CLAIMS

1. A computer-implemented system for intelligent generation of purchase orders, the system comprising:

a memory storing instructions; and

at least one processor configured to execute the instructions for:

receiving one or more demand forecast quantities of one or more products, the one or more products corresponding to one or more product identifiers, and the demand forecast quantities comprising a demand forecast quantity for each product for each unit of time;

receiving supplier statistics data for one or more suppliers, the suppliers being associated with a portion of the one or more products;

receiving current product inventory levels and currently ordered quantities of the one or more products;

determining order quantities for the one or more products based at least on the demand forecast quantities, the supplier statistics data, and the current product inventory levels;

prioritizing the order quantities based on one or more supplier-specific parameters updated in a feed forward loop;

distributing the prioritized order quantities to one or more locations;

generating purchase orders to the suppliers for the one or more products based on the distributed order quantities; and

updating the one or more supplier-specific parameters based on the one or more products received in response to the purchase orders.

2. The computer-implemented system of claim 1, wherein the instructions further comprise constraining the order quantities, wherein constraining a first order quantity of a first product comprises:

identifying a subset of the suppliers corresponding to the first product;

extracting from the supplier statistics data, past order quantities and actual received quantities for the subset of suppliers;

determining an average fulfillment ratio of the actual received quantities to the past order quantities; and

applying the average fulfillment ratio to the first order quantity.

3. The computer-implemented system of claim 1, wherein a first order quantity of a first product comprises at least one of a sum of demand forecast quantities for the first product over a first period of time and a sum of safety stock quantities for the first product over a second period of time.

4. The computer-implemented system of claim 1, wherein prioritizing the order quantities comprises:

grouping the product identifiers into one or more groups;

determining whether a sum of the order quantities exceeds a sum of inbound capacities of the locations; and

reducing the order quantities until the sum of the order quantities is less than the sum of the inbound capacities.

5. The computer-implemented system of claim 4, wherein reducing the order quantities comprises:

reducing the order quantities of a first subset of the one or more products in a first group with a positive current product inventory level to zero;

reducing the order quantities of a second subset of the one or more products in a second group with zero current product inventory level to one or more minimum quantities determined based on the demand forecast quantities; and

reducing the order quantities of the second subset of the one or more products in the second group with a positive current inventory level to zero.

6. The computer-implemented system of claim 1, wherein distributing the prioritized order quantities comprises:

distributing the prioritized order quantities to the locations based on the current product inventory levels;

determining an exceeded amount of quantities over an inbound capacity of a first location; and

transferring the exceeded amount of quantities to one or more remaining locations.

7. The computer-implemented system of claim 6, wherein transferring the exceeded amount of quantities to the remaining locations comprises transferring the exceeded amount of quantities in equal amounts.

8. The computer-implemented system of claim 6, wherein transferring the exceeded amount of quantities to the remaining locations comprises transferring the exceeded amount of quantities based on a ratio of the order quantities already distributed to each of the remaining locations.

9. The computer-implemented system of claim 1, wherein the instructions further comprise receiving user input of one or more manual orders for a subset of the one or more products.

10. The computer-implemented system of claim 1, wherein generating the purchase orders for a first product comprises:

transmitting the purchase orders to the suppliers including a first supplier;

receiving one or more shipments of the one or more products from the first supplier in response to the purchase orders;

updating the supplier statistics data associated with the first supplier based on the received products;

performing the step for determining the order quantities based on the updated supplier statistics data to obtain a new set of order quantities; and

performing the steps for prioritizing, distributing, and generating purchase orders based on the new set of order quantities.

11. A computer-implemented method performed by at least one processor for intelligent generation of purchase orders, the computer-implemented method comprising:

receiving one or more demand forecast quantities of one or more products, the one or more products corresponding to one or more product identifiers, and the demand forecast quantities comprising a demand forecast quantity for each product for each unit of time;

receiving supplier statistics data for one or more suppliers, the suppliers being associated with a portion of the one or more products;

receiving current product inventory levels and currently ordered quantities of the one or more products;

determining order quantities for the one or more products based at least on the demand forecast quantities, the supplier statistics data, and the current product inventory levels;

prioritizing the order quantities based on one or more supplier-specific parameters updated in a feed forward loop;

distributing the prioritized order quantities to one or more locations;

generating purchase orders to the suppliers for the one or more products based on the distributed order quantities; and

updating the one or more supplier-specific parameters based on the one or more products received in response to the purchase orders.

