Asian Journal of Applied Science and Technology (AJAST)
Volume 1, Issue 8, Pages 01-04, September 2017

Technology at Point-of-Purchase - A Journey from Electronic Cash Registers to all Inclusive Point-of-Purchase Systems

Kingshuk Mukherjee

Department of Design, Banasthali University, Rajasthan, India. Email: kingshuk.bid@banasthali.in

Article Received: 24 August 2017 *Article Accepted: 06 September 2017* *Article Published: 08 September 2017*

ABSTRACT

Point-of-purchase at retail stores represents the time and place at which the final stage of sale and purchase takes place. The parties involved are the seller, the consumer, the money, and the product. With the help of various essential tools, such as salespeople, unit price verifiers, billing machines, and many interactive tools which have more-or-less become default and essential to some extent, such as display unit, bar-code scanning and electronic swipe machines, the marketer hopes to create a favorable shopping experience for the consumers, and thus creating user-friendly environment for the shopper to visit again. The use of computers and other automated systems at retail Point of Purchase has made lives easier for all the retail channel partners including the consumers (in today's terminologies, consumers have become an integral part of the value chain or the distribution channel). It has brought efficiency like never before. The use of modern Point of Purchase systems, also known as the 'Point of Sale (POS) systems, have manifold advantages to all the channel partners. Automation in a real sense was initiated a retail POS in the form of Electronic Cash Registers which the consumers see as automated billing machines. This development occurred in the late 1960s and provided many advantages over the conventional book-keeping techniques. Then came the more evolved electronic POS systems, commonly known as EPOS which integrated Bar Code scanning (RFID technology) along with a more user friendly display monitor, magnetic card swipe system and bill-printing machines. All these developments along with the automation systems that followed revolutionized not only the retail end but the entire value chain.

Keywords: Retail, Automation, Point of Purchase, Point of Sale (POS)

1. INTRODUCTION TO RETAIL TRANSFORMATION

Retail has gone through a sea change over the past few decades. It has gone through massive transformations. Starting from the American general stores in the 1850s, retail has covered the glorious journey of transforming this industry into an indispensable part of people's lives. Throughout centuries, retail industry has taken herculean leaps from being totally unorganized sector of the value chain towards semi-organized units and then eventually into full-fledged organized sectors.

2. INTRODUCTION TO AUTOMATION IN RETAIL BUSINESS

All have witnessed the 'divine intervention' of automation at each and every possible level in the entire value delivery process. This has resulted in more efficient and effective organized trade. Automation has the key role to play in reducing lead and transit times in the delivery process. Automation has also resulted in minimizing errors in inventory and warehousing and in logistics systems.

Automation has played a major role in this new age organized retail sector. The focus of this discussion is towards the fruitful intervention of 'Information systems' in retail. Retail information systems can enhance business processes. The phrase 'information systems' brings to mind the image of computers, activities involving computerized feeding of data, processing of the data, and finally generating reports for the use of the organizational management. The introduction of computers has had a huge impact on the flow and management of information systems. Information systems have now become full-fledged functions of a modern business set-up. It was only with the popularity of computers that these information systems were formalized. They have evolved into something which is more meaningful. We would specifically talk about automated information systems which we can term as Information Technology (IT) in modern parlance. Therefore, a system that enables people to gather, consolidate, and present information in a meaningful and intelligent manner can be termed as modern day information systems. These modern day information systems are a set of interconnected systems having common databases useful for all functional units of the organization such as automated acquisition, storage, movement, and sales.

3. TRANSACTION PROCESSING SYSTEMS

Management information systems can be divided into various categories. We would specifically talk about Transaction Processing Systems (TPS) which helps at the operation management level. The day-to-day operations in a retail organization are managed by people and systems known as 'operations' or 'operation management'. They feed day-to-day data/transactions and create basic documents such as bills & purchase orders. The major components of a transaction processing systems in any retail organization can be as follows:

i. Purchase & supply management.
ii. Sales & distribution management.
iii. Warehousing & Inventory management.

The documents generated by the operation management team are then further analyzed and used by the Management Information System (MIS). MIS is for the middle level managers in any organization and they work on the primary data generated by the TPS. Such primary data can be the daily sales reports, cash-collection reports, etc. MIS can have access to the organization's current performance indicators as well as the historical records. MIS relies on the routine

reports such as daily sales report, cash collection reports generated by the TPS at the 'point of sales'.

4. COMPONENTS OF RETAIL INFORMATION SYSTEMS

Modern day organized retail cannot be imagined without the backbone of an automated information system. The traditional single store family-run business set-ups were easier to manage because of its small size and lesser complexities of operation. These shops were conventionally managed by owners themselves. But the modern day retail chain stores, with larger than life retail formats such as department stores, discount stores, super-markets, and hyper-markets, cannot be efficiently and effectively managed without the intervention of the new age information systems. Technology proves beneficial in creating and maintaining customer relationships. Analysis of the data collected at the 'point of sales' helps understand preferences, buying habits, spending patterns and budgets of the present customer base. Relationships are maintained by utilizing IT for informing the customers about the latest offers and schemes, loyalty rewards, and new arrivals, just to name a few. This information can reach the customers through automated push mails and 'SMS'es which are initiated with the help of retail information system support.

