PICKING STRATEGIES: IN-DEPTH COMPARISON

by LOGIWA

ORDER BASED PICKING | CLUSTER PICKING | BATCH PICKING

LOGIWA

CONTENT

LOGIWA

ORDER PICKING ACCOUNTS FOR 60% OF OPERATIONAL COSTS IN A DISTRIBUTION CENTER

As such, order picking is one of the most important activities within the warehouse. Your picking process also has a direct impact on the customer service level.

In this guide, we evaluate 3 common picking methods and analyze the associated productivity and costs.

ORDER BASED PICKING

CLUSTER PICKING

BATCH PICKING

COMPARING THE 3 MOST COMMON PICKING METHODS

We simulated 3 different scenarios to calculate the total time needed to complete the picking process using each of these methods.

| PICKING METHODS	TOTAL TIME TO COMPLETE PICKING
Order Based Picking	**27.8** Hours
Cluster Picking	**13.8** Hours
Batch Picking & Sorting	**12.6** Hours

Our results indicated that cluster picking and batch picking have a tremendous effect on productivity.

LOGIWA

OUR SAMPLE WAREHOUSE MODEL

We assume that our sample warehouse is a retail and e-commerce warehouse. In this sample study, we use mezzanine locations, staging areas and sorting locations (pigeon holes).

Our objective is to show the effect of picking strategies on labor productivity.

