is also required by EPOS customers. Large investments are often made in shop-fitting and the interior design of new outlets, so the installation of nondescript, old fashioned equipment, which is incongruous with the shop's image, is not desirable. It is a fact that computers and EPOS equipment are by their very nature functional, but it has become increasingly important to ensure that the styling is contemporary – with many end-user retail and hospitality outlets now looking for a specific colour or pattern design to fit their look. ■

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**EPOS IN BRAZIL**

# The demand for green EPOS in Brazil

By Carlos Mauricio Guizelli, Itaotec

## A change of direction: From boom to green

The past four years have been a boom period for the Brazilian IT industry, with IT vendors having seen exceptionally high sales volumes. Various factors were responsible for this, including tax cuts in several equipment areas, a beneficial exchange rate between the US dollar and the Brazilian real and a more stable economic environment. While the statistics show a sharp upward trend in all sales areas, over the past year the market has turned its attention in a different direction: towards green, environmentally friendly products. Brazilians are now asking questions about the way IT manufacturing, as well as the IT products, impact the environment, in particular in terms of energy consumption. This will dramatically change the way Brazilian IT companies run their businesses. In particular, it will have a profound effect on the decisions IT managers will need to make going forward.

Interest in this issue started with research conducted at local universities, which sought to measure the impact the IT industry was having on the environment – such as the carbon emissions of Brazil's big data centres. The researchers also sought to look at ways of minimising this impact whilst reducing operational costs. It was not a surprise to market onlookers that local businesses would subsequently attempt to build on such research, in particular Brazil's financial institutions and more recently, organisations linked to the retail sector.

## What does 'green IT' mean?

What does Brazilian industry consider to be a green IT product? For some companies it is simply a product that reduces energy consumption via the use of more efficient materials and components or more advanced energy management. In markets where energy resources are based on fossil fuels, such as the USA, the IT industry is still emitting high volumes of greenhouse gases. According

to the EIA (Energy Information Administration), which produces official energy statistics for the US government, fossil fuels supply 85% of all the primary energy consumed in the USA and are responsible for 98% of CO<sub>2</sub> emissions. In Brazil, where the majority of electricity is generated by dams, the impact of greenhouse gas emissions is less pronounced, although the idea of reducing energy consumption is still attractive to most Brazilian CEOs.

For other companies, 'green IT' means more than this. Such companies are interested in managing the lifecycle of their products, in particular trying to eliminate the use of hazardous component materials. There are yet others who are particularly interested in recycling equipment, like computers. Brazilian customers have related concerns such as who will run the recycling programmes and whether recycling of IT components will actually meet environmental regulations.

## Brazilian retailers demand green EPOS

Green issues have turned out to be of great importance in terms of governance and transparency, both for shareholders and customers. These issues are pushing the large and medium-sized retail chains to demand environmentally friendly products and services from their electronic point of sales (EPOS) suppliers. This extends to their service contracts, in which they demand sustainable processes.

But why such concern? In the past one would have said that such companies simply wanted to be seen as environmentally responsible organisations. But this is certainly not the case any more, so we have to draw the conclusion that they are demanding green products and services because their customers are demanding it of them. It also appears that more mature Brazilian companies, having been in the IT market for many years, are simply



Carlos Mauricio Guizelli  
Itaotec

**Green issues are of great importance in terms of governance and transparency, both for shareholders and customers**



**Consumers are so aware of Brazilian industry that they demand products and services which are designed and manufactured in an environmentally friendly way**

**Some people in the industry think that in two years' time all EPOS terminals sold in Brazil will be green, but this is overly optimistic**

- ▶ demanding it of themselves as the right thing to do. In today's computer-savvy society, you can find out what a company has done, or has failed to do, with just a few clicks of a mouse. Consumers, with their social networks and blogs, act like watchdogs, supervising every aspect of a retailer's behaviour. This is now also the case in Brazil where consumers are so aware of Brazilian industry that they demand not only products and services which are designed and manufactured in an environmentally friendly way, but also an environmentally committed attitude from the retail chains where they shop.

#### **Transformation to green IT is a big challenge**

When a company has a tightly organised infrastructure with efficient processes, is it possible for it to focus on improving its environmentally friendly status at the same time? This is more easily said than done, and such a shift in approach is an enormous challenge.

