

VOICE IS THE BEST TECHNOLOGY FOR PICKING & PUTTING (EXCEPT WHEN IT'S NOT)

Voice technology is hot. Voice is selling so well that a recently published report, 'Automatic Speech Recognition Applications Market 2010-2013', suggests that the global market for voice applications will grow to US\$933 million by 2013, with growth of 15% between 2010 and 2013. Furthermore, some voice vendors claim that voice solutions will supplant light-driven picking and putting solutions, which similarly began penetrating the industry 20-25 years ago. Are they right?

Lights or Voice?

Providers of voice-directed picking and putting technology claim that voice is the best solution because it improves productivity and accuracy for a reasonably low investment. On the other hand, providers of light-directed picking and putting technology explain that light technology is the best solution because it improves accuracy to the same degree as voice but increases productivity to a much greater degree. Both sides are correct. Sometimes.

Voice and light solutions are each "best" only in certain circumstances, at least when "best" is measured by productivity improvements and investment costs. Fortunately, it is relatively easy to identify in which circumstances (a) voice requires less investment than lights and improves productivity to almost the same degree, (b) lights require less investment than voice and increase productivity to a much higher degree and (c) a hybrid of voice and lights, driven from a common software application, provide the best blend of investment and productivity improvements.

This white paper describes the circumstances in which voice or lights are "best" from the standpoint of productivity and investment costs. Picking and putting are collectively referred to hereafter as "reaching" and picks and puts are collectively referred to hereafter as "reaches".

Break Down of Picking Errors from Paper.

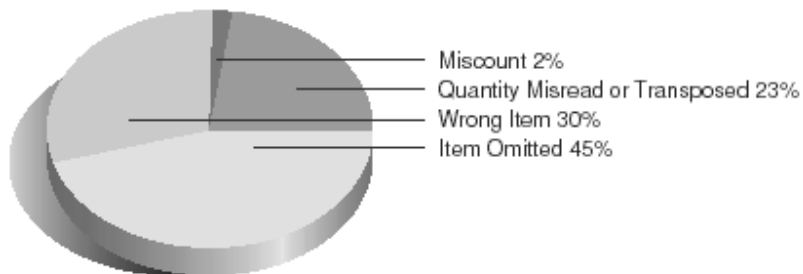


Figure 1

Break Down of Picking Time from Paper.

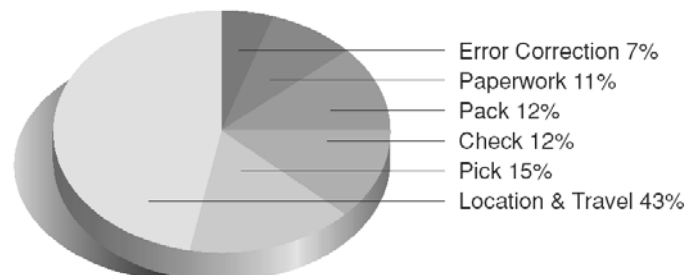


Figure 2



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Why Paperless Beats Paper

First, let us compare paperless reaching, which includes voice and lights, to paper-based (or manual) reaching. In Figure 1 you can see a typical breakdown of picking errors, which can be completely eliminated from going to a paperless solution, keeping the operators hands-free and focused on the order tasks. As you can see from Figure 2, Error Correction, Assembling Paperwork and Checking amounts to 30% of lost productivity from paper, which can also be eliminated immediately with paperless. Furthermore, the 43% of lost productivity from searching for locations can be reduced significantly, with over 80-90% reduction depending on the application.

There are tremendous benefits to paperless reaching, including nearly 100% accuracy, increased productivity, elimination of redundant functions, and the ability to monitor and optimize labor real-time. Paperless reaching systems typically require an investment in a base order fulfillment software application that takes order data from a WMS or ERP system, to drive hardware devices (lights or voice) and to direct operators to fulfill orders in an optimized fashion.

Which is Best?

Case study data for light and voice solutions deployed in distribution centers over the past several years indicates that in some circumstances, voice provides the best blend of investment and productivity improvements, while in other circumstances lights deliver a better return. Because both lights and voice produce nearly 100% reaching accuracy, investment costs and productivity are the two main variables to consider when choosing between lights and voice. Thus, the key factor in determining which circumstances are better for voice or lights depends on the "reach density" of the order fulfillment environment.