SAMPLE MODEL
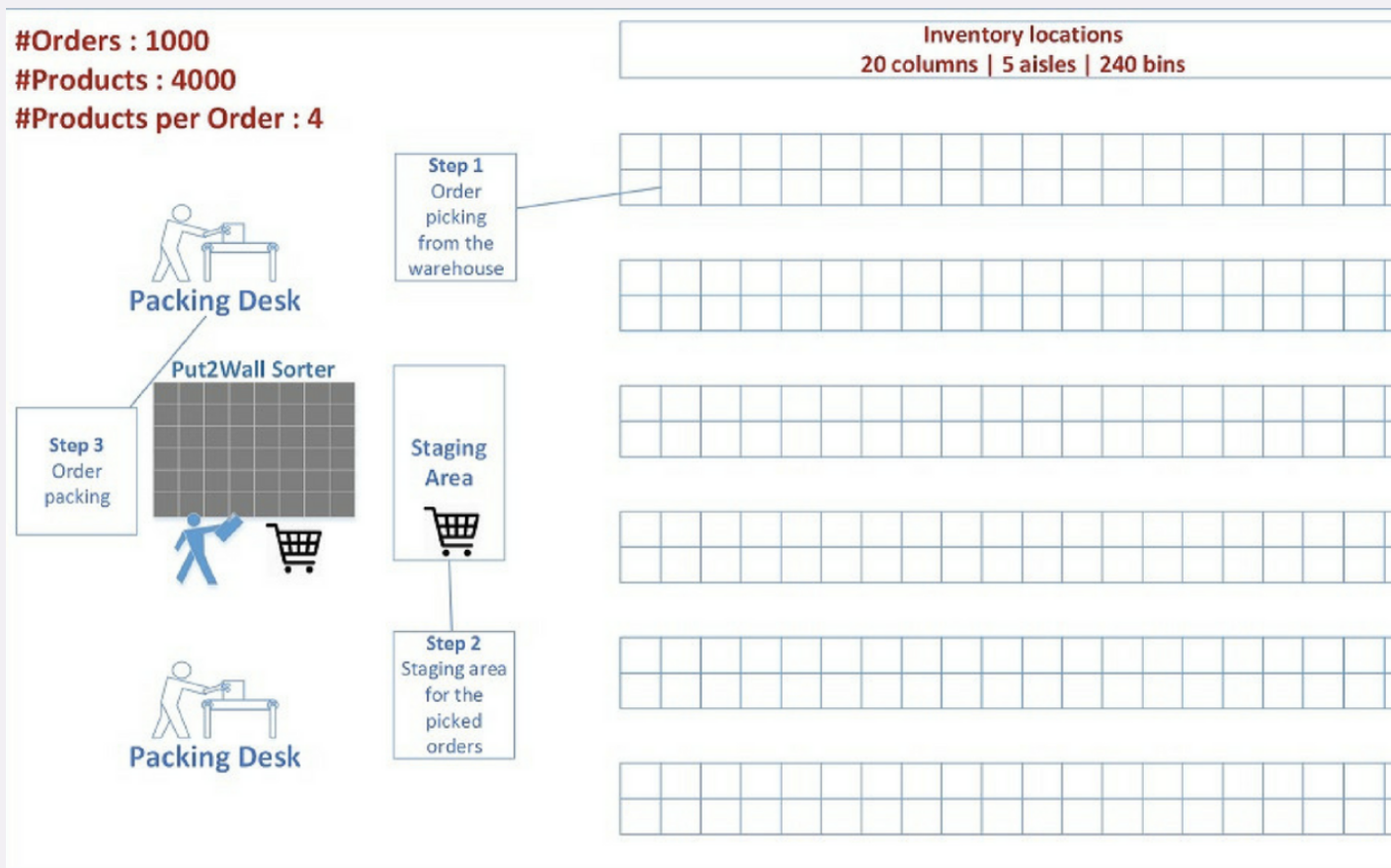
SYSTEM

- A warehouse management system is used in the warehouse.
- The warehouse workers use mobile barcode scanners.

SCENARIO

- There are 1,000 orders to be shipped. Each order has 4 products.
- In total, there are 4,000 products to be picked.

