

Körber Supply Chain

Evaluating warehouse technology

Comparing voice with paper,
RF scanning, and pick-to-light
solutions



When evaluating picking solutions for your warehouse or distribution center, there are four main options to consider: voice, paper, radio frequency (RF) scanning, and pick-to-light.

Although each of these solutions has its own strengths, and ideal applications, you should consider all of them carefully before investing in a new system. This white paper compares the four solutions and evaluates the benefits that each one will bring to your business so that you can make a better-informed decision regarding your future warehouse technology.

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Evaluating each solution

Paper

Paper-based order picking, or label processing, is the fulfillment of warehouse procedures and tasks using paper systems. Paper picking is usually coupled with after-the-fact manual data entry.

Warehouse workers typically perform tasks while using pick lists, put-away labels, printed “value added services” instructions, and other paper documents. Upstream processes (such as how information is ordered on documents) and downstream processes (such as “scan and verify” on a desktop terminal) directly impact paper/label processing performance and functionality.

For smaller businesses

Paper/label processing is best suited to smaller operations with relatively straightforward transaction requirements and minimal budgets. In addition, operations that rely on RF scanning for the bulk of their transactions usually employ paper/label processing for some functions.

This solution can be a completely manual proposition or part of an automated flow, such as a label case pick-to-belt, where the pick is confirmed by an in-line conveyor scan.

There is very little investment required for a paper picking process, and most of the associated costs are for paper, printers and printer ink.

Paper picking process

When an employee picks with paper (or labels) they use the following process:

1. A list of instructions or a sheet of labels is printed and picked up
2. Read location
3. Navigate to location
4. Check the item to be picked
5. Put down the clipboard/paper
6. Pick the item
7. Pick up the clipboard/paper
8. Cross the item off the pick list (or place the label on the product, if picking with labels)
9. Report back to supervisor who manually enters data into the warehouse management system (WMS)

The end-to-end paper picking system



Radio frequency scanning

RF scanning terminals are a standard solution across a wide range of warehouses and distribution centers, regardless of the size of the operation. This is primarily because they are directly supported by most warehouse management systems.

Organizations running non-RF-enabled legacy fulfillment systems can easily implement data collection software to enable RF scanning.

RF scanning versus paper

RF scanning provides a range of distinct advantages over paper/label processing. It can provide verification that a warehouse worker is in the right location or has picked the correct SKU, via a barcode scan or key entry. Work can be allocated to employees based on their location and the task priority, rather than being handed out from a manually managed queue.

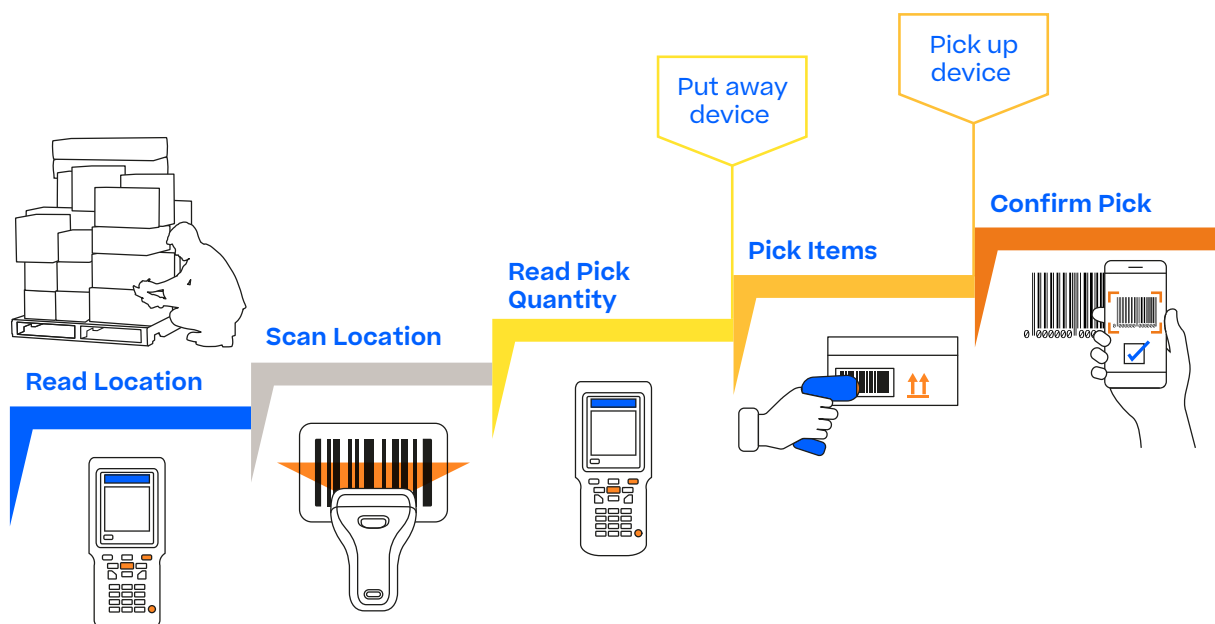
Transaction data is captured in real time as employees perform tasks. In addition, RF scanning makes certain functions, such as multi-order cart selection, possible or more practical than paper/label processing.

