

IBM i

Migrate from Batch Barcoding to Real-Time

Real-time, mobile and native IBM i barcoding for enterprise process improvements



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The benefits to move to real-time and native IBM i barcoding for enterprise process improvements

“If it isn’t broken, don’t fix it”

Traditional batch processing has been the mainstay solution for enterprise barcoding for many years. It’s a process that works and provided a significant upgrade on manual data collection methods. Like the upgrade from manual to batch, when it comes to real-time processing, it isn’t a matter of fixing a process that isn’t broken – it is a matter of maximizing productivity and improving efficiencies to reduce costs and improve profitability.

The benefits of wireless mobility solutions are widely recognised. The WLANA (Wireless LAN Alliance) conducted a study conducted to identify the cost of ownership as well as tangible and intangible benefits gained from wireless LAN technology. They found that:

- 92% of the respondents reported a definite economic and business benefit after installation of a WLAN
- 92% will continue to deploy wireless technology throughout the enterprise due to the benefits experienced

All respondents in all industries (manufacturing, retail, financial, healthcare and education) reported a return on investment (ROI) in less than one year.

Today, Wireless Local Area Network (WLAN) are widely adopted and cost effective to implement. As such, the barriers to migrate from batch to real-time data processing have been removed. But why should a business migrate and what are the benefits of upgrading to a real-time mobility solution?

This White Paper explores these issues, investigates the cost benefits of migration and suggests a way forward for the IBM i enterprise.



Considerations

When consider migration from batch to real-time processing, companies usually assess a single process. However, the challenge is to view the entire enterprise to understand how a solution in one area of the business can actually serve many areas without a large incremental cost.

Understand your current processes and their associated costs. Measure the time it takes for procedures to run and the personnel involved to complete this. Only when we fully understand current productivity and costs can we forecast the gains we're likely to see should we adopt a real-time process.

Remember that with any new system, new hardware may be required. Ask your vendor for an on-site survey so you fully understand what you require, from WiFi access points to routers. In addition, the migration review should also cover handheld devices. Migration offers the opportunity to add intelligence and 'at point of transaction' decisions to the process. Invariably, add this options adds to the migration costs but could provide a greater return on investment through improved productivity, better and more accurate decision making and greater visibility.

Abandoning Batch Processing

With batch processing, mobile users collect data via handheld computers and bar code scanning devices that are not connected to the LAN either physically, or through a wireless connection. The collected data remains in the device memory until a user connects the device via a cable to a PC and uploads the information to a server.

A business utilising batch processing is always running behind, with access to information from the last set of synchronised data. The business may only ever see a picture of 'the state of play' at the end of each shift, by which time the data the business needs to act on may be already out of date.

In addition to device management and labour costs (see next page), information isn't readily visible to the business. As such, batch processing becomes a hindrance when investigating more modern business systems including lean manufacturing, JIT processing and real-time Business Intelligence.



Time for always on-line

When information is stored on a server and transmitted wirelessly, data is not only processed in real-time, but instantly available to other business systems. Real-time data processing is ideal for mission critical information where visibility is paramount to making better and more accurate decisions.

While batch processing collects data to the device for later synchronisation, real-time processing enables instantaneous visibility of data from the point of capture to the point of most impact. As such, the time delays associated with batch processing are immediately eliminated. Data is no longer stored in mobile devices and as it's stored on the server in real-time, data is instantly visible throughout the enterprise. We remove human error from the equation with immediate feedback from the transaction and point of process. This creates an up-surge in scan accuracy. We can also increase productivity through terminal messaging, sequenced pick and put away procedures and paperless picking and receiving.

The result is more timely information — enabling better business decision making, the introduction of lean processes and more accurate processing. Benefits of real-time processing include:

- Inventory requirements can be reduced, lowering associated capital expenditures and increasing stock turns.
- Orders can be filled quickly and more accurately, increasing customer service, satisfaction and retention levels.
- Real-time inventory enables lean and just-in-time manufacturing.
- Up-to-the-minute information ensures an accurate picture of inventory enabling stronger Management of monthly revenues and profitability.
- More accurate processing of invoices through instant visibility of shipments.



The costs to change add up!