Itautec had to change its entire process of production, which took all of seven years. Right from the start, an entirely new department had to be created, which was to implement an environmentally friendly management system (ISO 14001). Its role was also to liaise and co-operate with suppliers, who likewise had to change their processes to supply the suitable (green) components for Itautec's new business concept. At first Itautec was forced to import the new components and absorb the extra cost. Only later was it able to convince its suppliers of the potential opportunities involved in embracing the cause of sustainability, which would bring extra value to their products. In the end, the company was forced to replace more than two thousand components. It was then faced with the task of re-training its entire field team and plant workers.

One would have thought that having replaced so many components, operating well stocked warehouses, and having re-trained its employees that Itautec's transformation to an environmentally

friendly company would have been complete. However, when a company implements change on such a large scale, there is often something that is missed. For example, Itautec's technicians were still making their field visits in fossil fuel cars – not exactly green! To address this, the company migrated its cars to flexi-fuel engines which use Brazilian sugarcane ethanol.

#### **Retailers will not pay extra for environmentally friendly EPOS terminals**

Some people in the industry think that in two years' time all EPOS terminals sold in Brazil will be green, but this is overly optimistic. More realistically it will take at least five years for this to happen, because the average lifecycle of an EPOS terminal is between seven and ten years and there are approximately a million active EPOS terminals installed in Brazil.

Brazilian suppliers of green EPOS products and services are currently few and far between, and retailers are not willing to pay extra for environmentally friendly products and services. Once the contract is won, retailers will typically start to demand greater environmental friendliness from their suppliers at no extra cost.

#### **Does going green give suppliers an edge?**

Does going green give an EPOS supplier an edge? In Itautec's case, going green did not translate into a hike in product price, despite the undoubted additional value to customers, nor did it boost the company's value, at least not directly. If you think that this new way of doing business will give your company an edge, you ought to rethink your strategy. However, going green is a major trend in this industry and there is absolutely no way of avoiding it, not least because of the wealth of consumer pressure. Those who dare to ignore it, do so at their peril. ■

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**EPOS DESIGN**

# A Japanese approach to EPOS design and manufacturing

*By Jenny Teng and Philippe Dal, Toshiba TEC*

Since its creation in 1950, Toshiba TEC has shipped a total of 6.2 million EPOS and ECR units to the world's retail, hospitality and leisure sectors. Having introduced the world's first ECR in 1970, the company has striven to improve upon its retail-hardened point-of-sale solutions ever since.

Toshiba TEC's characteristically Japanese way of manufacturing – known as 'monozukuri', a term which is difficult to translate but which conveys the meaning of a craftsman striving for perfection – continues to be a success with its customers the world over. This is often explained to be a result of its continued and steadfast focus on its core area of competency – retail automation – and of its characteristically long-term commitment to its customers.

## **Manufacturing based on 'monozukuri'**

Toshiba TEC bases its manufacturing of EPOS systems on 'MI2I', a six sigma-driven business process methodology based on monozukuri. 'Design for Six Sigma' (DFSS) seeks to avoid problems in the manufacturing process from the outset by using proven techniques of systems engineering such as the 'Voice of the Customer' programme. In this programme, the company is in daily contact with its customers, and able to gather intelligence on what customers need to realise their ambitions.

The company creates dedicated EPOS project teams comprising skilled creative designers, product development specialists, customer relations experts as well as customers (an indispensable element) to ensure that its products will be embraced by the retail sector. The aim is the translation of customers' requirements and market expectations into technology-driven hardware products characterised by a longevity that should be second to none. Coupled with that is a ubiquitous design format that seeks never to go out of fashion.

Product-related factors, such as price, design, brand influence, service, performance and cost are tangible forms of competitiveness of which customers have a firm understanding. In contrast, intangible factors related to performance at the developmental and production sites are not well understood by the customer. These factors include the productivity and cost of the production process, the defect rate, the time taken to develop a product, developmental productivity and the time to market. Both tangible and intangible factors are important in creating a framework for a successful monozukuri system.