RF scanning picking process

When an employee picks with RF scanning, they use the following process:

1. Read the location on the scanner
2. Navigate to location
3. Scan location label
4. Read pick quantity on screen
5. Scan label on product
6. Put down the scanner
7. Pick the item
8. Pick up the scanner
9. Device uploads data into the WMS

The end-to-end RF scanning journey



Evaluating each solution

Pick-to-light

Pick-to-light (PTL) is a popular technology because it supports high pick rates and is easy for warehouse workers to use. It is typically applied within a zone-based pick and pass flow.

First, the warehouse worker scans a tote or carton barcode label. Then the PTL software activates a light display above each product location, which also shows the required quantity needed for the tote or carton.

After walking to his/her assigned zone, the employee can select SKUs and confirm picks by pressing buttons on the LCD screen. Displays can also highlight useful information relating to SKUs, orders, and other relevant data. Some organizations even show SKU pictures on the display screens.

Exclusively used for order selection

PTL technology is focused on the order selection process. Unlike the other solutions covered in this white paper, PTL cannot extend to warehouse functions such as receiving, put-away, and cycle counting. This means that any investment in this technology cannot be leveraged beyond the PTL module and order selection process.

PTL is mainly used by organizations that have a fixed number of SKUs with a high pick volume, as there is considerable cost associated with adding new SKUs. The PTL process is easy to follow and learn for warehouse workers, and can generate significant increases in productivity.

Pick-to-light picking process

When an employee picks with PTL, they use the following process:

1. Workers are assigned zones
2. Navigate to zone
3. Scan tote or carton label
4. Light mounted above product location illuminates
5. Read the quantity needed
6. Pick product
7. Click on the light to confirm pick.

Voice

The main reason that voice technology is used across distribution centers and warehouses is to maximize operational efficiencies.

With the other solutions covered in this white paper, workers need to regularly switch their attention from the task at hand to a piece of paper, screen, or light. But this takes up valuable time and increases the likelihood of error.

Ergonomically efficient

Employees adopt a hands-free and eyes-free approach to working when they use the voice system, which provides spoken instructions via a headset. This enables them to work quickly, safely and efficiently, while increasing productivity and accuracy throughout the warehouse.

Many organizations will also experience a significant reduction in training time, as voice training often only takes as little as an hour to complete.

Additional workflows

Voice is ideally used to support tasks such as order selection, put-away, replenishment and cycle counting in the warehouse, and can also be deployed into many other areas.

Expansion into other workflows is possible because the voice system is directly connected to the WMS or ERP, allowing live updates to be transmitted while workers are on the warehouse floor. This not only helps with inventory management, but also enables supervisors to stay up to date regarding the productivity of their workers at an individual level.

Voice picking process

When an employee picks with voice, they use the following process:

1. Hear the location while navigating to it
2. Reach the location
3. Speak the check digits located at the site
4. Listen to the number of items to be picked
5. Pick the items
6. Verbally confirm the quantity

NB: At step six, the picker has the option to relay any issue at the pick site – such as a shortage of products or damaged items – back to the WMS. If there is a shortage, the picker only needs to say the number they are able to pick. The voice system will ask them to confirm if their mis-pick was due to a shortage, and then the picker can progress to the next location.

Voice interaction

Here is an example of the voice system and picker interaction in that particular scenario:



Comparing voice against all other solutions

Voice versus paper

While paper picking can be an ideal starting point for many smaller organizations, it tends to be a barrier to large-scale growth and improvement.

