FASTFETCH

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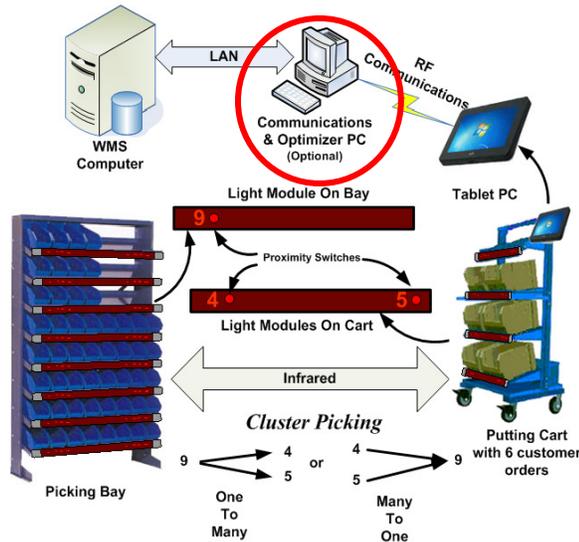www.FastFetch.biz
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Optimizer PC Functions

FASTFETCH *increases customer satisfaction and efficiency by innovatively combining voice, Bluetooth barcode scanning and light-directed picking to provide* **FAST, ACCURATE, BATCH PICKING** *in distribution and manufacturing environments.*

Requiring **only a Tablet PC** to control lighted displays on picking bays and putting carts, FastFetch enables cluster picking, reverse logistics and sequenced picking using low-cost wireless infrared communications for **light-directed picking** from storage bays and **light-directed putting** to cart locations. **Voice direction** and wireless Bluetooth **bar code scanning** confirmation is used for low velocity product locations without lighted displays.

The Problem

A wave of 200 orders must be picked this morning using carts with a capacity of 10 orders per cart. How should be orders be batched so that the 20 cartloads can be quickly picked with the least amount of work? For example, it would be wise to place orders requiring products from only one part of the picking area on the one cart and orders requiring products from only another area on a different cart.

The Goal

Ideally, the batches should be chosen so that several variables contributing to the total workload are optimized. For example these variables should be minimized:

- walking distance to pick all items (walking tends to dominate total pick time)
- stops on the traversal path (pick as much as possible at each stop)
- unused space on cart shelves (multiple size cartons may result in wasted space)
- Aging of orders (an order's priority increases as it gets older)

while these variables should simultaneously be maximized:

- priority compliance (important orders are picked first)
- number of common items (clustering common picks across multiple orders saves time)
- items meeting a carrier departure schedule (pick orders on the truck/container before it leaves)
- employee workload balance (keep all employees busy picking rather than idle waiting for work)

The FastFetch Solution

For all but trivial size waves, the problem of computing a true optimal solution is intractable, meaning it is so hard that computing the "best" solution is impossible within a practical timeframe. A few attempts have been made to use "greedy" algorithms that create a few batches in a wave with excellent picking performance, but other batches in the wave have poor performance. Consequently, total performance is often poor.

The FastFetch Optimizer PC uses a "genetic algorithm" that borrows from the principles of biology to quickly compute a "near optimal" solution. Unlike "greedy" algorithms, FastFetch's method creates batches so that picking performance is optimized across the total set of batches in the wave.

FastFetch's Optimizer PC creates excellent batches so quickly that the system can also support "waveless" picking in which orders can continuously be added to the set of unpicked orders and batches created dynamically from all unpicked orders.

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The following diagram illustrates the advantages of FastFetch's optimized batching.
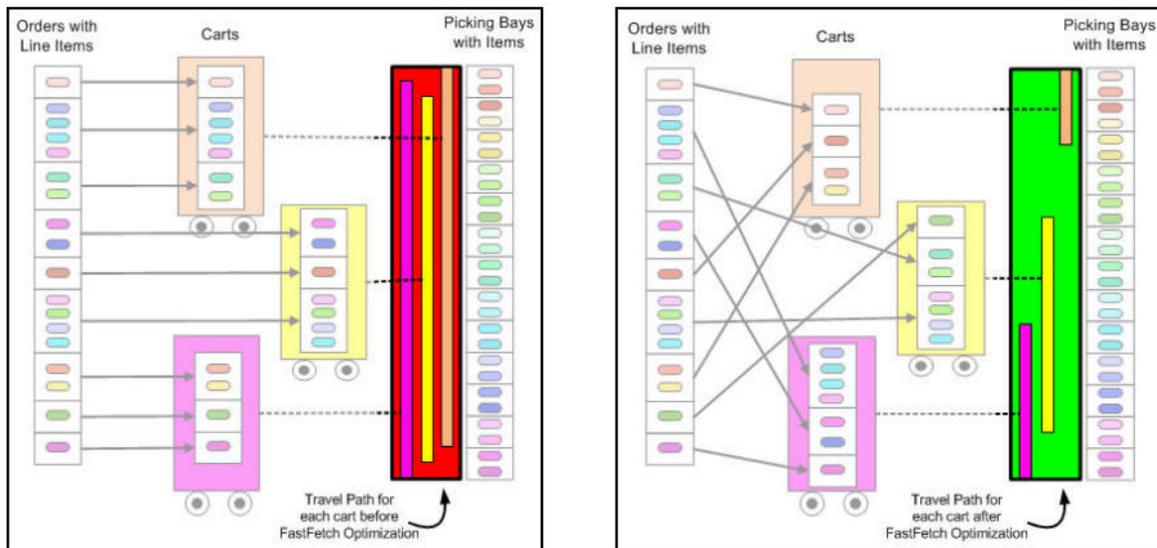
Arrival Order Batching Travel Paths   **Optimized Batching** Travel Paths

Other Optimizations

Clustering Optimization: Once batches have been determined, another optimization process determines how to best cluster pick SKUs from a bay when there are opportunities to pick multiple SKUs for a single order or to pick one SKU for multiple orders in each batch. The goal of this optimization is to make as few walks as possible from the Bay to the cart to perform all picking at the bay. The FastFetch Optimization PC performs this process and passes the results to the Tablet PC during picking.

Order Completion and Replacement: Consider a picking area with numerous aisles running parallel to each other so a picker would normally walk a serpentine path through the area. Further consider a powered conveyer running perpendicular to the aisles to one end of the picking area to take completed orders to shipping.   When the FastFetch Tablet PC determines that an order has been completed it commands the picker to stop the cart at the end of the aisle when it reaches the conveyor and puts the word *donE* in the display of the light module(s), adjacent to the completed order(s). Using voice commands, the picker is then requested to offload the completed order(s) and place them on the conveyor for transport to shipping.

The FastFetch Optimizer PC will then download a new order to the cart to replace the order offloaded. The new order will be selected from the total available set of orders so that the one selected can be completed the most quickly in the direction the cart is moving. For example, it would be better to download an order that could be fully picked in the next few bays rather than one that would require picking from a bay that had been passed recently. The FastFetch Tablet PC next verbally instructs the picker to open a new box and place it into the now empty cart location, apply a temporary bar code label (license plate) to the box, scan the bar code on the box and touch the red, flashing LED on the cart light module the Tablet PC activated after the scan.

This type of operation is ideal for continuous picking in which a cart continues through the picking area in a "circular" pattern, unloading completed orders and loading new orders as required.

Manual Optimization: Occasionally, information needed for batch creation is not available to the Optimizer PC. In this case, a company dispatcher can manually create or override batches using an interactive process on the Optimizer PC.   This information is validated for consistency (e.g. an order cannot be contained in multiple batches) and sent to a Tablet PC when requested.