ILM Beaches Designs
Tom Pickles
410 Bobby Jones Rd
Wilmington, NC 28412

Phone: (910) 232-2176
E-mail: trpickles@aol.com

WHITE PAPER – RENTAL OR "UTILITY" THEORY FOR POS HARDWARE

Back to the future. Is the market ready for Hardware as a Service?

How much POS did you use this month?

About the Author 2
Computers - The 60's and 70's 3
Computers in Retail – Service Bureaus and Leases 3
Larger Retailers Leased Mainframes and POS 4
The Bar code and universal product code 4
The unbundling of Software, Service, and hardware pricing 5
The IBM PC – 1981 – Purchase only 5
Point of Sale and The PC – An industry Shift 6
POS with ISV software and Microsoft. 7
1990–1999: IBM's near disaster and rebirth – from Rental to Purchase 7
The on demand "Retail" world 8
POS - Software as a Service - SaaS 8
POS - Hardware as a service - HAAS 9
POS – Monthly rental 9
POS Rental – A manufacturers view 10
POS - HARDWARE as a Service - Summary 10

White paper – Rental Theory for POS Hardware

A look at history reveals Back to the future. Is the market ready for Hardware as a Service?

ABOUT THE AUTHOR

Tom Pickles has a unique perspective on the history of IBM and other vendor hardware, software, and services acquired and used by retailers. With nearly 40 years of IBM and partner experience ranging from manufacturing, to field sales, to marketing, to channels, and partners (nearly all within the retail industry), he gives the reader insight into IBM's role as a provider of computers, POS, and solutions to the retail industry and how that applies to renting POS to retailers in today's market.

In July of 1968, Tom joined IBM in East Fishkill, NY. At this IBM Development Lab he created test silicon wafers that were used to build chips that would end up in IBM processors. East Fishkill continues today as IBM's leading manufacturing location for microelectronics.

After a military and education leave, he began selling IBM computers to small businesses from the Buffalo NY, IBM Branch Office. Retailers became his primary market. The System 3 and 32 computers were primarily used for Inventory, Accounts Receivable, and Payables. Also, he sold System 7's to retailers to be used for Credit Authorization and IBM technologies to convert paper tape POS output to magnetic tapes to be sent to service bureaus. Retailers rented, leased, and purchased these computers.

During the 1980's Tom sold IBM computers and POS systems to retailers in the Northeast from the Hartford Ct, IBM Branch Office. In addition to mid size computers, larger retailers purchased or leased water cooled 3083's and 3090's and the 4300 line of mainframes. Also, retailers purchased Series 1's for Distribution Center applications. POS was sold with partners and IBM assisted in large rollouts of POS in Tom's accounts. Again, retailers leased, rented, or purchased these technologies.

During the 1990's, Tom joined IBM Worldwide POS industry in Raleigh, NC. His customer and field experience was applied to marketing IBM POS products around the world. During this decade IBM dominated the POS industry and IBM POS channels and partners grew substantially. POS was predominately a purchase only financial model.

In 2004, Tom retired from IBM and joined JDA Software Group to launch JDA Store Systems new POS products and create JDA's distribution channels using Value Added Remarketeers. He also created a monthly rental model for JDA's MMS and WinDSS products.

Since 2007, Tom is living on the North Carolina coast and is consulting retail solution providers on various projects and launches. The objective of this white paper is to use his experience and discuss how the idea of offering POS hardware on a rental basis, **or Hardware as a Service**, to the market is a new opportunity.

COMPUTERS - THE 60'S AND 70'S

Evolution of IBM's computer hardware

The story of IBM's hardware is intertwined with the story of the computer industry – from vacuum tubes, to transistors, to integrated circuits, to microprocessors and beyond. The following general purpose computer systems applied to the retail industry (both large retailers and SMB retailers) and the following series represent key steps:

- System/360
- System/3
- System/370
- IBM Series/1
- IBM PC
- System/390
- AS/400
- RS/6000
- zSeries

On April 7, 1964 the entire concept of computers changed. IBM revolutionized the industry by bringing out the first comprehensive family of computers (the System/360). This upgradable series caused many of their competitors to either merge or go bankrupt, leaving IBM in an even more dominant position.