To help understand how migration can have a positive impact on the enterprise, let's compare the enterprise costs between the two process types:

Process	Batch Mode	Real-Time Wireless
Device Management costs	Time must be spent before each shift to synchronise data via cradle or docking port. This single administrative task costs a great deal of lost productivity.	Data is processed at point of transaction resulting in zero device down time other than the need to charge the unit.
Lost Data costs	Data is stored on the device itself. Should the device be damaged for any reason and data cannot be recovered, all work must be repeated to recapture the data.	As data is processed in real-time and stored on the server, no processing would have to be replicated should the device go down.
Labour costs	Each day, staff require additional time to walk to and from a PC to dock the device to synchronise data and resolve any issues that may occur during synchronisation. A staff of ten employees could easily spend ten minutes each per hour just uploading information—translating into a full workweek (40+ hours).	No synchronisation is required as information is processed in real-time. As such, the enterprise can reclaim over 40+ hours in labour time costs per week against its batch counterpart.
Inventory Costs	With batch processing, only a 'last-best' understanding of inventory is maintained. As such, the enterprise requires more inventory to offset shift patterns.	Inventory requirements can be reduced and lean/JIT manufacturing enabled, lowering associated capital expenditures and increasing stock turns.



Mobility

Without the limitations of a cable, wireless scanners are battery-operated and can transmit at a greater distance. In places where mobility and barcode scanning are needed a wireless barcode scanner can be a great asset. Without the tether and limited distance, users are not restricted to operating within a short distance. By working at farther distances, operators can increase their productivity, scanning range, and ultimately the number of items processed.

Divisive Devices?

A migration from batch to real-time processing should provide an opportunity to review your current barcode capture technology. Luckily, there are a plethora of wireless devices to choose from that range in capability and cost. Choosing the device right for your enterprise depends greatly on what the scanner will be used for. The answer to this question will determine the technology needed to provide the best and most efficient result.

Laser based barcode scanners are well suited in environments such as manufacturing and warehousing due to their long scanning distance and quick image identification. On the other hand, if it is being used in close quartered or extreme environments, such as outdoors or in very hot or very cold environments, an image scanner is often chosen because of its durability.

In addition, considerations should be made for the usability and usefulness of the device. For example, devices with a display can provide visual clues for items to be picked or suggest alternative items. A touch screen can provide choices and interaction with real-time messaging and analytics possible too.

Finally, and really quite obviously, choose a scanner that is compatible with the symbologies in your barcode. If you are unsure, ask these questions of your requirements:

- Where will the scanner be used? Is it a rugged environment?
- Do I need to interact with the data?
- Have you selected software/service to use on the mobile device
- What kind of barcodes will you be reading?

The table below details the different wireless mobile device types and their application:

Application	Basic	Phone-size	Full-size	Gun-grip	Wear-able	Fixed
Inventory (Cycle Counting)	●					
Inventory Management		●	●	●		
Asset Tracking		●	●			
Warehousing			●	●		●
Pick-and-Play			●	●	●	
Attendance Tracking	●	●				
Field Services		●	●			
Shipping/Receiving				●	●	●
DSD/Route Accounting		●	●			
Work in Progress (WIP)			●	●		
Healthcare (Point of Care)		●				



The Software Conundrum

Just as important as your choices for mobile scanner and barcoding infrastructure is the software you implement to manage the system. There are many considerations including if the application itself should be native to the device operating system, browser (server) based or mixed mode.

Below are detailed considerations for each option:

Operating System	Advantages	Disadvantages
Software Native to Device OS	Can be tailored for specific device and task in question. Excellent where no WAN is available.	Expensive multi OS support. Difficult to update and maintain versions.
Server (Browser) Based	True real-time interaction with server. Light on handheld resource. Compatible with all devices that supports a browser.	Requires complete network access.
Mix Mode	Good for mobile environments where network access isn't a constant. Data can be saved to the device.	Added layer of complexity including synchronisation issues between application and server. More expensive to roll-out. Additional support costs.

With the advent of improved Wi-Fi and WAN technologies, the most cost effective and efficient solution would be a Server Based solution. One installation on the server will provide the entire workforce with the solution they require while upgrades and service changes can be completed with minor torment; ideal for fast moving businesses and/or IT teams with stretched resource.

The key to a successful server based implementation is ensuring total network coverage. To complete this, your Barcode partner should provide you with a site-survey that is backed by a service level agreement on installation.