As a result, this characteristically Japanese system of manufacturing is streamlined and designed to have the shortest possible production line. In addition, the company's management has, traditionally, been based on a respect for personnel as represented by lifetime employment together with an increasingly prevalent tendency for staff to acquire multiple skills. Competitiveness via monozukuri depends on its organisational capabilities – this consists of putting each employee's abilities to best use.

Furthermore, the Retail Solutions Business Group has a 360-degree view of EPOS solutions, which is specifically designed to meet market expectations and customer requirements: from the identification of a product concept via the validation of the design and the actual production process and on to serving tens of thousands of customers during its lifecycle until eventual retirement and recycling. This also has the advantage of a single point of contact for the customer.

## **Longevity planning – a cost reduction strategy**

Longevity is one of the core qualities of a Toshiba TEC hardware product and one which stands out in sharp contrast to the alternative – recurring

**This characteristically Japanese system of manufacturing is streamlined and designed to have the shortest possible production line**

**Toshiba TEC is in daily contact with its customers, and is able to gather intelligence on what customers need to realise their ambitions**





**A lack of planning and a belief that 'system maintenance is not an issue for the design team' have been shown to lead to increased costs and below par systems reliability**

- ▶ hardware upgrades and resulting software rewrites which can represent a significant cost over time. A lack of planning and a belief that "system maintenance is not an issue for the design team" have been shown to lead to increased costs and below par systems reliability in numerous situations.

Hardware longevity at Toshiba TEC is incorporated at the design level. Moreover, working with retail systems operators helps produce reliable and retail-hardened EPOS solutions. The process of 'Longevity Planning' can be broken down into several phases, which are distributed across the EPOS hardware lifetime:

*Identification:* To plan effectively for the continued functionality of an EPOS solution, it is necessary to develop an accurate and categorised inventory of all relevant items. This includes: i) Any components that a retailer might require during the years of EPOS operation and ii) A list of any software (in-house, custom-made or off-the-shelf) that might be required to maintain, troubleshoot or validate the subsystem during the EPOS' lifetime to maintain the full functionality of the solution.

*Evaluation:* Each item captured during the identification phase above should be classified according to the significance to the retailer's IT manager. Items with the most critical need should have a higher priority within the 'Longevity Planning' process.

*Preparation:* This phase of the 'Longevity Plan' is focused largely on preparing the retail systems archive to enable the retailer to fully address future needs.

*Inventory:* A detailed inventory of items requiring archiving should be maintained in multiple formats, including paper. The inventory should be accessible electronically and should be searchable

by keyword. It should list all items available by subsystem along with criticality ratings, all contact information, spares depth, and date of last action.

*Documentation:* Along with all routinely deliverable documentation required of each EPOS design team, the longevity requirements for long duration programmes cannot be satisfactorily met without additional documentation. These additional requirements allow the capture of information during the later design and early operational phases of the EPOS solution. Capturing design and operations data at this interim point may prove essential for subsequent longevity efforts.

*Assessment:* Assessment should be conducted as a routine part of any annual or routinely scheduled check which aims to identify items that may become problematic.

*Mitigation:* This phase focuses on efforts to repair or restore any EPOS hardware component after a failure is detected. The 'Retail Systems Archive' should provide all necessary parts, documents, software and tooling as required.

*Migration:* At some point, in spite of extensive efforts to maintain existing technology, it may no longer be possible to sustain the functionality of a system at an acceptable level of reliability. Part of 'Longevity Planning' establishes a set of criteria for the migration to new technology in order to preserve functionality.

Leadership, dialogue and a strong commitment to deliver quality have made Toshiba TEC one of the world's largest vendors of EPOS systems and the leading supplier in Japan. The company continuously sets out to establish the potential for long-term, cost-effective savings through proven programmes, innovative initiatives, and cutting-edge technologies. A clear mission with established expectations is the foundation of this long-term commitment. Developing a sound business case, based on matching requirements to available and reasonably expected resources before committing to a new product development effort, reduces risk and increases the likelihood of successful outcomes. ■

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**POS HISTORY**

# Evolution of the POS terminal

## Origins of POS date back to the 1870s

Point-of-sale (POS) technology can trace its early origins as far back as the late 1870s in Dayton, Ohio, USA. The first mechanical POS terminal was built by brothers James and John Ritty, and influenced by a device which James had seen aboard a river steamer whilst on holiday in Europe. This device counted the number of revolutions made by the steamboat's propeller for maintenance purposes. James, who had a problem with employees pilfering money from his whisky business, wanted a device which counted the number of cash transactions in his saloon. The brothers made several attempts to produce such a device and finally patented their 'Incorruptible Cashier' in 1879. This was the world's first cash register.

