Volume I | 2009

Retail Automation BULLETIN

Self-checkout to drive growth in EPOS spending

Published by Retail Banking Research
www.rbrlondon.com/retail

EPOSsibilities

Retail Automation Bulletin is a new industry journal focused exclusively on automation in the retail and hospitality sectors.

To continue to receive ***Retail Automation Bulletin*** for FREE please return the form below.

Now that's a great possibility...

The *Bulletin* is published by

RESEARCH | CONSULTING | NEWSLETTERS | EVENTS

☐ **I would like to receive a FREE subscription to Retail Automation Bulletin**

☐ **Please send me more information about RBR's latest research on the global EPOS market**

Title (Mr, Ms, Dr) _____ First name _____ Surname _____

Position/Department _____ Company _____

Address _____

Tel _____ Email _____

Please return to **RETAIL BANKING RESEARCH** 304 Sandycombe Road, Kew Gardens, Richmond, Surrey TW9 3NG, UK
Tel: +44 (20) 8940 1398 Fax: +44 (20) 8940 1527 Email: retail@rbrlondon.com Web: **www.rbrlondon.com/retail**

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.

Dominic Hirsch, Editor

Editor Dominic Hirsch
Managing Editor Morten Jorgensen
Assistant Editor Mark Glover, Tomomi Kimura
Contributors Philippe Dal, Mark Glover, Carlos Mauricio Guizelli, Graham Holland, Tom Hutchings, Leo Suarez, Andy Taylor, Jenny Teng, Michael Webster, Lothar Wolf
Subscriptions Manager Susie Lens

For all editorial and advertising enquiries:

Telephone: +44 20 8940 1398
Fax: +44 20 8940 1527
Email: retail@rbrlondon.com

Companies in this issue:

Fujitsu www.fujitsu.com/retail
IBM www.IBM.com/retail
Itautec www.itautec.com.br
NCR www.ncr.com/retail
Posiflex www.posiflex.com
Toshiba TEC www.toshibatec.eu
Wincor Nixdorf www.wincor-nixdorf.com

ISSN 1748-5304

Retail Banking Research Ltd
304 Sandycombe Road, Kew Gardens
Surrey TW9 3NG, United Kingdom

MARKET INTELLIGENCE

Self-checkout to drive growth in EPOS hardware spending

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

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.

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.

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.

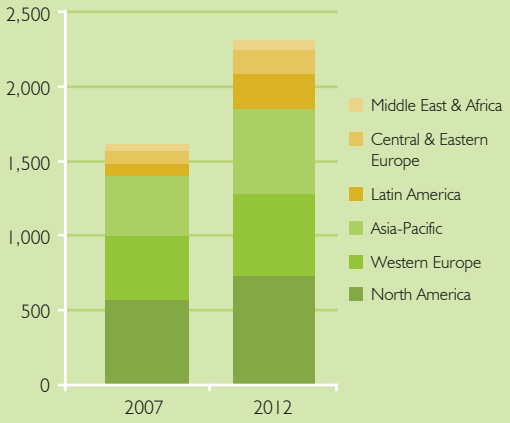
At a country level, the ten largest markets for programmable EPOS shipments in 2007 comprised Canada, China, Japan, Russia, the USA and the 'big five' western European countries.

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 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.

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.

Self-checkout market to triple by 2011

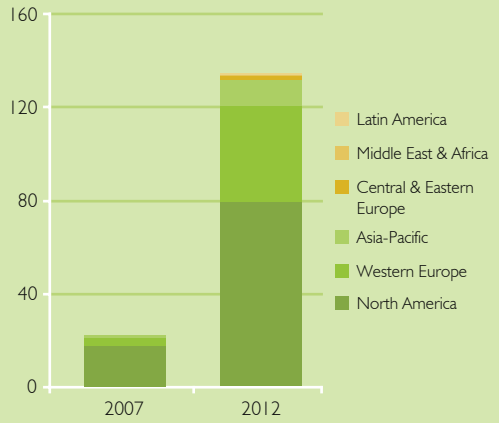
The last decade has seen the retail industry, and particularly the food/non-food business, embrace the ethos of self-service at the point-of-sale. Many of the world's top retailers, including Wal-Mart, Carrefour and Tesco, have started to roll out self-checkout (SCO) terminals in selected markets.

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.

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

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

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

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.

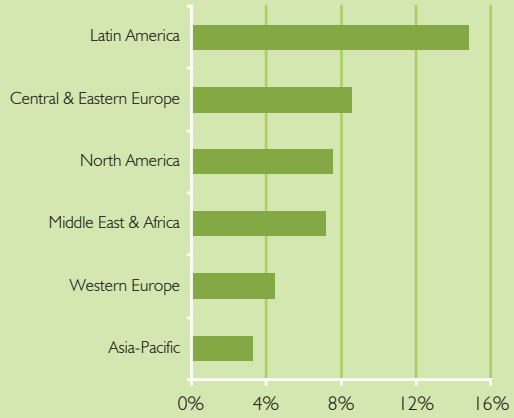
Key drivers of growth in expenditure are increases in the number of shipments (driving hardware revenue) and the installed base (driving maintenance revenue). The initial hardware purchase, together with ongoing maintenance fees, represents the majority of hardware-related spending for retailers.

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 – 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



Source: RBR analysis

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.

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.

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

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.

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

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. ■

Michael Webster (retail@ncr.com) is Vice President and General Manager for Retail and Hospitality at NCR (www.ncr.com/retail).

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.

Incorruptible Cashier

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.

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

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. ■