

CLAIMS

1. A computer-implemented system for automated inventory shuffling, comprising:
 - at least one processor;
 - a memory comprising instructions that, when executed by the at least one processor, performs steps comprising:
 - receive information comprising data regarding a network of a plurality of fulfillment centers (FCs), the data comprising a capacity of each FC;
 - initialize a data structure comprising a plurality of nodes, the number of nodes equal to the number of FCs;
 - determine, based on the capacity of each FC, a weighting factor associated with each FC relative to the received FC capacities,
 - wherein the weighting factor is associated with an inbound capacity of the respective FC and an inventory level in the respective FC;
 - receive, for assignment to one or more FCs, a product identifier associated with a product, the identifier associated with a quantity and a minimum order quantity, wherein the product identifiers are divided into one or more categories by:
 - receiving information associated with a plurality of product identifiers, the information comprising demand of each product identifier;
 - assigning a plurality of subsets of the product identifiers with highest demand forecast quantities to a first set of categories; and
 - assigning the remaining subsets of the product identifiers with the next highest demand forecast quantities to a second set of categories; and
 - perform a preliminary mapping of the quantity to the plurality of FCs based on the associated minimum order quantity;
 - based on the product identifier, determining whether to rebalance the preliminary mapping of the quantity, and if so, rebalancing the preliminary mapping based on the weighting factor associated with each FC, to promote maximum utilization of the network;
 - determine a category associated with the product identifier;

based on determining that the product identifier is associated with the first set of categories, rebalancing the preliminary mapping of the quantity; and forward instructions to a computer system to cause a received quantity to be delivered to the network based on the preliminary mapping.

2. The computer-implemented system of claim 1, wherein:
the quantity comprises at least a safety reorder quantity and a cycle reorder quantity; and
rebalancing the preliminary mapping of the quantity comprises rebalancing the safety reorder quantity across the network.
3. The computer-implemented system of claim 1, wherein the quantity of the product identifier comprises at least one of a sum of demand forecast quantities for the product over a first period of time and a sum of safety stock quantities for the product over a second period of time.
4. The computer-implemented system of claim 1, wherein the quantity of the product identifier is determined based on a number of incoming orders for the associated product.
5. The computer-implemented system of claim 1, wherein rebalancing the preliminary mapping comprises evaluating a cost function for each FC.
6. The computer-implemented system of claim 5, wherein the cost function comprises determining a cost value for each FC based on the quantity associated with the product identifier, a reorder quantity associated with the product identifier, and an FC utilization value.
7. The computer-implemented system of claim 6, wherein the steps further comprise assigning a higher proportion of the quantity to an FC having a lowest associated cost value.

8. A computer-implemented method for inventory shuffling, the method being performed by at least one processor of a networked server executing stored instructions to perform steps comprising:

- receive information comprising data regarding a network of a plurality of fulfillment centers (FCs), the data comprising a capacity of each FC;

- initialize a data structure comprising a plurality of nodes, the number of nodes equal to the number of FCs;

- determine, based on the capacity of each FC, a weighting factor associated with each FC relative to the received FC capacities,

 - wherein the weighting factor comprises an inbound capacity of the respective FC and an inventory level in the respective FC;

- receive, for assignment to one or more FCs, a product identifier associated with a product, the identifier associated with a quantity and a minimum order quantity, wherein the product identifiers are divided into one or more categories by:

 - receiving information associated with a plurality of product identifiers, the information comprising demand of each product identifier;

 - assigning a plurality of subsets of the product identifiers with highest demand forecast quantities to a first set of categories; and

 - assigning the remaining subsets of the product identifiers with the next highest demand forecast quantities to a second set of categories; and

- perform a preliminary mapping of the quantity to the plurality of FCs based on the associated minimum order quantity;

- based on the product identifier, determining whether to rebalance the preliminary mapping of the quantity; based on determining to rebalance the preliminary mapping, rebalancing the preliminary mapping of the quantity based on the weighting factor associated with each FC, to promote maximum utilization of the network;

 - determine a category associated with the product identifier;

- based on determining that the product identifier is associated with the first set of categories, rebalancing the preliminary mapping of the quantity; and

forward instructions to a computer system to cause a received quantity to be delivered to the network based on the preliminary mapping.

9. The computer-implemented method of claim 8, wherein:
the quantity comprises at least a safety reorder quantity and a cycle reorder quantity; and
rebalancing the preliminary mapping of the quantity comprises rebalancing the safety reorder quantity across the network.
10. The computer-implemented method of claim 8, wherein the quantity of the product identifier comprises at least one of a sum of demand forecast quantities for the product over a first period of time and a sum of safety stock quantities for the product over a second period of time.
11. The computer-implemented method of claim 8, wherein the quantity of the product identifier is determined based on a number of incoming orders for the associated product.
12. The computer-implemented method of claim 8, wherein rebalancing the preliminary mapping comprises evaluating a cost function for each FC.
13. The computer-implemented method of claim 12, wherein the steps further comprise assigning a higher proportion of the quantity to an FC having a lowest associated cost value.
14. A computer-implemented method inventory shuffling, the method being performed by at least one processor of a networked server executing stored instructions to perform steps comprising:
receive information comprising data regarding a network of a plurality of fulfillment centers (FCs), the data comprising an inbound capacity and a total capacity of each FC;

initialize a data structure comprising a plurality of nodes, the number of nodes equal to the number of FCs;

determine, based on a ratio of the inbound capacity and the total capacity, a utilization value for each FC;

receive, for assignment to one or more FCs, a product identifier associated with a product, the identifier associated with a quantity and a minimum order quantity, wherein the product identifiers are divided into one or more categories by:

receiving information associated with a plurality of product identifiers, the information comprising demand of each product identifier;

assigning a plurality of subsets of the product identifiers with highest demand forecast quantities to a first set of categories; and

assigning the remaining subsets of the product identifiers with the next highest demand forecast quantities to a second set of categories; and

perform a preliminary mapping of the quantity to the plurality of FCs based on the associated minimum order quantity;

based on the product identifier, determining whether to rebalance the preliminary mapping of the quantity; based on determining to rebalance the preliminary mapping, rebalancing the preliminary mapping of the quantity based on the utilization value associated with each FC, to promote maximum utilization of the network;

determine a category associated with the product identifier;

based on determining that the product identifier is associated with the first set of categories, rebalancing the preliminary mapping of the quantity; and

forward instructions to a computer system to cause a received quantity to be delivered to the network based on the preliminary mapping.