The Ritty brothers mass-produced their cash register in a small factory, but the business was unprofitable. In 1881, the brothers sold the company to a Cincinnati businessman, Jacob H. Eckert, who created the National Manufacturing Company. Only three years later, the business was sold again, this time to John H. Patterson, who formed the National Cash Register Company, the firm that in 1974 was renamed NCR Corporation.

## Another heavyweight emerges

Another of today's industry heavyweights has its origins dating back to this period. Thomas Watson



joined the National Cash Register Company in 1895 as a salesman. It emerged however that Patterson, Watson and a number of others were employing underhand tactics to create a monopoly. In 1913, thirty people including Watson were charged with anti-trust offences, and Watson himself was fined and sentenced to a year in jail (the jail sentence was later overturned).

In 1914, Watson became general manager of a struggling company called the Computer-Tabulating-Recording (CTR) Company. The company grew quickly, and in 1924 was renamed International Business Machines – or IBM.

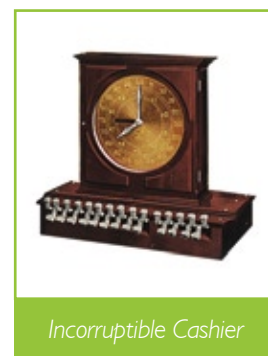
## First electric cash register in 1906

The early mechanical registers were operated either by crank or lever. They recorded data on paper tapes and required an extra step to transcribe the information into a retailer's accounting system. In 1906, Charles F. Kettering, while working for the National Cash Register company, added the first electric motor to a cash register.

## Mainframes revolutionise POS systems

Cash register functionality had not changed for many years, but in 1973 the industry was revolutionised by the mainframe computer. In August 1973, IBM announced the 3650 store system, a mainframe computer that could control 128 POS cash registers. This system was the first computer-driven cash register and was the first commercial use of client-server technology, peer-to-peer communications, Local Area Network (LAN), simultaneous backup and remote initialisation.

NCR quickly followed suit with its NCR 2150. Other computer-based manufacturers of the period included Regitel, TRW and Datachecker. By mid-1974, early users of such systems included Pathmark Stores and Dillards department stores in the USA.



*Incorruptible Cashier*

**James Ritty, whose employees were pilfering money from his whisky business, wanted a device which counted the number of cash transactions in his saloon**

- ▶ A year later, another revolutionary technology was introduced – the first barcodes and barcode readers.

#### **Software comes to the fore**

With the advent of microprocessing technology in the late 1970s and early 1980s, the cash register industry was further transformed. Proprietary mainframe-based systems had limitations, particularly in terms of software functionality and communications capacity.

PC technology and its inherent programmability allowed retailers to be more creative. An early exponent of the new opportunity was a restaurateur by the name of Gene Mosher, who implemented his own customised POS software on an Apple II computer in his *Old Canal Cafe* in Syracuse, New York. It is reported that he was able to take customer orders at the restaurant's entrance and print details in the restaurant's kitchen, so that customers would often reach their tables to find their food already waiting for them. Mosher sold his restaurant business in 1984 and went on to develop the first graphic touch-screen

point-of-sale computer, for which he is ultimately best known.

#### **ECR and EPOS systems emerge**

Since the 1980s, much POS terminal manufacturing has moved to Asia, and the industry has split into two main types of terminal. The first is the generally lower-end, all-in-one machine usually referred to as an electronic cash register (ECR). The other is the more sophisticated electronic point-of-sale (EPOS) terminal, which has superior data processing and programming capabilities.

