Order fulfillment optimization
When to make the move from paper picking to paperless
For the fulfillment operation currently using manual paper picking, the question inevitably arises - when is the right time to make the move from manual paper picking to paperless picking, such as pick-to-light or voice picking, and what can we expect if and when we make the move? This white paper outlines the factors to consider, the benefits of current automated picking technologies available and reviews some of the efficiency improvements and ROI these technologies can bring to an operation.

Business as usual: a review of some of today’s fulfillment challenges

Today’s distribution center manager faces a host of challenges. Some come with the territory and some are expected, and unexpected, consequences of the global economy. These business and economic pressures stand between a DC manager and his or her goal of achieving increased productivity and higher accuracy.

Accuracy is another order fulfillment driver that will never go away. For some businesses, such as pharmaceutical companies, accuracy trumps everything else in the DC. Regardless of product, ensuring an accurate pick, check and pack is paramount when accurate fulfillment can build a loyal client base – and when mistakes can cost a company valuable customers.

Some of the newer challenges that have really come on strong in the past few years are the need to accommodate non-native English speakers in the labor pool, and the need for increased flexibility to adapt to the ups and downs of growth, economic influences and increased seasonal demand curves.

Finally, the increased use of sophisticated business management software, from ERP systems to business intelligence applications, is driving more automation into the DC - ensuring higher management visibility of this part of the supply chain.
To meet these challenges, more and more DC managers are looking to automated order fulfillment solutions including pick-to-light and pick-to-voice. But where is the best place to start, and what should be considered in making the move?

Start where you are

The old adage “How can you get where you want to go if you don’t know where you are?” certainly applies to assessing the viability of moving from manual to automated fulfillment. The best place to start is with a thorough analysis of the current DC operation. This would include at least six months of data for non-seasonal operations, and at least 12 months for operations with a seasonal component. Most sophisticated automated material handling integrators have detailed operational analysis questionnaires they can assist the DC management in completing. The data from these surveys will generally point out a clear direction for the most appropriate technology and systems. Typical information sought will include:

- Location data (racks, shelving, number of SKUs, etc)
- Labor data (number of shifts, number of pickers, checkers and packers)
- Costs (labor and returns)
- Current pick methods
- Typical order profile (number of orders, lines, pieces, shipping data, error rates, error costs)
- WMS or other software in place
- Key issues faced

After having completed the survey with a provider, the DC manager will have established a baseline as well as identified weaknesses and areas where automated solutions may produce an ROI.

Setting the bar: what to expect from automated fulfillment

When committing to an investment in new technology, it is important to know exactly what to expect in ROI, both in hard numbers as well as any subjective benefits. Common ground when calculating ROI includes productivity and accuracy, while additional benefits include flexibility, management insight and WMS integration.
Calculating return on investment (ROI): productivity and accuracy

Determining an estimated return on investment is crucial to any operation considering a shift from manual picking to a paperless picking solution. A simple method to calculate ROI begins by validating where the operation is today, and an example of a company moving from a paper-based to a paperless picking solution has been provided.

Productivity gain ROI

Many companies are looking towards increasing efficiency to keep costs under control. When making the move from paper to pick-to-light, companies can realize up to 50 percent or higher productivity rates; those companies that move from paper to RF or voice achieve around 25 percent increases. With software to monitor productivity of workers on an individual or zone basis, automated fulfillment technologies provide a host of management options that are buried in a paper picking and reporting system, including workforce right-sizing, shift structuring and getting more out of an existing facility. If there is an increased demand in the DC, the cost of applying automation to increase productivity may turn out to have a higher ROI than adding an additional costly labor shift.

To estimate the ROI from the increased productivity provided by a paperless picking solution, the first step is to determine the operation’s current total number of order fillers and their associated salaries. Multiply these numbers by 2,080 (the total hours in a year). In the example below the total wages per year is $374,400. As discussed earlier, an investment in a paperless picking solution can increase productivity by 25 to 50 percent. At a 30 percent gain in productivity the example below provides a reduction of labor cost of $112,320. This results in a reduction of labor or increased volume.

Figure 1 - Example productivity gain ROI calculation

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<table>
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<tbody>
<tr>
<td><strong>Current Cost</strong></td>
<td></td>
</tr>
<tr>
<td>Total Order Fillers</td>
<td>6</td>
</tr>
<tr>
<td>Avg. Hours/Year</td>
<td>2,080</td>
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<tr>
<td>Wage/Hour (w/ Benefits)</td>
<td>$30.00</td>
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<tr>
<td>Total Fulfillment Labor Hours/Year</td>
<td>12,480</td>
</tr>
<tr>
<td>Total Wages/Year</td>
<td>$374,400</td>
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<tr>
<td><strong>Gain</strong></td>
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<tr>
<td>Productivity Increase</td>
<td>30%</td>
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<tr>
<td>Annual Labor Hours Saved</td>
<td>3,744</td>
</tr>
<tr>
<td>Annual Labor Dollars Saved</td>
<td>$112,320</td>
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</tbody>
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Choices, choices, choices: an overview of today’s automated pick and put technologies

Pick-to-Light was developed approximately 30 years ago, and provides the most efficient picking solution for high speed order fulfillment. Based on the use of colored lights to inform the picker of both the pick slot and the quantity, pick-to-light has enabled the development of a multitude of modern order fulfillment processes, including cluster picking, bucket brigade, and dynamic slotting. Pick-to-light has also enabled the development of sophisticated picking algorithms, ensuring reduced walk times and the accommodation of hot picks. Pick-to-light order fulfillment systems routinely provide a sophisticated management window into all DC activities, integrating with existing WMS, ERP or legacy software systems to give the DC manager a clear and real-time picture of the total operation. 

