Next-Generation Picking Solutions

Pick-to-Light/Pick-to-Voice Integration

Merging the best of both worlds into a unified solution

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The theory behind Pick-to-Light/Pick-to-Voice integration

Pick-to-Light (PTL) and Pick-to-Voice (PTV) functionality are not cutting-edge technologies on their own. PTL functionality has been around for 30+ years now and is commonplace in many fulfillment centers around the world. The intuitiveness of light picking has given this technology staying power in the industry.

PTV solutions are more modern than PTL solutions, but still far from what technologists would consider cutting-edge. PTV systems were developed in the late 1990s and have recently been more rapidly adopted due to advances in wireless communications, advances in voice synthesis and voice recognition software, and decreases in the cost of mobile electronics.

The theory behind the integration of PTL & PTV functionality is that human interaction with each relies upon non-overlapping senses and, therefore, some productivity gain will be seen by combining functionalities.

This theory would be tested and proven true over a 5-user/5 week full-production pilot at a major national retailer's PTL-equipped eCommerce fulfillment center.

The goal of this pilot was to increase picking productivity by a minimum of 15% with no loss in picking quality. Actual measured picking productivity increases greater than this threshold were realized along with an impressive decrease in picking errors which resulted in a greater than expected jump in pick quality.

Pick-to-Light/Pick-to-Voice Integration (The Hybrid System)

To begin the development of the PTL/PTV system (referred to as the Hybrid System in this document) Wynright began evaluating what has made each technology such a staple of logistics automation over the past few decades.

Both technologies were evaluated from the standpoint of how each interacts with human beings. Of course, PTL systems interact with humans via sight and PTV systems interact with humans via sound, but the nature of the information conveyed to the picker was of a greater concern to us.

In a standard PTL system, each SKU corresponds to single light display. When a light is pressed (extinguished), a pick is confirmed and inventory levels are decremented. This light display will typically consist of an illuminated button and a single or double-digit LED or LCD display. A centralized alphanumeric messaging display may be located in each PTL zone as well.

PTL systems convey the simplest of messages incredibly well: location and quantity. The problem is that the information conveyed stops here. Some lights systems can convey additional information, but this comes at a cost premium as more advanced displays need to be installed. With this

additional information, you may pay a premium in time as well: a user must read and process the message. Your final premium is quality. The user who has read and processed the message must now *remember* the information that was conveyed to him or her. If the message is not remembered correctly, quality will suffer.

Voice, on the other hand, can convey complicated messages in a very effective way with virtually no limit to message size. An example of a PTV picking message may be "Aisle 1. Shelf 3. Bin 4. Pick 7 each." The user interacting with this system may confirm each specific location command with an affirmative phrase such as "Ready" once he or she has reached that location. Once the specified bin/SKU has been reached a user may confirm a pick by repeating the instruction ("Pick 7.") and scanning the location or product. This spoken command and scan is used as on-the-fly quality control.

This step-by-step method of communication allows for the concise delivery of complicated, multi-step procedures to a user and removes memorization from the equation. Although stunningly accurate, the time premium on such message delivery can be prohibitive.

By combining both lights and voice, we eliminate the limitations of each technology by providing the user with a visual representation of work followed by a structured voice environment within which to prompt the user to perform the necessary actions required to complete the task.

Hybrid in action

The Hybrid System was designed to maximize the speed of information delivery to each user interacting with it. Furthermore, the Hybrid System was designed to maximize the quality of the work accomplished and the quality of the picking data relayed back to a warehouse management system (WMS).

Pick quality is maintained by the existing lights system as was done in the past. Put quality is maintained by a carton scan following each spoken put command performed by a user.

The single most important advantage of the Hybrid System is the ability of the lights system to display aggregate pick quantities that span multiple cartons. This is only possible due to real-time voice-directed put instructions.

In practice, a user will begin inducting cartons into a zone by scanning each carton ID. Each scanned carton is assigned a position number by the voice system (1, 2, 3, etc.) Once induction is complete, total aggregate pick quantities across all cartons for the current zone are calculated and relayed to the lights system. Because put commands are voice-directed, a pick for any quantity of a SKU can be accurately put into any number of cartons. This results in a higher pick density per zone which reduces foot traffic.

As an example of operation, if 7 units of SKU X are bound for carton positions 1, 3, and 4, the total quantity required for those cartons (7) will be displayed at the light position designated for SKU X. Once the light is extinguished, the spoken put command will then instruct "Put 2 in 1" and await a scan

confirmation before instructing “Put 3 in 3”, await the second scan confirmation and then instruct “Put 2 in 4”. Once all puts are confirmed, this assignment is completed. The user will then proceed to another illuminated light, pick, extinguish, and begin the put process again.

By executing the system in this way a variety of productivity gains are realized, the most obvious to the casual observer being reduced foot traffic by pickers (via increased pick density). Secondary gains that will be realized are increased quality of work and greater inventory accuracy, a result of reduced errors due to scan confirmations for each carton put command.

Results that matter

After a 5-week/5-user pilot in a major national retailer’s eCommerce fulfillment center, impressive productivity gains were seen.

Of the 8 users trained on the Hybrid System the average increase in productivity beyond traditional light picking was 17% with a 21% reduction in carton errors. This was 2% higher than the 15% productivity estimate that was committed to by Wynright.

Acknowledgements

The Hybrid System outlined in this document is a next-generation intralogistics system that was developed by a team of Wynright software developers and engineers located in Clearwater, Florida and Manchester, New Hampshire. This dedicated team of professionals worked together for several months to seamlessly integrate voice & lights into a single unified system.

The Wynright Hybrid System outlined in this document is currently patent-pending.