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## How RFID Spreads Benefits Throughout the Supply Chain

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Much of radio frequency identification (RFID) hype has existed around the possibilities in the retail environment, managing store inventory more effectively, and driving consumer decisions, but RFID also enables accelerated accurate warehouse operations.

As costs associated with RFID tags decrease, manufacturers and distributors will face increased pressure from retail customers as well as competitors to adopt this technology. As with many technologies, RFID can generate disproportionate ROI for early movers relative to those that wait.

RFID is composed of a tag (on the item) and a reader. The tag is composed of a processor and antenna. Tags can be active and use a battery or passive and use power from the reader. The reader can be handheld or stationary and can vary in size and strength based on purpose. Tags can be on hang tags or embedded in items. Items can be given a unique fingerprint to be tracked individually. Primary warehouse benefits are: reading many items simultaneously, doing so without line of sight, and tracking the direction product is moving (e.g., coming off or going on a truck).

RFID can suffer readability issues due to product density, material, or packing alignment. Not all products are ripe for RFID but those that are can experience significant speed advantages in warehouse processing.

While it's true that the majority of RFID ROI comes in the retail environment rather than in the warehouse, the benefits of RFID permeate through the supply chain and can help improve allocation efforts, buy-online-pickup-in-store ability, ship-from-store operations, inventory levels, vendor compliance, and labor spend.

### In the Warehouse

Speed and understanding are the promises of RFID in warehouses and DCs. Inventory accuracy is typically so high that warehouses can't improve much, but they can improve in the speed of process activities and understanding of each process step and each shipment: speed of inbound receiving RFID-enabled product, speed of conducting cycle counts, and speed of outbound processing. The other promise is understanding how an organization can better understand error rates, conduct root-cause analysis, and challenge chargeback rates using RFID scan data.

**Inbound improvements.** With the correct integration and familiarity with RFID products, materials can be offloaded onto a truck, pass through a reader and be received into inventory in a matter of seconds.

**Processing improvements.** Can locate specific individual products, find lost products, and can QC cartons faster.

**Outbound improvements.** Can capture errors at the carton level before assembling pallets and at the pallet level before shipping out the door.

### Other Considerations

**Integrations.** RFID can be integrated with ERP, WMS, WCS, etc. Benefits can be realized with an isolated pilot, but ROI does compound as integrations increase.

**Enabling technology.** RFID functions well as a stand-alone technology, but there are emerging technologies that pair well with RFID, such as blockchain, where RFID events can act as a trigger to begin the process of adding a block or edge computing as RFID can create very large data sets very quickly; therefore, the cost of functioning a fully cloud-based architecture may become prohibitively high.

### The Outlook

RFID will increase in popularity; the price has decreased enough to justify usage, supporting technologies are emerging, and the retail environment is demanding it for the customer experience and revenue improvements that can be realized. However, testing a pilot or implementing a large-scale RFID program is no easy endeavor and must take into consideration the full organizational ecosystem, and it requires buy-in from all levels. The rewards, though, are new capabilities not possible today.

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