By the mid 1960's the computer was seen as an information processor, being part of a management information system. Advertisers stressed the "flexibility, versatility, expandability, and …the capacity of the computer to make logical decisions."

The System/360, controlled almost 70% of the computer market and there was a long wait for their mainframes. IBM's advertising strategies soothed consumers who were concerned about and unfamiliar with computer technology[1]

COMPUTERS IN RETAIL – SERVICE BUREAUS AND LEASES

Retailers in general were not leaders in the use of IT. Merchandizing systems, planning, purchase orders, receiving, allocation, distribution, POS, ticketing, returns, were manual systems. One of key problems with tracking items down to the unit level was that there were no standards as to item identification. Retailers did their own thing such as sticky tickets, Kimball tickets, OCR-A, magnetic stripes, and even 96 column cards, There were no item id standards between manufacturers and retailers.

Since my Western New York territory as an IBM salesman was comprised of new accounts, and primarily small and medium size businesses, I discovered that SMB (small and medium business) retailers were an untapped territory. Business applications such as POS, sales collection, merchandise processing, payables, stock ledger, and accounts receivable were either done manually, or via a service bureau.

The service bureau model was similar to a pay as you go model. The retailer in essence rented or leased the service, to solve the business problem. They did not own, or lease the technology…only

[1] Computer History Museum http://www.computerhistorymuseum.org

the solution. Common Service Bureau solutions would be sales reporting, stock ledger, credit authorization, or sending monthly “country club” billing statements, and receiving payments.

However, as small business computers such as the System 3, System 32 and System 34 began to come to the industry, the departmental in house computer (almost always leased) began to replace the monthly service bureau cost. Retailers started to get exposed to Data Processing Managers, computer rooms, operations, software, technical support, etc.

In my experience as a IBM salesman in the 70’s, the outright purchase of mainframes and mid range computers was out of the question. It did not make sense The financial model did not lend itself to purchase, the computers were mysterious to end users, there were many unknowns, and in the 60’s and 70’s this was their first venture into using technology.

LARGER RETAILERS LEASED MAINFRAMES AND POS

During the late 60’s and 70’s, large retailers were a natural market for mainframe computers. Many of the larger retailers were department stores and grocery stores where a centralized philosophy makes so much sense. Traditional retailers had private label credit cards since this was their strategy for CRM. A centralized system with centralized account, vendor, and merchandise files was essential to running the business. Any automation that occurred at store level, was done with centralized online applications and “green screens”. Grocery chains could not handle the volume item information from checkout lanes, but had large central ordering, receiving, and warehousing applications running from central site. Often, if they collected detailed POS data, it was sold to outside firms for sales analysis for consumer goods manufacturers.

The big box retailers began emerging in the 80’s. This growth market was also very centralized and was a natural market for centralized, on line systems, including POS.

Any retailer that had a mainframe also had a need for POS hardware. Since IBM had a dominate market share for mainframes and since retailers maintained the “online or central” philosophy, having a POS system that was totally managed from central site was the only way feasible.

Because of IBM mainframe expertise in mission critical applications and high availability, the same concept was applied towards a POS architecture. POS terminals and subsystems were attached to distributed controllers that were on line to central. High availability and performance were delivered with the ability to run offline from the mainframe.

It was IBM’s dominance in the centralized mainframe that was used by retailers that allowed IBM to create a POS product philosophy that exploited the centralized concept. IBM could bundle a POS hardware architecture along with operating system and application software and deliver a total solution to the retailer, often on a monthly lease arrangement.

THE BAR CODE AND UNIVERSAL PRODUCT CODE

Norman Joseph Woodland and Bernard Silver developed the idea for the barcode. Woodland and Silver filed US patent 2,612,994 on October 20, 1949 for "Classifying Apparatus and Method. They were issued the patent on October 7, 1952.

Woodland who was an IBM employee and Silver built the first barcode reader in 1952.