WAREHOUSE LAYOUT

- The warehouse has 240 bins (or locations) and 5 aisles.
- The picking process starts from the staging area and finishes at the staging area. Trolleys are used to execute picking tasks.
- There are 2 packing stations.
- There are unlimited picking trolleys.
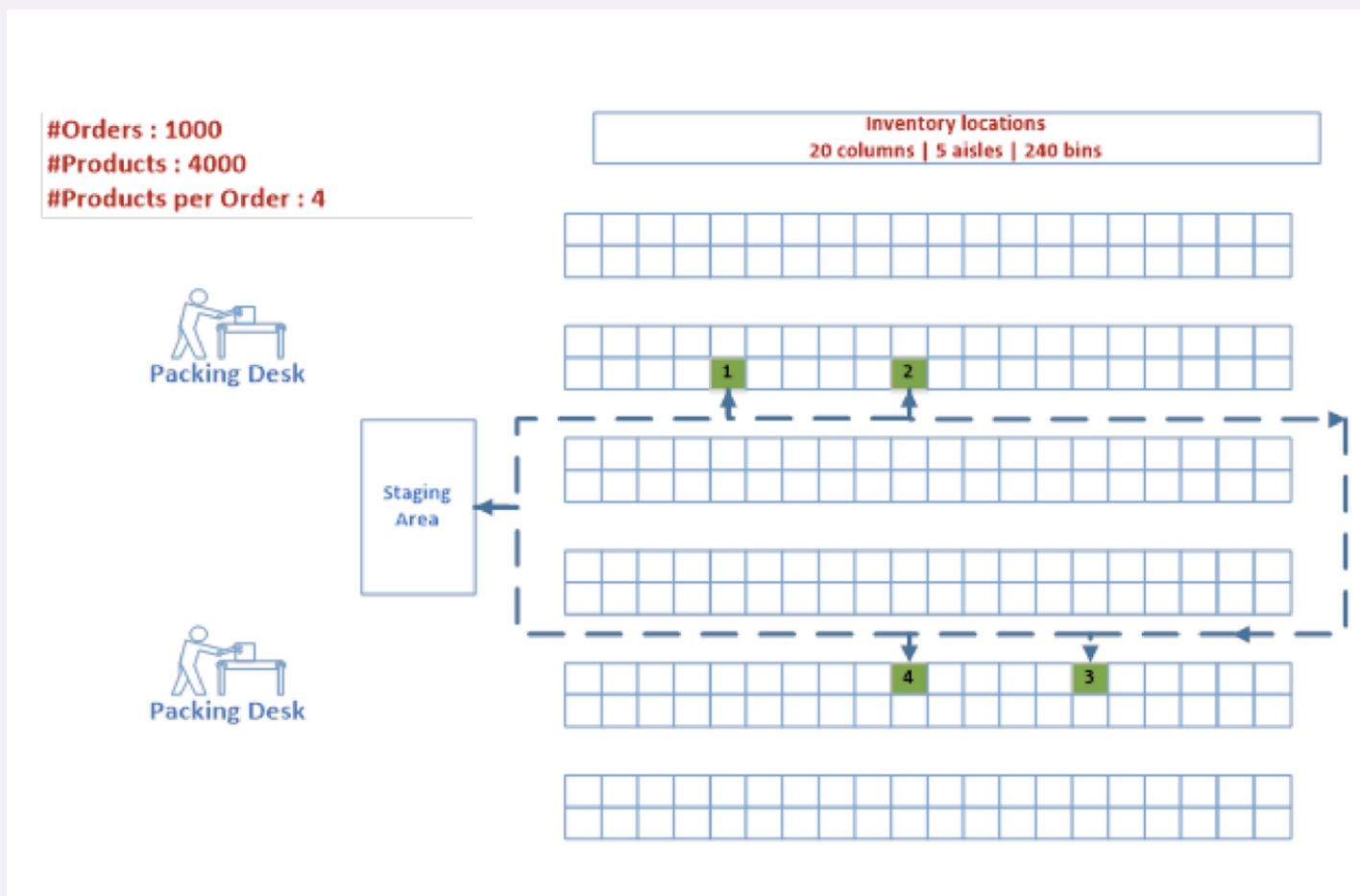- There is 1 sorting/consolidation station which has 250 bins.
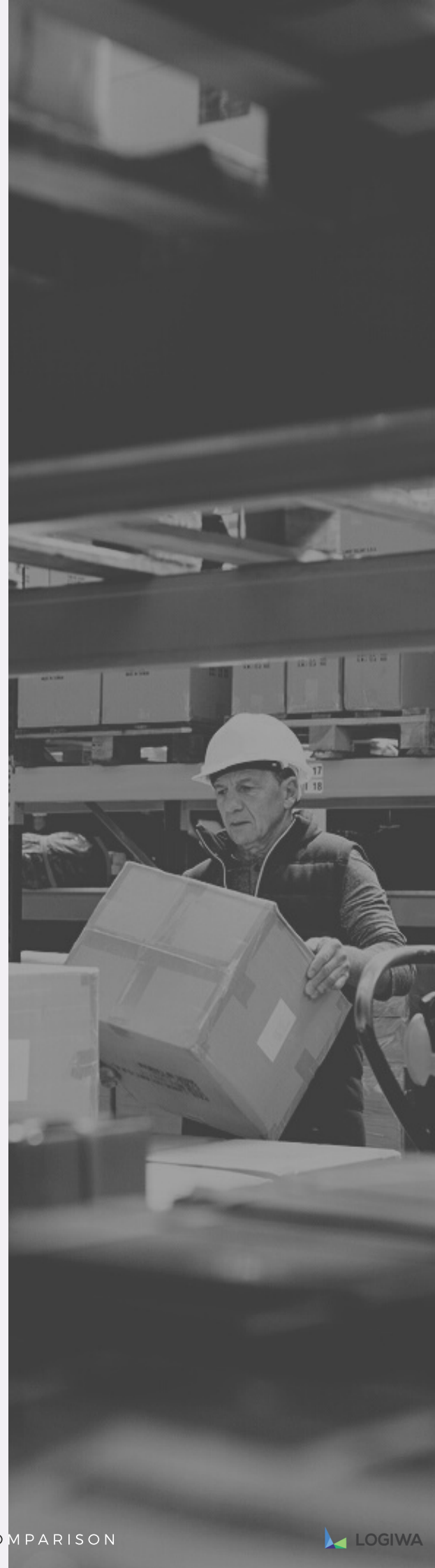
ORDER BASED PICKING

Order based picking is the most common order-picking method, products are stored in fixed locations (bins).

