

The Bar Coding 101 Guide: What You Need to Know




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Today's businesses have a sharp focus on providing enhanced value to customers and reducing costs. Often, these priorities seem to be at odds with one another. How can you increase value while cutting expenses? Most attempts at improving the quality of your products or services result in increased costs, either through adding or reallocating employees or acquiring and integrating expensive hardware or software that may or may not yield the expected return on investment.

To compound the issue, value is measured less frequently by comparing just one company to another. More often the measure of a company's value comes from comparing supply chain to supply chain. Any supply chain is only as productive as its weakest link, and as customers and suppliers are faced with the same challenges, those partners who are unable to meet their minimum requirements may find themselves left out in the cold.

So how does a company enhance its value to its partners while also reducing expenses?

The ability to capture and share valuable data is the lifeblood of organizations. Those who do it accurately and efficiently can remain competitive. Those who are able to take it to the next level by creating operational efficiencies throughout their organizations can achieve a significant competitive advantage.

Bar code systems and related automated technologies present a proven method to capture and share important data, both within an organization and throughout the supply chain. We've prepared this guide to show you how to realize the potential of bar coding and related technologies, including:

- Reducing cost and improving operational efficiencies in receiving, production tracking, quality control, shipping order tracking operations
- Enhancing the value of the organization in the supply chain to strengthen customer loyalty
- Increasing the return on investment (ROI) of new or existing enterprise software applications

Reduce Labor Costs


Too often, when faced with inefficiencies in an organization, companies incur additional expense by adding employees to overcome bottlenecks. This is commonly referred to as "throwing bodies at the problem," and while more staff can increase output, the additional employees also boost your payroll costs. Like a bandage, this move usually masks the real issue but doesn't present a realistic solution.

Data collection and management within an organization is no exception. When faced with the requirement of capturing even basic data such as part numbers and serial numbers for shipments so they may be included on shipping labels, packing slips or invoices, you've got two options:

1. Dedicate a resource to this task, or
2. Use available and affordable technology to efficiently and accurately capture the information.

Here's where bar code scanning comes in.

Capturing data using a bar code scanner saves time (and the associated labor costs) and is far more accurate than the manual keying of information. When recording the item's part number and serial number, scanning a bar code takes only a few seconds, while manually recording the same information character-by-character may take minutes. Seconds versus minutes? It doesn't sound like much but multiply that time by the number of items handled by an organization during the course of a day, and those minutes begin to pile up. Minutes become hours and suddenly your payroll is leaking ROI.



Even skilled typists will make approximately one error for every 300 keystrokes. If item numbers consist of 10 characters, that means that one out of every 30 part numbers will be captured incorrectly. If serial numbers are also being captured, the error rate could be one out of every 15 items that are entered with either an incorrect part number or serial number.

Even a simple transposed digit can result in a drain on resources and create additional expense for the organization. Since this information is likely being consumed by the enterprise resource planning (ERP) and customer relationship management (CRM) packages, the cost of such errors can be significant, affecting inventory and order tracking systems. By reducing the occurrence of such errors bar code scanning saves additional labor costs beyond those incurred through the entry of the data.

With today's high-resolution printers, bar codes are printed with razor-sharp detail. As a result, scanning a bar code produces greater than 99.9 percent data accuracy.

Reduce Inventory Requirements

Managing inventory requires a delicate balancing act between controlling cost of goods to avoid excess inventory and ensuring that sufficient inventory is available to meet demand. Inventory management systems provide excellent visibility into on-hand and available inventory as well as historical trends to provide managers with the ability to forecast for future demand, but if the data is incomplete or out of date, managing inventory levels becomes far more difficult. Without the ability to accurately forecast, companies are often required to maintain excess inventory, creating unnecessary expense for the organization.

By incorporating bar code technologies into current inventory management processes, the availability of accurate and timely data will enable managers to make informed decisions regarding inventory levels, allowing the company to meet delivery schedules without incurring needless additional expense for the organization. The elimination of excess inventory will not only reduce the expense of the cost of goods, it will improve cash flow by reducing the need for valuable storage space, reducing labor costs, improving asset utilization and enabling faster billing cycles.