On April 3, 1973, Woodland at IBM developed the linear barcode, which was adopted as the Universal Product Code, or UPC. History was made on June 26, 1974, when a pack of Wrigley's Juicy Fruit chewing gum became the first retail product sold using a barcode reader. This historical event occurred at Marsh's supermarket in Troy, Ohio. This very pack of gum can be seen at the Smithsonian's National Museum of American History.

President George H. W. Bush awarded the National Medal of Technology to Woodland in 1992.[2]

The bar code itself became the impetus for scanning at the POS. The barrier to item identification was removed. POS exploded, data exploded, information exploded, and computers in retail exploded.

The UPC is an example of a very efficient technique of identification of an item. It is very cost effective and practical. But it is not the end of merchandise identification.

Merchandise identification is an industry in itself. A next generation of product identification is on its way. We are in the early stages of "active" identification (RFID) rather than "passive" identification (UPC). Over the next decade or so, Radio Frequency Identification may replace the bar code. There will come a day when the item does not need to be scanned. It will identify itself, using a transmitter and receiver that is activated on demand. The physical item will not need to be handled by the shopper or the sales clerk. There may not even be a sales clerk or a POS device. It will change the definition of Point of Sale to Point of Purchase and it will be something different in the not too distant future.

THE UNBUNDLING OF SOFTWARE, SERVICE, AND HARDWARE PRICING

In 1969, IBM "unbundled" software and services from hardware sales. Until this time, customers did not generally pay for software or services; software was provided at no additional charge, generally in source code form; services (systems engineering, education and training, system installation) were provided free of charge at the discretion of the IBM Branch office. This practice existed throughout the industry. Quoting from the abstract to a widely-read IEEE paper on the topic

> Many people believe that one pivotal event in the growth of the business software products market was IBM's decision, in 1969, to price its software and services separately from its hardware

At the time, the unbundling of services was perhaps the most contentious point, involving antitrust issues that had recently been widely debated in the press and the courts. However, IBM's unbundling of software had long-term impacts. After the unbundling event, IBM software was divided into two main categories: System Control Programming (SCP), which remained free to customers; and Program Products (PP), which were subject to a separate cost. This transformed the customer's value proposition for computer solutions, giving a significant monetary value to something that, before, had essentially been free. This helped enable the creation of a software industry.

Similarly, IBM services were divided into two categories : general information which remained free and provided at the discretion of IBM, and on-the-job assistance and training of customer personnel, which were subject to a separate charge and were open to non-IBM customers. This decision vastly expanded the market for independent computing services companies[3]

THE IBM PC – 1981 – PURCHASE ONLY

Since the IBM Personal Computer was very intriguing to me I decided to take advantage of an IBM employee discount and purchase one of the first models announced. I paid about $3,000 for a PC with 16K memory, a floppy diskette drive, (no hard drive), a green screen monitor, and keyboard, mouse, and matrix printer. It came with DOS and a spreadsheet program (VisiCalc). What a deal!

---

[2] http://en.wikipedia.org/wiki/Norman_Joseph_Woodland

[3] pp. 59-63 1058-6180/02/$17.00 © 2002 IEEE **Software Unbundling**: **A Personal Perspective** Watts S. Humphrey, Carnegie Mellon University

Time magazine chose the "personal computer" as its 1982 Man of the Year.

It did not take long for small business that were in the Electronic Cash Register business to recognize that a PC could be programmed to perform checkout functions. Innovative companies such as Data Terminal Systems started to recognize that a specialized; purpose optimized device could be programmed to store many items for look up. Component manufacturers of printers and cash drawers recognized the potential of providing specialized peripherals to attach to PC's so that cash register functions could be sold to retailers.

Small firms recognized that PC components could be purchased on the open market and a new cottage industry that manufactured PC Clones emerged and some became specialized by attaching component cash drawers and printers to the PC. The PC Cash Drawer appeared on the POS market.

Little did we all know at that time what impact the PC would have on the Point of Sale Industry. We did not realize how fast technology would change from this point forward.