While deciding technology at the retail front-end, the management also has to look at the smooth and efficient flow of traffic at the stores which includes fast billing systems. Rapid billing systems will ensure proper check-outs and in-turn will lead to customer satisfaction.

5. ELECTRONIC POINT OF SALES

The increasing growth path of the retail industry has generated a lot of interest in the international community of vendors for providing technological support systems at retail POS. Use of computers for a fast and accurate billing system brings efficiency at the retail check-out. Moreover, computers help to create the database of sales and customer data, on which future actions and decisions of the company would be based. All this makes retail information systems a core component of the business model. Retail POS is the first place where automation should be initiated. The creation of huge databases, efficient information systems, and customer satisfaction begins with automating point of sales in retail.

Electronic cash registers (ECRs) were the basic billing machines which came in the late 1960s and provided many advantages over other methods for billing at retail stores. It helped the retail front end executive in creating purchase bills and printing receipts and basic sales reports. ECR provided many advantages over other conventional methods of book keeping at retail front-end. In comparison to manual billing systems used at that time by semi-organized retail shops, in an ECR, price calculations were automated. This increased the efficiency of work and also minimizes the risk of manual errors in price calculations and additions.

Early electronic cash registers (ECR) were limited in function and communication capabilities. In August 1973 IBM released the IBM 3650 and 3660 store systems that were basically mainframe computer used as an in-store controller for point of sale registers. By mid-1974, it was installed in Pathmark stores in New Jersey and Dillard's department stores. One of the first microprocessor-controlled cash register systems was built by William Brubeck and Associates in 1974, for McDonald's Restaurants. It used the Intel 8008, a very early microprocessor. Each service desk in the restaurant had its own device which displayed the entire order for a customer.

In today's scenario, the cash register of even the smallest business is attached to a computer via "point-of-sale" (POS) systems. These systems have grown in popularity over conventional cash registers because they don't just help close the sales, but they also help to amass vital, real-time information about the inventory and customers. Modern day Electronic POS machines are computer microprocessor based billing systems that allows greater control over the retail business. One of the important objectives of automating point of sales is to streamline billing operations and increase efficiency. A standard EPOS (Electronic Point of Sales) can easily handle payment systems, updates inventory and provides instant reports on sales and stocks.

The major components of EPOS are as follows:

i. Integrated Receipt printer.
ii. Cash Drawer: EPOS comes with a pre-fitted lockable cash drawer.
iii. Bar Code Scanner.
iv. Magnetic card Swipe for swiping credit/debit cards.

Benefits of EPOS:

i. The system can be connected with ERP systems and supply chain at the back office of the retail organization. Since EPOS systems run and support specialized software, it can connect with other organizational software systems running in the back offices.
ii. EPOS systems create database, i.e. the backbone of a major chunk of decision making systems of the organization. Analysis of database helps the management to take day-to-day decisions such as the decision to focus of on the more profitable lines of business, improve demand forecasting, and minimizing inventory wastage. It can also help the organization in some strategic decisions such as introducing new product lines and close down loss making lines.
iii. Integration of stock control system can be a major achievement of EPOS. This allows keeping stock information up-to-date in 'real-time' and streamlines supply chain processes. An EPOS system automatically determines which products are 'fast-moving' and when they need replenishment. Moving a step forward, some EPOS systems allows for linking their software system with the suppliers' back office systems. With the fast-track system of procurement and JIT (Just-In-Time) concepts of inventory management, suppliers themselves can monitor sales figures of their customers, and take purchase decisions accordingly. Advanced EPOS enabled organizations can monitor stock movement and take required steps in advance. Information can be channeled through the warehouse and purchasing departments, thus enabling 'automated purchase and replenishment' (Automated purchase and reordering follows creation of purchase orders and

pushing the orders through the suppliers' systems based on pre-set re-order levels of inventory).

6. ADVANTAGES OF AN EFFECTIVE POINT OF PURCHASE SYSTEM FOR RETAILERS

An effective POP / POS program can be of immense help in competing heads-on with other retailers. It can come to retailers' support in creating an edge over competitors by adding more intangible value to their service levels. Therefore, it can be stated that marketers who can manage systems and events more effectively at the point of purchase can gain competitive advantage. Moreover, an integrated POS system can make life at retail store easier for the store representatives and the management team. A POS system that rings sales, tracks inventory and helps to grow business can be one of the biggest assets for a retailer.

A POS system is an investment well justified. Without a doubt, the biggest advantage is the ability to get an immediate, up-to-the-minute, accurate assessment of the store inventory. Each time a customer moves out of the check-out counter, the goods sold are immediately subtracted from inventory list and the list gets updated in real time. Keeping track of the thousands of items that make up a small business can be a real comprehensive and major task for any retailer. Moreover, consistently keeping hard-to-find items in stock can add up to a competitive advantage over much larger competitors. A good POS system can help, allowing to set an alert that lets know when a given item is at the re-order point. When it's time to re-order, some POS systems tell about both the most recent price paid, as well as the average price paid in the past. It can also help to identify most trusted vendors who have performed well over the past.