An order picker picks one order at a time following a trip up and down each aisle until the entire order is picked. The order picker usually uses trolleys, empty pallets or picking carts.

BUSINESS FLOW

#Orders : 1000
#Products : 4000
#Products per Order : 4

Inventory locations
20 columns | 5 aisles | 240 bins

Packing Desk

Staging Area

Packing Desk

USE CASE

- Picker gets a trolley from the staging area.
- Picker uses his mobile device to pick the next order.
- Picker is directed by WMS to the item's location to pick the items.
- Picker picks the item and puts it into the trolley. User continues until the entire order is picked.
- Picker leaves the trolley to the staging area.

STANDARD TIMES AND DISTANCES

Average Picking Time: Average picking time of a product from a bin is 5 seconds

Walking Speed: A picker walks 3.28 feet in 1 second(1 meter/second)

Average Setup Time: The required time to start order picking (setting the trolley/box) is 20 seconds

ASSUMPTIONS

- Each order is picked separately. A picker starts from the staging area and visits all the product locations and returns back to the staging area. Each order has 4 products.
- Average distance to pick an order is 196.8 feet. The picker walks 60 seconds (3.28 feet / second) for each order.
- Setup time for an order is 20 seconds (Picker prepares the empty trolley/box for the next trip and drops the picked trolley/box.)

RESULTS

Total time to pick 1,000 orders =
(#Orders * Setup time) + (#Orders * Average distance to pick an order) + (#Order Line * Operation time to pick a product)
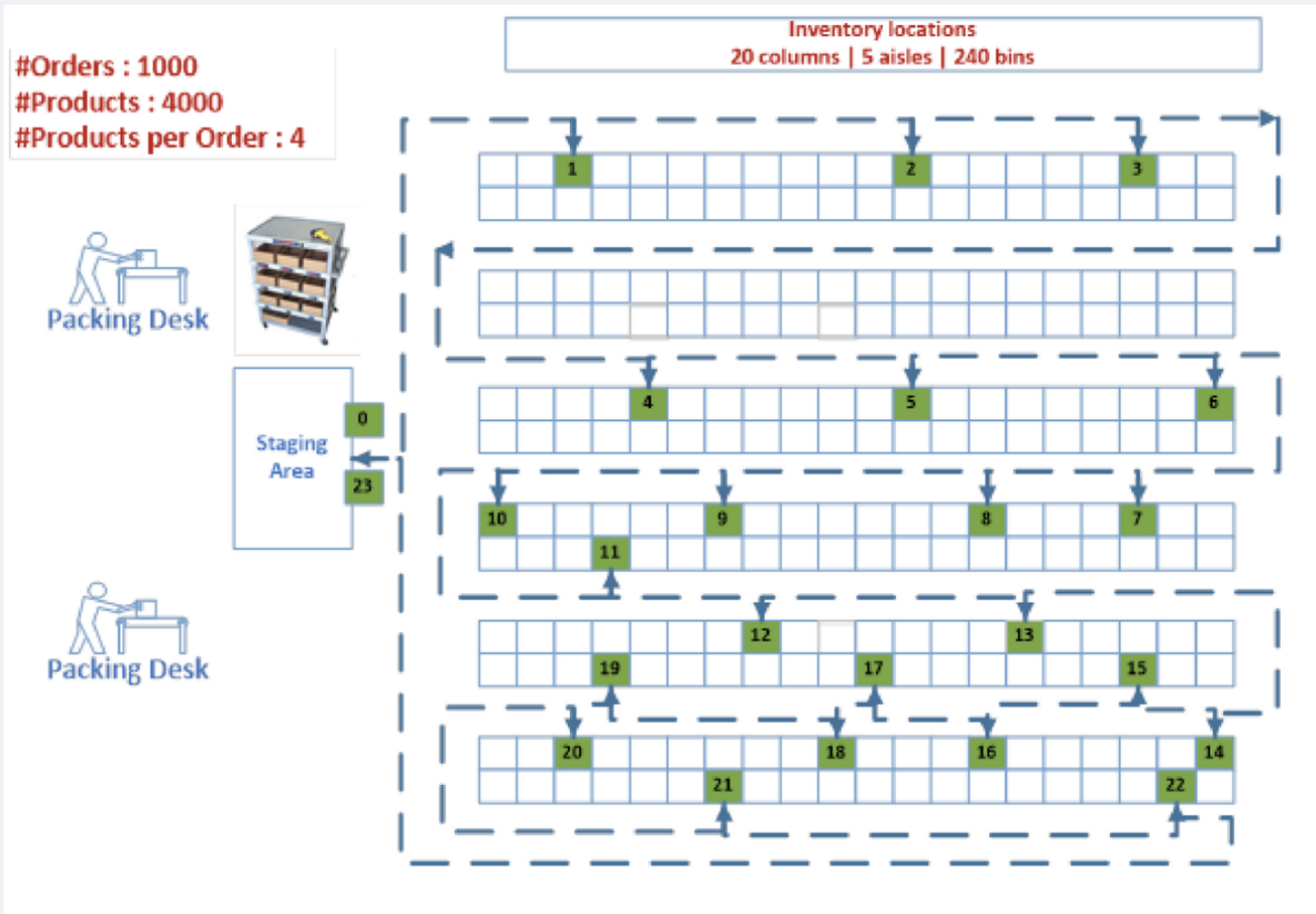
Total time to pick 1,000 orders=
(1,000 * 20) +(1,000 *196.8) + (4,000 * 5) = **100,000 seconds**