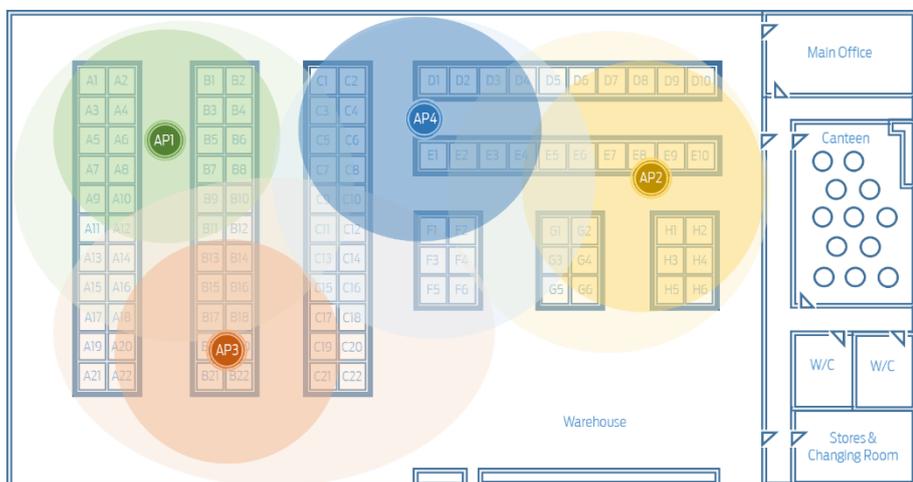


The Wireless Infrastructure

Providing both the business and its employees with the real-time data and tools they need at point of action greatly improves productivity. However, to facilitate this process, a robust wireless network should be available and enjoy adequate coverage where necessary.

While most people have a wireless network at home, these technologies would not be able to support a modern business. For enterprise level performance you need a robust and capable network that can accommodate large amounts of concurrent users without network drop-out.

The core components to any wireless infrastructure are access points (AP) and wireless switches. APs are the devices that will transmit and receive all your wireless information from servers to users. These will be strategically placed throughout your facility to create the best coverage. Wireless switches are the devices that all your APs will connect to for easy management of your wireless network.



(Fig 1 – Access Point Configuration Example)

As detailed within fig 1, your site survey will decide how many of APs you require and strategic placement of each to minimise interference and maximise signal strength.

To best prepare for the survey, be pre-armed with the answers to the following questions:

- How many concurrent wireless users will you have?
- How large is your facility and do you need coverage throughout?
- Do you have existing access points in place?
- Is there machinery/infrastructure that could cause ‘black-spots’?
- Will you need coverage indoors, outdoors or both?
- Will you require guest users on your network?



Putting the Pieces Together

With the RF survey complete and a view for wireless connectivity proven as the enabling source of real-time barcoding, consideration has to be taken into account for the back-end architecture your business utilises.

By utilising the IBM i, your business has seen many advantages through its robust transaction prowess, reliability and uptime. At the very least, these attributes should be cornerstone of your real-time barcoding set-up. As such, and to avoid unnecessary layers of complication, your barcoding solution should be IBM i centric.

5250 emulation via your handheld scanner is possible but impractical for a fluid user experience. The user interface for the barcoding solution should be graphical and provide the appropriate touch facilities for stylus, finger and glove depending upon requirement. Ideally, this should be provided via common browser technologies to provide the widest possible compatibility over a range of devices and operating systems.

Solutions such as [ShowMe Barcode](#) by Utilities 400 provide these real-time facilities but add live analytics, full validation services and one enterprise license.

Utilising solutions like ShowMe marry your existing IBM i systems with appropriate handheld technology with real-time transactions AND analytics.

The benefits of using real-time barcoding solutions appear in many areas:

- Support warehouse operation with an improvement in accuracy of 99+% achievable
- Remove manual errors and the associated time and labour needed to resolve them
- Free up workers and reduce the paperwork needed to manage assets and shipments
- Enjoy better data collation and automation with real-time visibility and analytics

Using applications such as these provides business the opportunity to reduce errors and make huge gains in efficiency. These solutions work in parallel with your ERP providing appropriate information and instruction to the barcode operative while providing fully validated, live reading and writing to your IBM i.

Such solutions provide the facility to enable businesses on IBM i to migrate from batch processing to real-time transactions.



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