It was very apparent to all, that the financial model would be a purchase only model. Over time we also realized how quickly technology would be outdated by future models. Chip technology raced ahead and Microsoft became the de-facto standard for the operating system. These firms were not interested in looking backward at technology compatibility.

Unfortunately, the PC Industry continued to change extremely fast. Therefore, those customers' investments in PC technology was not protected. Fortunately, the amount of technology power that could be purchased for the same or less dollar amount exceeded previous models.

Over time retailers realized that PC's for Point of Sales came cheap, but in the long run the short shelf life, error prone I/O attachment of cables, power supplies, and non-compatible components created a less than perfect environment for system management over time.

But clearly, the days of the rental of POS were over.

POINT OF SALE AND THE PC – AN INDUSTRY SHIFT

IBM's first generation POS systems (3663 Supermarket system and the 3650/3660) was announced in 1973 and IBM's second generation (3680 Programmable System) was announced in 1979. The target market place for these POS system was retailers that had an IBM mainframe installed. The high availability, distributed, on line or store and forward to central mainframe architecture proved to meet the requirements of retail accounts. Retailers commonly leased these POS systems under the main IBM contract that already existed with the retailer.

However, with the introduction of the IBM PC in 1981, the IBM developers of the first and second generation POS systems recognized the potential of applying a specialized POS operating system, applications, and unique POS peripheral requirements to the component, modular architecture of the IBM Personal Computer. Now there was an approach that totally separated the POS system from the mainframe. IBMs third generation of POS was born from the PC hardware platform.

IBM's dominant mainframe market position in large retail accounts meant that the requirements of high availability, distributed, mission critical, and high performance POS systems must still be met. PC's did not have an operating system that could handle the performance and availability requirements. PC's did not have the capability of supporting unique POS peripherals, and robust POS applications did not exist. In 1987 IBM announced the 4683 hardware, the 4680 Operating System, POS peripherals, and Supermarket and General Sales applications.

The primary market for the IBM 4680 System and applications remained with IBM Direct servicing large retail accounts with a large chain of stores that predominately had an IBM Host. IBM strategy was a total solution strategy.

Hardware, Software and Services were often bundled leased, although the PC nature of POS hardware meant that retailers were choosing purchase more often, especially with PC's being used as POS controllers or severs in the store.

POS WITH ISV SOFTWARE AND MICROSOFT.

In the fall of 1988, IBM Store Systems announced the 4684. IBM had much experience with high end POS systems and the hardware was proven solid by thousands of high production supermarket, mass merchants, and department store installations.

The 4684 running Microsoft DOS removed the POS hardware from the 4680 OS / 4680 applications solution strategy. The exploding number of former ECR and PC based DOS point of sale software vendors recognized the value add of a hardware manufacturer such as IBM and Windows based POS applications that ran on PC's. IBM then created an entire new POS Business Partner Channel to pursue the market of the hundreds of SMB retailers that IBM could not directly reach.

Concurrently, the market of smaller retailers that did not have mainframes installed was emerging. Independent software providers were writing applications for the IBM System 3 and 34 mid range systems for retailers. Retailers recognized that the only way to compete against the Tier 1 retailers was to differentiate with specialization and become more efficient with automation.

The financial method for retail POS acquisition was cast in stone. It was a purchase only model and retailers would purchase or finance their POS equipment.

1990–1999: IBM'S NEAR DISASTER AND REBIRTH – FROM RENTAL TO PURCHASE

IBM's traditional mainframe business underwent major changes in the 1990s, as customers increased their emphasis on departmental and desktop computing. However, the decade of the 1990s began with IBM posting record profits up to that point in its history. This proved illusory as the rental to lease conversion was tapping out, demand for mainframes was waning and corporate downsizing was in full swing. Corporate spending shifted from high profit margin mainframes to lower margin microprocessor-based systems and the growth in IBM's PC business was not nearly enough to offset the company's mainframe revenue decline.

A decade of steady acceptance and widening corporate growth of local area networking technology, a trend headed by Novell Inc. and other vendors, and its logical counterpart, the ensuing decline of mainframe sales, brought about a wake-up call for IBM: after two consecutive years of reporting losses in excess of $1 billion, on January 19, 1993, IBM announced a US$8.10 billion loss for the 1992 financial year, which was then the largest single-year corporate loss in U.S. history.