Improve ROI for Enterprise Software Applications

In order to manage their operations more effectively, many companies have made enormous investments in enterprise software applications to provide improved visibility into their operations. Companies have invested millions of dollars and significant resources into enterprise resource planning (ERP), customer relationship management (CRM) and supply chain management (SCM) systems, only to have these investments undermined by inaccurate or incomplete data.

When optimized, these systems can pay substantial dividends over time, providing invaluable information and intelligence about their products, inventory management, order tracking, customer buying trends, return and repair rates and countless other benefits. However, all of these potential advantages depend on populating these systems with reliable and timely data.

In order to ease the integration of bar code systems with existing enterprise software applications, label generation and management software uses open technology that interface with the most popular enterprise applications and platforms including SAP® and select Oracle® applications, as well as with any application that can support XML.

This is why bar codes have endured as the most widely used, effective and efficient tools employed by organizations interested in optimizing their enterprise software systems.



Improve Receiving and Materials Management Processes:

Many of the companies who have benefited most from the integration of bar coding into their operation have discovered that they reap the greatest benefit by incorporating the technology as far upstream in their process as possible. Initiating the identification and tracking process at the receiving dock, the first point of contact with most products, will yield significant advantages downstream.

For many companies, shipping labels may not provide sufficient information for tracking products once they are received and entered into inventory. To address this issue, a strategically located bar code printer designed for use in an industrial environment enables warehouse employees to quickly and easily print and affix a label. Once the label is in place, a quick scan records its arrival and updates the inventory management system.

Inventory systems will generally provide routing instructions, including the warehouse stocking (or bin) location for every item that will travel through the warehouse. The initial scan of the item at the receiving dock provides the user with an exact location where the item is to be delivered, either to a predetermined bin location or even directly to the assembly line. Once the product is moved to its intended location, scanning the bar code affixed to the shelf will update the inventory management system to reflect the arrival of the product and confirm its exact location. This step enables efficient locating and picking of the item when it is needed.

By incorporating bar codes into the receiving process, companies can recognize significant improvement in internal tracking of items, and improved efficiency and reduced labor costs for warehouse personnel.

Implement Build-to-Order Processes:


Following on the heels of success by companies like Dell Computer, the demands of customers for custom-configured products has required many suppliers to move to a build-to-order (BTO) model and just-in-time (JIT) inventory methodology. This model depends upon the ability to provide tracking and control at the component level, some of which are so small that they were previously considered untraceable.

Further, moving to a build-to-order process requires an organization to adopt flexible manufacturing processes, improved work-in-process (WIP) tracking and more frequent, smaller shipments. Finally, the ERP must be able to associate each component with a specific customer order. All of these requirements can be satisfied using bar code technology.

With today's high-resolution printers, bar codes can now be printed onto components smaller than a postage stamp. With the standardization of two-dimensional bar code symbologies (like Data Matrix and UltraCode), these tiny labels can include a significant amount of valuable information, including item numbers, serial numbers, lot codes, operator ID, and date and time of production.

The use of piggyback labels attached to WIP tickets is one method that has been successfully employed to improve work-in-process tracking as well as quality control. Piggyback labels consist of a single sheet that contains numerous smaller labels to custom label each component with matching serial numbers. Removing the appropriate label from the attached sheet and applying it to the matching component as it is added to the assembly ensures that each item is configured with the correct components and provides improved lot tracking and quality control downstream.

The benefits of lot tracking are considerable. For example, a company that identifies a problem with a defective component can use this information to identify the supplier of the defective item and the location of other components from the same lot that



may also be suspect. As a result, it can determine exactly which products might have been shipped that contain the potentially defective component, regardless of the configuration and address the issue with only the affected customers. Without this level of tracking, it would be nearly impossible to determine which customers might have received defective shipments, resulting in a broad, and potentially damaging, recall.

Incorporate RFID

An alternative to standard bar code labels is a “smart label” which includes an RFID (radio-frequency identification) chip. Unlike bar code labels, which require direct line of sight between the scanner and the label, RFID labels can be read from several feet away with no line of sight to the reader. Using RFID technology, entire pallets can be scanned at once, even if the label is hidden or obscured, in less time than it takes to scan a single bar code shipping label.