CLUSTER PICKING

Cluster picking is the process of picking products into multiple order containers (totes) at one time. In our scenario, the picking carts have 12 totes. The picker starts his trip to pick 12 orders (48 products) into 12 totes.

USE CASE

- Picker gets a trolley from the staging area.
- Picker uses his mobile device to pick the next cluster.
- Picker is directed by the WMS to the item's location to pick the items.
- Picker picks the item and puts it into trolley's suggested bin. Picker continues the operation, until entire orders are picked.
- Picker leaves the trolley to the staging area.

STANDARD TIMES AND DISTANCES

Average Picking Time: Time of picking a product and putting the item into a bin is 6 seconds.

Walking Speed: A picker walks 3.28 feet in 1 second (3.28 feet /second).

Average Setup Time: Required time to start order picking (getting the trolley, preparing the totes) is 120 seconds

Cluster Size: The number of orders that are picked together in a cluster is 12.

Total Clusters: The total number of clusters to pick 1,000 orders is 83.

Average Walking Time: The picker walks 190 seconds through all the aisles up and down to pick for 12 orders in a cluster of 48 items.

ASSUMPTIONS

- 12 orders are picked together in each trip. A picker starts from the staging area and visits all the product locations and returns back to staging area. Each order has 4 products.
- In order to pick 48 products, the picker visits 22 locations. (Assumed that there are similar products within 12 orders.)Average distance to complete a cluster is 623.2 feet. The picker walks 190 seconds (3.28 feet / second) for each cluster.
- Setup time for a trip (12 orders) is 120 seconds. (Picker prepares the empty trolley for the next trip and drops the picked trolley.)

RESULTS

Total time to pick a cluster which includes 12 orders =
(Trolley setup time) + Average walking time for 12 orders in a cluster) + (#Order Line * Operation time to pick a product)

Total time to execute a cluster which includes 12 orders =
120) + (190) + (48 * 6) = 598 seconds

Total time to pick 1,000 orders = #Cluster * Total time to execute a cluster

Total time to pick 1,000 orders = 550 * 83 = **49,833 seconds**

WAREHUSE MANAGEMENT SOFTWARE WHITEPAPER

A lot happens in a warehouse. From all the processes and procedures related to moving inventory in and out of your warehouse, to the different sales and shipping channels...