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Accuracy gain ROI
Accuracy plays a huge role in DC success metrics. Accurate fill rates not only result in high customer satisfaction, but also in reduced cost of returns. And, as previously discussed, for businesses such as pharmaceutical, the issue of accurate fulfillment forms the foundation of success for the entire company. With changing labor needs, the issue of how long it takes to train accurate and productive pickers is always an issue. Add nonnative English speakers to the labor mix and effective training can develop into one of the highest stress areas of the DC. With pick-to-light and pick-to-voice, training time can be cut from days to minutes, with accuracy rates approaching 100 percent.

Based on the 30 percent increase in productivity used in the example above, the total number of order fillers required for this example is reduced from six to four, and the total number of order filler lines per hour is increased from 250 to 325. This increase in productivity is reflected in Figure 2.

To estimate the ROI realized from the increase in accuracy provided by fulfillment technology, first determine the current accuracy rate, the cost of a selection error, and the current number of errors occurring per day. Multiply these numbers through and the result is the cost of the errors generated by the current fulfillment process. In the example below, the estimated error cost per year is $38,880. Fulfillment technology implementation will result in an accuracy increase of .05 percent or greater, with some accuracy rates improving as much as 10 percent. An increase in accuracy by as little as .05 percent results in an annual cost savings of $22,032.

**Total estimated ROI**
Based on these calculations, the combined ROI from the implementation of a paperless picking solution for this example operation is $134,352. This represents an ROI in only one year for most fulfillment systems with six order fillers.

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**Put-to-light** is sometimes referred to as pick-to-light in reverse. Just as a pick-to-light system directs pickers to the correct bin to pick an item, put-to-light systems direct the picker towards the right bin or slot into which to place an item. Chiefly applied in systems where batch picked items require sorting into individual orders, put-to-light brings the same benefits of increased productivity and accuracy over manual sorting and packing. By replacing pick tickets, shipping lists and other paper-based manifests, a put-to-light operator has to simply scan a product bar code to be instantly informed of exactly where to place that item. - continues on next page
Other determining factors which will add to the operation’s ROI are simplified training, reduced cost of consumables (labels, pick lists) and reduced support staff required. In addition, the operation will benefit from the flexibility, real-time management and reports provided by an automated picking solution, as well as the solution’s ability to integrate with an existing WMS.

Other benefits of an automated solution:

Flexibility
Dynamic demand curves, seasonality and projected growth figures are often cited as reasons for replacing a paper-based pick system with pick-to-light. Automated systems can accommodate hot or accelerated orders, which can be a significant challenge to cope with in a paper pick environment.

In areas where high turnover presents staffing challenges, automation brings some real benefits to the table. If a skilled team is reduced in size due to slow orders or an economic downturn, the DC manager may later be faced with rehiring from a potentially unskilled labor pool once demand returns. Depending upon the availability of skilled labor and turnover rates, an investment in advanced picking technology can prove to have a higher ROI than extended training and additional quality positions. The ability to maintain flexibility in the labor force, whatever the turnover, is a challenge that advanced picking technology can help solve.

Management insight
Today’s pick-to-light systems bring real-time, total labor force transparency to the DC manager. Labor location, pick rates and accuracy rates are available 24/7 via virtually any type of digital display device, from handheld PDAs to smart phones to laptops. Wherever management is located, even offsite, the efficiency and productivity of the DC workforce is instantly available.

Voice picking provides clear and concise voice commands via a wireless network. Providing a cost-effective alternative and/or additional technology, voice-picking eliminates many of the inefficiencies associated with paper pick lists, while increasing picking velocity, accuracy rates and overall productivity. An additional benefit is the ability of the voice commands to be programmed in non-English languages, greatly decreasing the training requirements for the DC operator. In some applications, voice picking may be used in addition to pick-to-light, with both applications integrated into the system via the order fulfillment software.

RF pick-to-cart solutions are ideal for low velocity and distant breakpack locations. Designed to allow batch or cluster picking of multiple orders of items that can traditionally slow picking and introduce high levels of error, cart picking combines elements of pick-to-light and RF scanning technology into a single platform. Ideal for picking large numbers of slow moving items, pick-to-cart system include the same level of integration with the order fulfillment software for real-time communication and reporting.
With senior management demanding increased levels of data from every aspect of the enterprise, management dashboards must be populated with accurate, real-time data. With paper-based systems, this requirement cannot be met. By moving to an automated order fulfillment solution, the DC manager not only has real-time insight for optimal management, but can also provide senior management with the necessary integration into corporate data systems.

WMS interface
One of the key advantages experienced when moving from paper to pick-to-light or other automated order fulfillment solutions is the ability to integrate with the WMS, ERP or other legacy management applications.

Giving the green light to a paperless picking solution
Every company, DC, geographic location, labor pool and industry faces unique challenges that may be unlike any other. Certain circumstances are shared by those considering a move from paper-based manual picking to pick-to-light or other automated paperless picking systems. These can include company growth, concerns regarding labor turnover, a growing demand for increased productivity and accuracy, or a need for a higher degree of real-time management insight. Working with an automated material handling integrator and developing a performance baseline is the first step towards an automated solution. Thorough analysis of the current demands over the past six to 12 months, and projected future requirements of the next three to five years, provides a firm foundation for developing the ideal automated solution, and is the key to an ultimately successful implementation.

For more information, contact Intelligrated® by email at info@intelligrated.com, by phone at 866.936.7300, or visit www.intelligrated.com.