Modern EPOS systems are often highly sophisticated, integrated with back office merchandising, planning, procurement and business intelligence systems. They continue to evolve, becoming faster, more secure and more reliable, and increasingly they allow retailers to control almost every aspect of their business with a single, integrated point-of-sale network. EPOS technology has come a long way, but with continued innovation from established and new players, it has a long future yet ahead of it. ■

**PC technology and its inherent programmability allowed retailers to be more creative**

**ENHANCE YOUR INTELLIGENCE...**

**See the full picture**

*RBR's detailed industry research provides strategic intelligence and forecasts on the global EPOS market*



**For more details please check out [www.rbrlondon.com/retail](http://www.rbrlondon.com/retail)**

# Conference diary

The diary lists events concerned with retail automation technology for which we have information.

Date	Conference	Location	Organiser
<b>MAY</b>			
6th-7th	KioskCom self servicexpo 2009	Las Vegas USA	JD Events <a href="http://www.kioskcom.com">www.kioskcom.com</a>
6th-8th	MARKETECHNICS 2009	Dallas USA	Food Marketing Institute <a href="http://www.fmi.org">www.fmi.org</a>
6th-8th	World Retail Congress '09	Barcelona Spain	EMAP Conferences <a href="http://www.worldretailcongress.com">www.worldretailcongress.com</a>
6th-9th	Hostec Marketplace 2009	Hong Kong	Allworld Exhibitions <a href="http://www.hostec-hongkong.com">www.hostec-hongkong.com</a>
16th-19th	National Restaurant Association Show 2009	Chicago USA	National Restaurant Association <a href="http://show.restaurant.org/NRA09">http://show.restaurant.org/NRA09</a>
18th-20th	NACStech 2009	Grapevine USA	The Association for Convenience and Petroleum Retailing <a href="http://www.nacsonline.com">www.nacsonline.com</a>
<b>JUNE</b>			
2nd-6th	Computex 2009	Taipei Taiwan	Taiwan External Trade Development Council (TAITRA) <a href="http://www.taitra.com.tw">www.taitra.com.tw</a>
9th-10th	European Retail Technology Summit 2009	Amsterdam Netherlands	National Retail Federation & EHI Retail Institute <a href="http://www.ehi.org/itsummit09">www.ehi.org/itsummit09</a>
22nd-24th	China Kiosk Show 2009	Shanghai China	Shanghai Tiansheng Exhibition Service Co. <a href="http://www.chinakiosk.com.cn">www.chinakiosk.com.cn</a>
22nd-25th	HITEC 2009	Anaheim USA	Hospitality Financial and Technology Professionals <a href="http://www.hftp.org/HITEC">www.hftp.org/HITEC</a>
<b>AUGUST</b>			
11th-13th	Retail Expo 2009	Melbourne Australia	Diversified Exhibitions Australia <a href="http://www.retailtechexpo.com.au">www.retailtechexpo.com.au</a>
<b>SEPTEMBER</b>			
2nd-5th	Hostec Asia / Food & Hotel Thailand 2009	Bangkok Thailand	Bangkok Exhibition Services (BES)/Food & Hotel Thailand <a href="http://www.foodhotelthailand.com">www.foodhotelthailand.com</a>
20th-22nd	Dine America 2009	Atlanta USA	Quick Serve Resources (QSR) <a href="http://www.dineamerica.us">www.dineamerica.us</a>
22nd-25th	EquipMag 2009	Paris France	Exposium / Comexposium <a href="http://www.equipmag.com">www.equipmag.com</a>
<b>OCTOBER</b>			
20th-23rd	NACS Show 2009	Las Vegas USA	The Association for Convenience and Petroleum Retailing <a href="http://www.nacsonline.com">www.nacsonline.com</a>
<b>JANUARY</b>			
10th-13th	Retail BIG Show 2010	New York USA	National Retail Federation <a href="http://www.nrf.com/annual10">www.nrf.com/annual10</a>
11th-14th	HORECAVA 2010	Amsterdam Netherlands	Amsterdam RAI <a href="http://www.horecava.nl">www.horecava.nl</a>
<b>FEBRUARY</b>			
23rd-26th	HOTERES/CATEREX/Japan Food Service Equipment 2010	Tokyo Japan	Japan Management Association <a href="http://www.jma.or.jp/hcj">www.jma.or.jp/hcj</a>