Logiwa allows you to seamlessly connect this information and maintain accurate inventory levels.

[Download Now!](#)

BATCH PICKING & PUT TO WALL

Batch picking is the picking method that combines multiple orders into one picking trip. After the picking process, items are sorted/consolidated by order. Batch picking increases throughput and operational efficiency. Batch picking improves picking efficiency by consolidating pick quantities and minimizing the walking distances.

BUSINESS FLOW
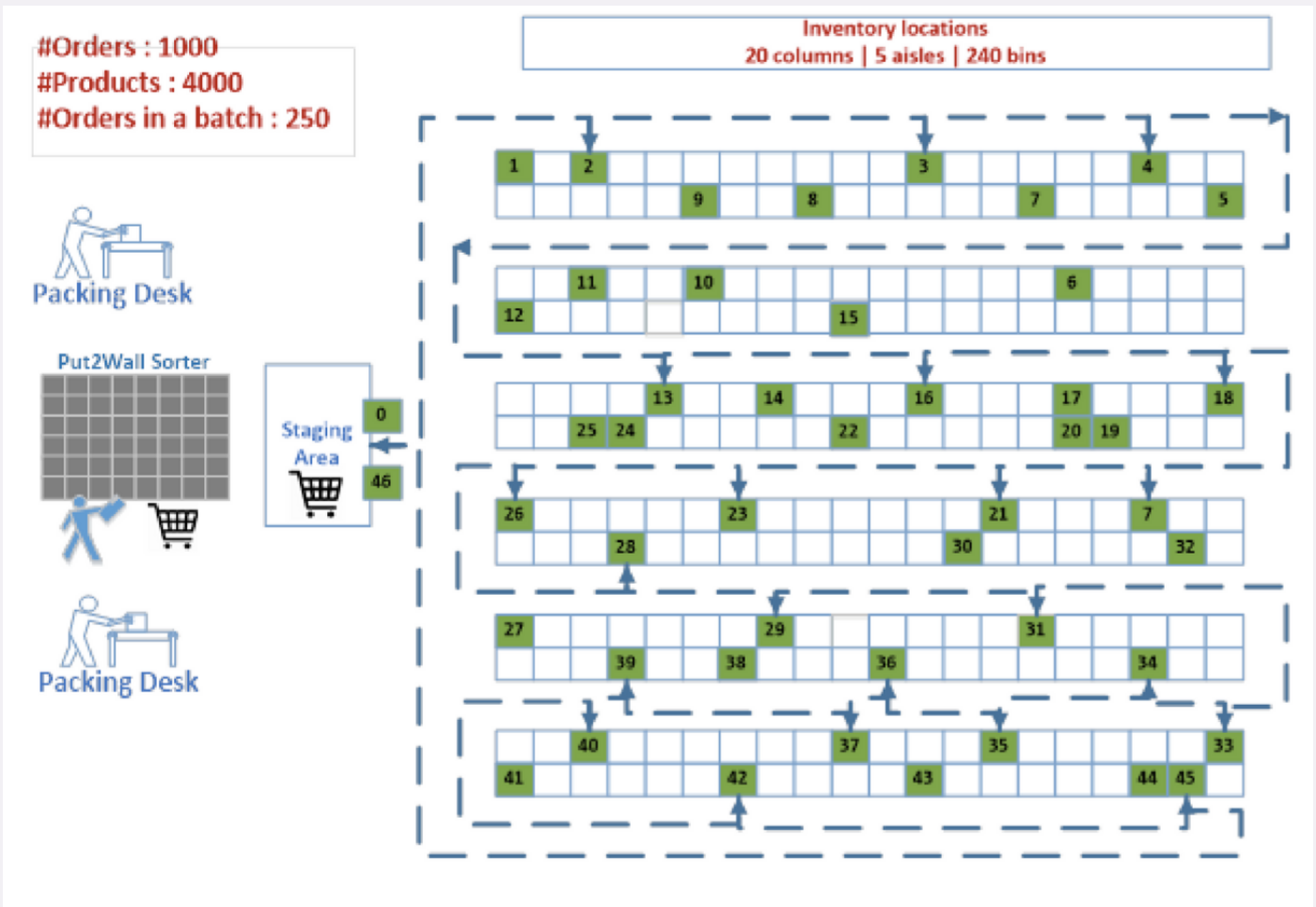
USE CASE

- Picker gets a trolley from the staging area.
- Picker uses his mobile device to get the next batch to be picked.
- Picker is directed by WMS to the item's location to pick the items.
- Picker picks the item and puts it into trolley. User continues the operation until the entire batch is picked.
- Picker moves the trolley to the sorting station.
- Picker gets an item from the trolley.
- Picker is directed by the WMS to the sorting/consolidation station(Pigeonhole).
- The picker puts the item into the sorter bin and continues till all the items are sorted into bins.

STANDARD TIMES AND DISTANCES

Average Picking Time: Average picking time of a product from a bin is 5 seconds.

Walking Speed: A picker walks 3.28 feet in 1 second (3.28 feet/second).

Average Setup Time: Required time to start order picking (getting the trolley, preparing totes) is 120 seconds.

Average Picking Time: The operation time to pick a product from the bin is 5 seconds.

Average Time Sort An Item: The operation time to sort a product in the put-wall station is 1.5 seconds.

Batch Size: The number of orders that are picked together in a batch is 250 Orders.

Total Batches: The total number of batches to pick 1,000 orders is 4 batches.

Average Walking Time: Picker walks through all the aisles up and down for 250 orders in a cluster.

ASSUMPTIONS

- 250 orders are picked together in each trip. A picker starts from the staging area and visits all the product locations and moves the trolley to the sorting station.
- In order to complete picking of a batch, the picker visits 45 locations. (Assuming that there are similar products within 250 orders.)