How Voice Works?

- ✓ **Audible** Instructions
- ✓ **Spoken** Confirmation
- ✓ **Sequential** Transactions
- ✓ **Investment** Based on # of **Operators** (Not Locations)
- ✓ Best in **Low Reach Density**

How Lights Work?

- ✓ **Visual** (Light-Directed) Instructions
- ✓ **Button-Push** Confirmation
- ✓ **Simultaneous** Transactions
- ✓ **Investment** Based on # of **Locations** (Not Operators)
- ✓ Best in **High Reach Density**

Reach Density – Low or High

Low Reach Density means few reaches per unit of travel and normally occurs when there are a large number of rarely picked from (or put to) locations. "Slow Movers" are typically found in Low Reach Density environments.

High Reach Density means many reaches per unit of travel and normally occurs when there are a small number of frequently picked from (or put to) locations. "Fast Movers" are typically found in High Reach Density environments.

Determining the reach density is key in the analysis for voice or lights, as it will help you compare reaches per hour productivity gains against the investment costs



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Low Reach Density: When Voice is much less expensive

In operations with Low Reach Density, there tends to be more travel (which is non-productive for reaching) between reaches and productivity is minimally impaired by the sequential nature of voice-directed transactions and the time required for audible instructions and spoken confirmations. Thus, in Low Reach Density voice requires much less investment than lights because of the small number of operators to equip with devices as compared to the high cost of hardware and installation of lights at a large number of SKU locations.

Examples of Low Reach Density operations in distribution centers include (a) slow-moving SKUs of piece picking operations from flow rack and (b) full case picking operations from pallet rack. In either example, a relatively small number of operators cover a large number of reach locations.

Let us take a look at a **Slow Moving Piece Picking operation at a Publisher** who has 9,000 SKUs or reach locations requiring 1,500 reaches per man hour (RPH) to fulfill their daily workload. In our analysis with Voice, we were able to show productivity increase to 150 RPH requiring 10 Operators. With Lights on the other hand, our analysis showed a marginal increase in productivity to 165 RPH requiring only 9 Operators; however, the hardware and installation cost of implementing lights at 9,000 Reach Locations would be 5-6 times more than Voice, making voice the preferred technology in such an environment.

High Reach Density: When Lights are less expensive and much more productive

In operations with High Reach Density, lights are much less expensive than voice because of the high number of operators that would need to be equipped with voice devices. Because there is little travel between reaches, productivity is negatively impacted by the sequential nature of voice-directed transactions and the audible instructions and spoken confirmations. The simultaneous nature of light-directed transactions, on the other hand, with visual instructions and instantaneous confirmation, enables operators to fulfill multiple orders at the same time, thereby generating higher productivity rates than voice.

Examples of High Reach Density operations include (a) fast-moving SKUs of piece picking operations from flow rack and (b) the putting of orders to store locations in the distribution center of a specialty retailer. In either operation, a high number of operators cover a relatively small number of reach locations.

Let us take a look at a **Fast Moving Piece Picking operation at an Apparel Supplier** who has 1,000 SKUs or reach locations requiring 8,500 reaches per man hour (RPH) to fulfill their daily workload. In our analysis with Voice, we were able to show 225 RPH requiring 38 Operators. With Lights on the other hand, our analysis showed exponential increase in productivity to 500 RPH, requiring only 17 Operators. Here the investment cost of lights would be half that of voice with over twice the productivity, making lights the preferred technology in such an environment.

Mixed Density: When a hybrid of lights and voice are the best blend of investment & productivity

Some operations have areas of both High Reach Density and Low Reach Density. In such environments, deploying all lights will require overinvestment in the Low Reach Density areas. Conversely, deploying all voice would require over-investment in the High Reach Density areas and would result in lower productivity rates.

Examples of operations with both High Reach Density and Low Reach Density operations include (a) piece picking operations with fast-moving SKUs and slow-moving SKUs and (b) the putting of orders to store locations in a retailer's distribution center that has a very high number of merchandise locations from which to pick. In either example, there may be many operators and many reach locations for the total operation.

