

CLAIMS

1. A computer-implemented system for outbound forecasting, the system comprising:
 - a memory storing instructions; and
 - at least one processor configured to execute the instructions to:
 - receive, from a sales forecast system, a prediction of a regional sales forecast indicative of a customer demand for each stock keeping unit (SKU) in a plurality of regions;
 - receive, from a SKU correlation system, a prediction of a correlation of one or more SKUs that will be combined in customer orders in the plurality of regions;
 - receive, from an order size calculation system, a prediction of a size of customer orders in the plurality of regions, wherein a customer order profile is simulated based on the predicted correlation and the predicted size;
 - apply a fulfillment center (FC) priority filter to the simulated customer order profile;
 - map each SKU to a FC, among a plurality of FCs, for managing outbound of each SKU based on the predicted regional sales forecast and the simulated customer order profile;
 - simulate outbound flow of products based on the mapping, wherein simulating outbound flow of products comprises:
 - feeding a first genetic algorithm with the mapping of each SKU to generate one or more additional mappings of each SKU to a FC; and
 - selecting an optimal mapping of each SKU to a FC;
 - modify a database to assign each SKU to a FC based on the selected optimal mapping; and
 - send instructions to a plurality of mobile devices, each mobile device associated with a respective user physically in a FC, to stow

products associated with each SKU in corresponding FCs for shipping to customers based on the selected optimal mapping, wherein the FC priority filter is generated using a second genetic algorithm and comprises an optimal distribution of priority values assigned to each FC that maximizes a number of FCs having an outbound capacity utilization value above a predetermined threshold.

2. The system of claim 1, wherein the at least one processor is further configured to execute the instructions to simulate inventory using at least one of open purchase orders or past customer orders.
3. The system of claim 2, wherein open purchase orders comprise unfulfilled customer orders.
4. The system of claim 2, wherein the at least one processor is further configured to execute the instructions to predict the FC for managing outbound of each SKU based on the simulated inventory.
5. The system of claim 1, wherein mapping each SKU to a FC further comprises selecting a FC, among the plurality of FCs, with a highest priority level.
6. The system of claim 1, wherein mapping each SKU to a FC further comprises selecting a FC, among the plurality of FCs, capable of delivering a maximum number of the one or more SKUs that will be combined in customer orders.
7. The system of claim 1, wherein the FC priority filter varies based on each customer order.
8. The system of claim 1, wherein receiving the prediction of the regional sales forecast further comprises separating national sales forecast into a plurality of regions.

9. The system of claim 1, wherein the at least one processor is further configured to execute the instructions to predict inventory at one or more FCs on a particular future date.
10. The system of claim 1, wherein the steps of receiving the prediction of the regional sales forecast, receiving the prediction of the correlation of one or more SKUs, receiving the prediction of the size of customer orders in the plurality of regions, applying the FC priority filter to the simulated customer order profile, and predicting the FC for managing outbound of each SKU are repeated based on a number of days of outbound forecasting.
11. A computer-implemented method for outbound forecasting, the method comprising:
 - receiving, from a sales forecast system, a prediction of a regional sales forecast indicative of a customer demand for each stock keeping unit (SKU) in a plurality of regions;
 - receiving, from a SKU correlation system, a prediction of a correlation of one or more SKUs that will be combined in customer orders in the plurality of regions;
 - receiving, from an order size calculation system, a prediction of a size of customer orders in the plurality of regions, wherein a customer order profile is simulated based on the predicted correlation and the predicted size;
 - applying a fulfillment center (FC) priority filter to the simulated customer order profile;
 - mapping each SKU to a FC, among a plurality of FCs, for managing outbound of each SKU based on the predicted regional sales forecast and the simulated customer order profile;
 - simulating outbound flow of products based on the mapping, wherein simulating outbound flow of products comprises:

feeding a first genetic algorithm with the mapping of each SKU to generate one or more additional mappings of each SKU to a FC; and
selecting an optimal mapping of each SKU to a FC;
modifying a database to assign each SKU to a FC based on the selected optimal mapping; and
sending instructions to a plurality of mobile devices, each mobile device associated with a respective user physically in a FC, to stow products associated with each SKU in corresponding FCs for shipping to customers based on the selected optimal mapping, wherein the FC priority filter is generated using a second genetic algorithm and comprises an optimal distribution of priority values assigned to each FC that maximizes a number of FCs having an outbound capacity utilization value above a predetermined threshold.

12. The method of claim 11, further comprising simulating inventory using at least one of open purchase orders or past customer orders.
13. The method of claim 12, wherein open purchase orders comprise unfulfilled customer orders.
14. The method of claim 12, further comprising predicting a FC for managing outbound of each SKU based on the simulated inventory.
15. The method of claim 11, wherein mapping each SKU to a FC further comprises selecting a FC, among the plurality of FCs, with a highest priority level.
16. The method of claim 11, wherein mapping each SKU to a FC further comprises selecting a FC, among the plurality of FCs, capable of delivering a maximum number of the one or more SKUs that will be combined in customer orders.

17. The method of claim 11, wherein the FC priority filter varies based on each customer order.
18. The method of claim 11, wherein receiving the prediction of the regional sales forecast further comprises separating national sales forecast into the plurality of regions.
19. The method of claim 11, further comprising predicting inventory at one or more FCs on a particular future date.
20. A computer-implemented system for outbound forecasting, the system comprising:
 - a memory storing instructions; and
 - at least one processor configured to execute the instructions to:
 - receive, from a sales forecast system, a prediction of a regional sales forecast indicative of a customer demand for each stock keeping unit (SKU) in a plurality of regions;
 - receive, from a SKU correlation system, a prediction of a correlation of one or more SKUs that will be combined in customer orders in the plurality of regions;
 - receive, from an order size calculation system, a prediction of a size of customer orders in the plurality of regions, wherein a customer order profile is simulated based on the predicted correlation and the predicted size;
 - apply a fulfillment center (FC) priority filter to the simulated customer order profile;
 - simulate inventory using open purchase orders and past customer orders, wherein the open purchase orders comprise unfulfilled customer orders;

map each SKU to a FC, among a plurality of FCs, for managing outbound of each SKU based on the predicted regional sales forecast, the simulated customer order profile, and the simulated inventory; simulate outbound flow of products based on the mapping, wherein simulating outbound flow of products comprises: feeding a first genetic algorithm with the mapping of each SKU to generate one or more additional mappings of each SKU to a FC; and selecting an optimal mapping of each SKU to a FC; modify a database to assign each SKU to a FC based on the selected optimal mapping; and send instructions to a plurality of mobile devices, each mobile device associated with a respective user physically in an FC, to stow products associated with each SKU in corresponding FCs for shipping to customers based on the selected optimal mapping, wherein the FC priority filter is generated using a second genetic algorithm and comprises an optimal distribution of priority values assigned to each FC that maximizes a number of FCs having an outbound capacity utilization value above a predetermined threshold.