Whereas voice provides real-time visibility of inventory, employees and systems, paper systems require data to be entered after tasks are completed, which is inefficient and can lead to errors such as incorrect or duplicate data. Paper solutions also rely on printers, and any printer maintenance issues can bring an operation to a standstill.

Paper solutions are time-consuming

Workers burdened with paper handling slow down the processes that are key to efficient warehouse management.

Having to constantly pick up, read, and then put down a clipboard takes the workers' attention away from the task at hand, and can lead to unwanted errors or mis-picks. In fact, many workers using paper systems try to memorize several steps to increase productivity, leading to further mix-ups and inventory issues.

Voice advantages over paper:

- Supervisors gain real-time visibility into what is happening on the warehouse floor
- Live updates on inventory, shortages, and damages are sent to the WMS/ERP system
- Hands and eyes free for greater ergonomic efficiency
- Increased productivity, safety and accuracy
- Cuts down on operational costs associated with paper and ink
- Greener solution



Voice versus RF scanning

Prior to voice, no other technology had a greater impact on the evolution of the WMS than RF scanners, which increase workforce mobility. While they are a popular choice for many companies, RF and barcode scanners do have certain drawbacks.

Training and maintenance issues

Training staff to use RF scanners can be very time-consuming, and it has taken some organizations up to three weeks before workers are self-sufficient. Once fully trained, these workers are still distracted by the scanner, and cannot complete tasks without having to pick the device up and put it down.

In addition, maintenance costs for scanners can be high, especially if workers drop or mishandle them. This can lead to expensive screen or keyboard replacements, and extra equipment to replace badly damaged units.

Fast and efficient alternative

Voice technology enables workers to complete tasks quickly and efficiently. Warehouse staff can adopt a hands and eyes free approach to working, so their attention stays focused on the task at hand.

The voice picking process can also minimize the information exchange required between the picker and the system, which leads to increased picking speed and greater productivity.



Voice advantages over RF scanning:

- Hands and eyes free working
- No struggling to read a screen
- Safer picking with a reduced drop/damage rate
- Up to 35% more productive on average
- Decreased training time—most voice users are up to speed in a few hours
- Up to 25% more accurate on average

Comparing voice against all other solutions

Voice versus pick-to-light picking

Pick-to-light presents challenges that go beyond pick rates and productivity levels. This expensive and complex technology typically requires a significantly larger start-up investment and a relatively rigid product flow. Each new SKU needs its own light system, and any further products added to your system will generate additional costs.

Maintenance

Maintenance cost associated with PTL tend to be higher, because there are more parts that can fail, including buttons, lights, displays, connectors, power supplies, and wiring. All these components require a back-up inventory to ensure continual operations.

If an individual light fails, for example, workers will assume that the product is not being ordered, which could lead to multiple incomplete orders logged until the issue is identified.



Workflow

With PTL, totes and cartons are generally routed between fixed pick zones via a conveyor system. Managing workflow can be an ongoing issue, because of daily workload fluctuations between zones and picker productivity. This can cause bottlenecks in some areas and underutilization in others.

Voice provides greater flexibility when it comes to redeploying resources to meet daily changes in workload on the warehouse floor.

Adjusting the configuration of a pick-to-light module may require additional changes to the light displays, communications system, software, physical storage media and WMS. Conversely, reconfiguring pick modules supported by voice generally only requires changes to the labelling, storage media and WMS. Additionally, expansion with PTL can be costly, with so many components to be purchased and changed.

With voice, costs are driven by number of users rather than SKUs, helping to minimize operational costs.

Voice advantages over PTL:

- Hands and eyes free working – no need to look for lights, read displays or press buttons
- Increased flexibility and significantly lower expansion costs
- Reduction in bottlenecks
- Adaptable for other warehouse activities like receiving, cycle counting, replenishment, loading and put-away
- Ability to track individual worker performance
- Cost per worker rather than per SKU

Conclusion

Although each of these solutions has its merits, voice clearly outperforms all other options. By providing greater levels of productivity, flexibility and accuracy, while reducing costs and training time, voice can empower your warehouse workforce to complete tasks in a more ergonomic and efficient way.

You'll find that your employees prefer using voice technology because it's so simple and intuitive. In addition, if your warehouse workers receive clear step-by-step instructions, they will be less likely to make mistakes, which will further reduce the costs to your organization.

For more information

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