Let us take a look at a **Luxury Fashion Supplier to Specialty Retailers** with 800 Reach Locations requiring 10,000 Reaches in the Fast-Moving Area and 4,500 Reach Locations requiring 1,100 reaches in the Slow-Moving SKUs Area.

From our analysis, operators equipped with only voice technology in both areas would fulfill orders at approximately 225 RPH

in the fast-moving area, 150 RPH in the slow-moving area and 209 RPH on a blended basis, requiring 52 operators to complete 11,100 reaches in an hour across both areas. Equipping reach locations with lights in both areas would enable operators to fulfill orders at approximately 500 RPH in the fast-moving SKUs, 165 RPH in the slow-moving area and 383 RPH on a blended basis, requiring 27 operators to complete 11,100 reaches in an hour across both areas.

With a hybrid solution, operators equipped with voice technology in the slow-moving area would fulfill orders at approximately 150 RPH, operators directed by lights in the fast-moving area would fulfill orders at approximately 500 RPH and all operators would fulfill orders at approximately 370 RPH on a blended basis. Such rates would require 10 operators in the slow-moving area and 17 operators in the fast-moving area, for a total 27 operators in both areas. However, in such an environment, a hybrid solution would cost approximately half that of voice or lights and provide the best blend of productivity and investment costs.

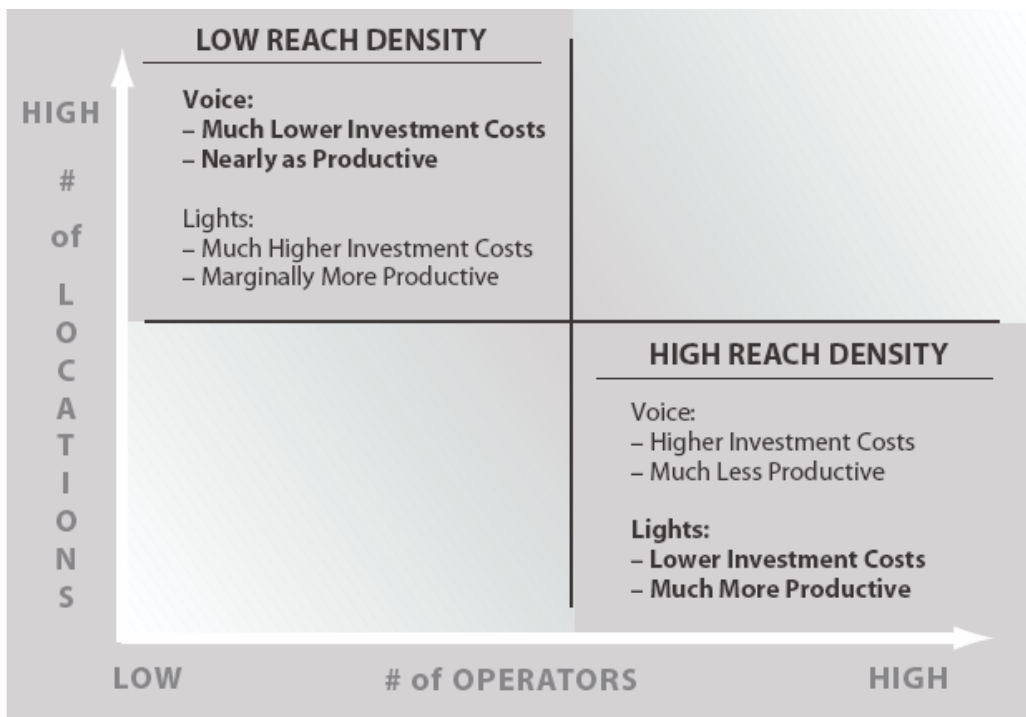


Figure 3

Conclusion

Paperless picking and putting solutions cost-effectively improve most order fulfillment operations, but it is important to choose the correct technology solution for the circumstances to optimize investment costs and productivity.

As Abraham H. Maslow said, "If the only tool you have is a hammer, you tend to see every problem as a nail," which may be why pure-play voice and lights vendors make claims about having the "best" solutions for picking and putting. Consider speaking with vendors that can integrate both lights and voice from one software platform and won't sell a hammer to everyone they meet.