- Average distance to complete a batch is 190 meters. The picker walks 190 seconds (3.28 feet/ second) for each batch.
- Setup time for a trip is 120 seconds (Picker prepares the empty trolley for the next trip and leaves the picked trolley.)

RESULTS

Total time to pick a batch which includes 250 orders =
(Trolley setup time) + Average walking time for 250 orders in a batch) + (#Order Line * Operation time to pick a product)

Total time to execute a cluster which includes 12 orders = (120) +(190) + (1,000 * 5) = 5,310 seconds

Total time to pick 1,000 orders = #Batch * Total time to execute a batch

Total time to pick 1,000 orders = 4 * 5,310 = 21,240 seconds

Total time to sort a batch (250 orders/1,000 items) =(Setup time for a batch) + (#Order Line * Operation time to sort a product)

Total time to sort a batch (250 orders/1,000 items) = 120 + 1,000*1.5 = 6,030 seconds

Total time to sort 4 batches = 4 * 6,030 = 24,120 seconds

Total time to complete all orders = 21,240 + 24,120 = **45,360 seconds**

CONCLUSION

Picking is the most essential and costly process when it comes to warehouse operations. Optimizing your picking process can lead to dramatic cost savings.

In our comparison above, we found that cluster picking and batch picking generated the most time savings. However, it will be up to you to determine which method of the two will suit your warehouse operations.

Picking Methods	Total Time to Complete Picking	
Order based picking	27.8 Hours	Over 101% time saving
Cluster Picking	13.8 Hours	
Batch Picking	12.6 Hours	Over 9% time saving

A WAREHOUSE MANAGEMENT SOFTWARE IS ESSENTIAL TO STREAMLINE ORDER PICKING

A warehouse management system creates a higher return on investment through more efficient management of picking processes. A warehouse management system should have the flexibility to apply different picking strategies based on the requirements of the warehouse, product type, order structure etc.

ENJOY EASY AND AUTOMATED
ORDER PICKING PROCESS FLOWS WITH LOGIWA.

THANKS FOR READING

contact us for more information

www.logiwa.com

hello@logiwa.com

LOGIWA