That same year, Louis V. Gerstner, Jr. joined IBM and he is widely credited with turning the company around. His strategy to reverse the decision of his predecessor and re-integrate IBM's major divisions to focus on services first and products second, is often heralded as the decision that led the company from the brink of disaster and remains the fundamental underpinning of IBM's strategy today.

A byproduct of that decision was a shift in focus significantly away from components and hardware and towards software and services[4]

[4] http://en.wikipedia.org/wiki/History_of_IBM

THE ON DEMAND "RETAIL" WORLD

There is a theme emerging in the world of IT services. The theme centers on changing how services are designed, developed, tested, and implemented. And the key word here is "services". Services include the software, the hardware, the operations, the support, the maintenance, and the ongoing enhancements that are needed to compete in the difficult retail business world.

Perhaps its no different than the Service Bureau of the 60's and 70's. But it is often called something other than a Service Bureau. Its called Outsourcing, or ASP, or Hosting, or Software as a Service, or Utility Computing, or Cloud or Grid Computing, and it appears to be a direction for next generation services.

Is the Retail Industry going to be an early adopter of a new delivery model? Perhaps. There is no doubt that the internet, the web, the networks and the architecture of the latest generation software are solid enough and ubiquitous enough to be the foundation to provide these services.

The internet has changed the lives of consumers and today's youth. It is clear that when we need to buy a product that is traditionally sold by retailers, we behave differently now because of the internet. We browse the internet to find out detailed information about products. We easily compare products to competitive products. We find out who sells products, how they are priced, how they are reviewed, if they are in stock in the local store, specials, etc. etc.

Today's consumers and shoppers live in an "on demand" world. When they want to know something about or buy products, they want to know the information now. They don't have to wait anymore. They don't have to waste time or wonder. It's easy to make a decision to purchase an item, without ever leaving home, without any physical item present.

Brick and Mortar stores are not going away. Items that consumers want to purchase are not electrons on a screen. They have texture and touch. They have look and feel and fit. And if consumers make the decision or narrow down the decision to buy an item using the internet, if they can go to the store and have it ready for them to bring home, everyone wins. When the internet and the store become a single view to the "on demand" shopper the retailer becomes an "on demand" retailer.

Retailers know that the shopping experience is critical for customer retention and loyalty. IT services should be crafted that enables the browsing or purchasing decision to be made on the internet and integrates into the pick up or check out process at the store. These kinds of services are customer facing services. They drive additional revenue to the retailer.

POS - SOFTWARE AS A SERVICE - SAAS

When a consumer has a shopping experience with a retailer it may occur in any channel. It may occur thru a promotional ad, a catalogue, browsing on the internet, in the store, at POS, with a sales associate, on a cell phone, at a kiosk, or even from a shopping cart.

Since the new generation of POS and customer transaction software is based on component, web, service based architecture and is platform independent, it makes all the sense in the world to be able to deliver the software in any number of ways, based on what type of device the consumer uses.

If you review all of the software providers that deliver Point of Sale applications, they clearly are offering services that address multi-channel, kiosk, hand held, e-commerce, and CRM applications. They all are delivering software modules that use consistent customer and item data across various delivery channels.

The retail shopper transaction set is a natural one where re-use of business objects makes sense. Shopper information, item information, vendor information, credit or debit card information is identical no matter what kind of technology device the shopper is using.

Shopper transaction software ia a perfect match for the SaaS delivery model because SaaS is an activity that can be delivered in a number of ways. SaaS describes a software-on-demand model that uses a utility pricing model rather than term licensing.

Retailers would welcome a pay for usage model and find it extremely appealing and sensible. Retailing clearly has peaks and valleys of customer traffic, seasons, and retailers are attempting to reach shoppers in different channels and different devices.

Retailers would gladly pay for software only when and where it was used. Retail is clearly an "on demand" industry. And there is no reason that the hardware devices that run this software could be offered using the same on demand model.