12. The computer-implemented method of claim 11 further comprising constraining the order quantities, wherein constraining a first order quantity of a first product comprises:

identifying a subset of the suppliers corresponding to the first product;

extracting from the supplier statistics data, past order quantities and actual received quantities for the subset of suppliers;

determining an average fulfillment ratio of the actual received quantities to the past order quantities; and

applying the average fulfillment ratio to the first order quantity.

13. The computer-implemented method of claim 11, wherein a first order quantity of a first product comprises at least one of a sum of demand forecast quantities for the first product over a first period of time and a sum of safety stock quantities for the first product over a second period of time.

14. The computer-implemented method of claim 11, wherein prioritizing the order quantities comprises:

grouping the product identifiers into one or more groups;

determining whether a sum of the order quantities exceeds a sum of inbound capacities of the locations; and

reducing the order quantities until the sum of the order quantities is less than the sum of the inbound capacities.

15. The computer-implemented method of claim 14, wherein reducing the order quantities comprises:

reducing the order quantities of a first subset of the one or more products in a first group with a positive current product inventory level to zero;

reducing the order quantities of a second subset of the one or more products in a second group with zero current product inventory level to one or more minimum quantities determined based on the demand forecast quantities; and

reducing the order quantities of the second subset of the one or more products in the second group with a positive current inventory level to zero.

16. The computer-implemented method of claim 11, wherein distributing the prioritized order quantities comprises:

distributing the prioritized order quantities to the locations based on the current product inventory levels;

determining an exceeded amount of quantities over an inbound capacity of a first location; and

transferring the exceeded amount of quantities to one or more remaining locations.

17. The computer-implemented method of claim 16, wherein transferring the exceeded amount of quantities to the remaining locations comprises transferring the exceeded amount of quantities based on a ratio of constrained order quantities already distributed to the remaining locations.

18. The computer-implemented method of claim 11 further comprising receiving user input of one or more manual orders for a subset of the one or more products.

19. The computer-implemented method of claim 11, wherein generating the purchase orders for a first product comprises:

transmitting the purchase orders to the suppliers including a first supplier;

receiving one or more shipments of the one or more products from the first supplier in response to the purchase orders;

updating the supplier statistics data associated with the first supplier based on the received products;

performing the step for determining the order quantities based on the updated supplier statistics data to obtain a new set of order quantities; and

performing the steps for prioritizing, distributing, and generating purchase orders based on the new set of order quantities.

20. A computer-implemented system for intelligent generation of purchase orders, the system comprising:

a first database storing one or more order histories and one or more demand histories of one or more products, the one or more products corresponding to one or more product identifiers;

a second database storing one or more current product inventory levels and one or more currently ordered quantities of the one or more products, the second database being associated with one or more warehouses configured store the one or more products;

a memory storing instructions; and

at least one processor configured to execute the instructions for:

determining, using the order histories and the demand histories from the first database, one or more demand forecast quantities of the one or more products;

determining, using the order histories from the first database, supplier statistics data of one or more suppliers associated with the one or more products, the supplier statistic data comprising one or more fulfillment ratios associated with the suppliers and the one or more products;

receiving, from the second database, the current product inventory levels and the currently ordered quantities of the one or more products;

determining order quantities for the one or more products based at least on the demand forecast quantities, the supplier statistics data, and the current product inventory levels;

prioritizing the order quantities based at least on the fulfillment ratios;

distributing the prioritized order quantities to one or more locations;

generating purchase orders to the suppliers for the one or more products based on the distributed order quantities;

receiving products at the warehouses in response to the generated purchase orders;

determining the fulfillment ratios using a feed forward loop based on the received products;

updating the supplier statistic data with the determined fulfillment ratios;

performing the step for determining the order quantities based on the updated fulfillment ratios to obtain a new set of order quantities; and

performing the steps for prioritizing, distributing, and generating purchase orders based on the new set of order quantities.