In addition to tracking inventory, a good POS system also helps keeping track of good customers. Good customers can be identified with the help of their profile with the store and other related stores of the same parent company as well. With the customer's purchase history visible right at the cash register, the store staff can be trained and informed to reward good customers with small little surprises such as discounts vouchers or adding small gift items in their shopping cart. It is always a good idea to reward loyal customers which helps to reinforce goodwill and creates excellent word-of-mouth publicity for the store.

7. VENDING MACHINES

Vending machines are more advanced level of automated retail systems which not only allows for billing (bill is not required at all in vending systems), but also performs tasks of retail sales representatives, store, and delivery mechanism. Vending machines have been in practice for long for few product categories which are highly standardized in nature and are of comparatively lower price values and which do not require the intervention of sales personnel. Vending machine is a successful retail channel for fast moving goods such as stored food items and medicines, service industries such as ticketing, to name a few. A vending machine works on the principle of dispensing products and service receipts on payment deposits by customer in form of currency notes, coins and at times on swiping credit/debit cards. The first coin operated vending device dispensed post-cards, introduced in London in the early 1880s.

Vending machines are gradually finding acceptance in the retail channel and more modern versions of vending machines are being installed at various public places such as railway stations, airports, university campuses, just to name a few.

8. RECENT DEVELOPMENTS IN POS SYSTEMS

Recently new applications have been introduced, enabling POS transactions to be conducted using mobile phones and tablets. Mobile POS (mPOS) terminals are expected to replace a large portion of the more conventional payment techniques because of various features including mobility, upfront low cost investment and better user experience. Convenience of conducting remote financial transactions is expected to augment the demand from small and medium businesses for mPOS.

9. CONCLUSION

For retail organizations, automation at Point of Sales with the latest electronic devices is a step forward towards embracing technology to enhance the operations, decision making, and customer satisfaction. Electronic POS provides the most appropriate solution for the corporate retail chains, super-stores and hypermarkets. Electronic POS has resulted in much more efficient retail operations. It has also resulted in significant reduction in feeding and calculation errors due to manual and other mechanical tools for retail check-outs.

EPOS has transformed the entire supply chain systems by integration of the POS software with automated replenishment and re-ordering systems of the organization as well as with other suppliers. This has resulted in clarity and transparency at all the levels of the buying systems of any retail organization. EPOS can be duly credited to the significant reductions in lead and transit times and thus ensuring instant stock replenishment and subsequently greater customer satisfaction.

The trend is moving towards more advanced EPOS solutions which can provide efficient 'Point of Purchase' experience to the customers and can help the retailers to add value. Potential scope for further automation aims to consider more interactive systems which require lesser human intervention and which can lead the way towards a 'self-service environment'.

REFERENCES

[1] Chetan Bajaj, Rajnish Tuli, Retail Management: Oxford, 2010.

[2] Antony Welfare, The Retail Handbook: Jaico Publishing House, 2013.

[3] Peter Fleming, Retail Selling: How to Achieve Maximum Retail Sales: Jaico Publishing House, 2006.

[4] New Directions in Shopper Technology: Outskirts Press, 2013.

[5] John Quelch, Kristina Cannon-Bonventre, Better Marketing at the Point of Purchase, Harvard Business Review, Issue: November 1983.

[6] Steven Aldrich, Point-of-Sale System Basics for Retailers.

[7] Charles S. Areni, Dale F, Duhan, Pamela Kiecker, Point-of-Purchase Displays, Product Organization, and Brand Purchase Likelihoods, Journal of the Academy of Marketing Science, Vol.27, Issue 4, September 1999.

[8] James E. Dion, The Effects of POS Implementation and Retail Technology on Sales and Profitability for Small to Mid-Sized Retailers, April 2003, retrieved from www.dionco.com/public/articles/POS_Study_White_Paper.

AUTHOR BIOGRAPHY

Mr. Kingshuk Mukherjee is working as Assistant Professor in the Dept. of Design at Banasthali University, Rajasthan, India. He is the author of a book and several academic articles. He has proposed and developed course curriculum for several renowned universities like IGNOU, New Delhi, SNDT University, Mumbai and MS University, Pondicherry. His area of research is Fashion and Lifestyle.

[9] Matthew Cote, The Power of Point of Sale Improving Growth, Profit, and Customer Service in a Retail Business, April 2015.

[10] Rajagopal, Point-of-sales promotions and buying stimulation in retail stores, Journal of Database Marketing & Customer Strategy Management, Vol.15, 2008, retrieved from www.palgrave-journals.com/dbm/

[11] James E. Lynch, The impact of electronic point of sale technology (epos) on marketing strategy and retailer supplier relationships, Journal of Marketing Management, Volume 6, 1990 - Issue 2.