POS - HARDWARE AS A SERVICE - HAAS

The point of sale terminal will always exist in the brick and mortar store. As long as cash is a tender and as long as security and loss prevention are required, retailers will always require a device to enforce company policy and procedures at check out. There will always be a requirement to capture and secure customer, item, financial, and employee data for every transaction. And there will always be a need to run off line, if the network is not available.

POS is a large expense in a retail enterprise and there are usually many devices to buy since retailers must reasonably plan for their busy periods. Therefore price point is critical, yet reliability and durability must be designed into the product due to the rugged POS environment.

If a retailer could pay for only how much POS they used, this would change the game. Retailers would not use money for POS purchases but rather spend it on merchandise or new store openings. They would conserve credit and credit lines for more strategic investments. Money would be used to make money and not be wasted on acquiring and owning a depreciating asset. POS assets are off balance sheet and POS hardware could be obtained with no down payment.

It would be a compelling message for a retailer to not need to worry about technology obsolescence. A retailer could obtain a solution when they needed it and discontinue the use of it, when its not needed. Maintenance and hardware updates are provided by the services provider, alleviating the burden from the retailer. The hardware service would be a hedge against inflation and technology change.

More often than not, retailers tend to make purchase decisions about POS hardware during the same time they evaluate various POS software options. That is why a software or services firm that is offering the solution under a SaaS model would have a competitive advantage if they included the hardware as part of the service. The retailer would find this compelling.

Obviously, the manufacturer of the POS hardware must be willing to offer terms that met the SaaS model.

POS – MONTHLY RENTAL

Even if the retailer is not making a software change, there are many examples of why POS might be acquired on a monthly basis based on business demand. Retailers certainly wish to schedule employees based on customer traffic, why not schedule POS hardware the same way?

It is common to see POS devices that are not being used much of the time in big box stores, department stores, and grocery chains. The retailer would benefit it they did not need to purchase POS devices for the entire year and could only obtain them on a monthly basis.

Holiday peak load, vacation store locations with seasonal traffic, and Christmas kiosks in the shopping malls are classic examples of how POS hardware obtained on a monthly basis would benefit the retailer.

New Store Openings are usually opened with a fan fare and peak volumes. Sidewalk sales or tent sales usually require additional temporary hardware. Renting POS hardware to meet this temporary demand is justified.

There is also a need for temporary POS equipment for industry shows, trade events, conventions, and sales events. This demand may apply more towards software vendors that need POS hardware at these events, but retailers may also occasionally have these requirements as well.

POS RENTAL – A MANUFACTURERS VIEW

There needs to be business value for a POS manufacturer to offer its products on an on demand model. Often it may make more sense for a retailer to purchase the equipment. If the function and application will meet the needs of the retailer for a predictable period of time, lets say 5 years, it makes more sense to purchase the hardware.

The ideal manufacturer would offer both a purchase and a rental or lease option, with some of the rental or lease dollars credited towards purchase price. This approach is a win / win situation for both parties.

If the manufacturer also provides other hardware services, such as custom consolidation, software configurations, site preparation, cabling, rollouts, removing old hardware, warranty, maintenance, and used equipment sales, the rental model is an additional offering in the total hardware services portfolio.

In addition, the rental pricing could be very attractive to the retailer since the manufacturer can take residual value on the equipment and continue to realize its investment after the rental period in secondary markets.

POS - HARDWARE AS A SERVICE - SUMMARY

There is no doubt that 2008 will go down in history as a year that things changed. The financial crisis, the stock market crash, the mortgage crisis, the political landscape change, higher unemployment rates, and the hit that all of these take on consumer spending.

But out of these changes, opportunities emerge. When a vendor can come up with a new idea that solves a business problem for a retailer, then it's the new approach that gets us back on track. It is an understanding of doing things in a better way that makes life easier for the retailer.

In the retail business, there are good times and bad times. There are busy periods and slow periods. There are always new competitive forces that change business strategies and directions. There are life style changes such as the internet that put the power of consumer back in the hands of consumers. Change is the only certain thing about retail.

The "on demand" model for IT services, including POS hardware makes sense.