The U.S. Department of Defense since 2007 has mandated the use of RFID labels as a condition of any contract that includes the DFARS (Defense Federal Acquisition Regulations Supplement) clause. Vendors that fail to comply with the DFARS clause will find that their status as a vendor will be affected and payment for shipments will be withheld.

RFID tags also provide significant value for inventory systems, providing accurate and immediate on-hand inventory without having to conduct manual counts. For companies that maintain inventory of millions of items at any given time, the availability of this data and the cost savings of obtaining it, justifies the expense of this technology.

Enhance Quality Control

In today’s fast-paced assembly lines, the goal is speed and efficiency. Quality control is critical, but incorporating quality control stations on the assembly line would be counter-productive. Advanced bar code systems provide the answer to maintaining quality control without creating a bottleneck that undermines efficiency of the production process.

As previously stated, two-dimensional bar code symbologies allow the compression of a great deal of information on a tiny label. With today’s high-resolution printers, these labels can be printed with amazing clarity, providing flawless scanning accuracy. A product’s test results can be encoded on the label along with its full production history.

An even more effective solution is achieved through the use of RFID labels. The label is imprinted with a static bar code, but since the RFID chip is rewritable, users along the assembly line and at the quality control station can add new information, including production history and test results. The entire production life of the unit, beginning with the procurement of each component through quality control, can then be accessed with a single scan.

Improve Order Tracking

Customer inquiries for order or shipment status can place a significant demand on resources if the information is not accurate, timely, and easily accessible. Many companies are attempting to reduce the demand on these resources by providing tracking information on self-service, customer-facing Web sites. Regardless of how the information is being accessed, it originates from the



data communicated to the ERP application. By tracking products through the assembly and shipping process, the information that is supplied to either the Web site or the CRM will be updated real-time, providing timely, accurate, and useful information. This results in the efficient use of internal resources (reducing labor costs) and a positive customer experience that increases the company's perceived value and, ideally, increases customer loyalty.

Solve "Physical Access" Issues with Wireless

While bar code systems may provide the perfect solution for process improvement, there may be physical limitations that prevent organizations from installing computer workstations for the purpose of scanning and printing bar codes. For example, many assembly lines do not have the space to accommodate such systems, and some industrial environments are simply unsuitable for the placement of a computer.

Since the latest bar code scanners and printers natively support leading wireless technologies and protocols, physical access is no longer an obstacle, provided a wireless network is available. The computer can be located anywhere on the network, even in a different facility, and a small, dedicated label printer can be strategically located wherever it is needed. Many of those existing bar code printers that lack wireless support can be converted to wireless models by installing a wireless print server.

Reduce Interruptions Through Remote Management

As discussed in this paper, integrating bar code technology into the production process provides considerable benefits that will promote improved operational efficiency and reduced cost. At the same time, as bar code printers become integral components of the production process, any interruption becomes a potential disruption to the flow of materials.

Remote print management tools are capable of alerting system administrators of issues by sending error messages to designated devices including computers, cell phones, or personal organizers. Many of these alerts can be addressed remotely, even from a different facility, without having to interact physically with the printer. These tools also allow administrators to proactively manage the printers to monitor performance, workload, and media use. By providing administrators with both remote management tools and automated alerts, potential downtime and subsequent interruptions to the business are minimized.

Conclusion

Demonstrating their value to their customers and within the supply chain is an ongoing priority for organizations. Many companies make substantial investment in systems and resources, only to fall short when it comes to supplying accurate, timely, and complete data to those systems that will enable them to achieve their full potential and optimal return on investment. Quite often, this is because companies rely on inefficient manual processes for collecting and capturing this data.

Replacing these manual processes with bar code and advanced technologies, like RFID, will enable organizations to capture and track this valuable information efficiently and accurately, creating operational efficiencies that can significantly reduce expenses. Integrating these improvements in receiving, inventory management, work-in-process tracking and shipping processes can provide a considerable competitive advantage.