

CLAIMS

What is claimed is:

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 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 products;
receiving current product inventory levels and currently ordered quantities of the products;
determining preliminary order quantities for the products;
constraining the preliminary order quantities to obtain recommended order quantities based at least on the supplier statistics data, the current product inventory levels, and the currently ordered quantities; and
generating purchase orders to the suppliers for the products based on the recommended order quantities.
2. The computer-implemented system of claim 1, wherein the instructions further comprise dividing the product identifiers into one or more categories by:

assigning a subset of the product identifiers with the highest demand forecast quantities to a first category; and
assigning subsequent portions of the product identifiers with the next highest demand forecast quantities to one or more categories.

3. The computer-implemented system of claim 1, wherein the preliminary order quantities comprises at least one of a sum of demand forecast quantities for the products over a first period of time and a sum of safety stock quantities for the products over a second period of time.
4. The computer-implemented system of claim 1, wherein determining the preliminary order quantities further comprises:
receiving a user input of one or more special orders for a subset of the products;
and
increasing the preliminary order quantities corresponding to the subset of the products by quantities specified in the special orders.
5. The computer-implemented system of claim 4, wherein the instructions further comprise flagging one or more product identifiers corresponding to the subset of the products to prevent them from being constrained.

6. The computer-implemented system of claim 1, wherein determining the preliminary order quantities comprises adjusting the demand forecast quantities based on a predetermined ratio configured to balance a risk of overstocking or understocking the products.
7. The computer-implemented system of claim 1, wherein constraining the preliminary order quantities comprises:
extracting from the supplier statistics data, past order quantities and actual received quantities of the products;
determining a fulfillment ratio of the actual received quantities and the past order quantities; and
applying the fulfillment ratio to the preliminary order quantities.
8. The computer-implemented system of claim 7, wherein the fulfillment ratio is applied only to a subset of the products.
9. The computer-implemented system of claim 7, wherein the fulfillment ratio is applied to a first set of preliminary order quantities corresponding to a first set of products based on a first determination that a first number of purchase orders for the first products exceeds a first threshold or a second determination that a second number of purchase orders for corresponding suppliers exceeds a second threshold.

10. The computer-implemented system of claim 1, the instructions further comprise:
transmitting the purchase orders to the suppliers;
receiving one or more shipments of the products in response to the purchase orders;
updating the supplier statistics data based on the received products;
performing the steps for constraining the preliminary order quantities based on the updated supplier statistics data to obtain a new set of recommended order quantities; and
generating purchase orders to the suppliers for the products based on the new set of recommended order quantities.
11. A computer-implemented method for intelligent generation of purchase orders, the method comprising:
receiving one or more demand forecast quantities of one or more products, the 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 products;
receiving current product inventory levels and currently ordered quantities of the products;
determining preliminary order quantities for the products;

constraining the preliminary order quantities to obtain recommended order quantities based at least on the supplier statistics data, the current product inventory levels, and the currently ordered quantities; and generating purchase orders to the suppliers for the products based on the recommended order quantities.

12. The computer-implemented method of claim 11 further comprising dividing the product identifiers into one or more categories by:
assigning a subset of the product identifiers with the highest demand forecast quantities to a first category; and
assigning subsequent portions of the product identifiers with the next highest demand forecast quantities to one or more categories.
13. The computer-implemented method of claim 11, wherein the preliminary order quantities comprises at least one of a sum of demand forecast quantities for the products over a first period of time and a sum of safety stock quantities for the products over a second period of time.
14. The computer-implemented method of claim 11, wherein determining the preliminary order quantities further comprises:
receiving a user input of one or more special orders for a subset of the products;
and

increasing the preliminary order quantities corresponding to the subset of the products by quantities specified in the special orders.

15. The computer-implemented method of claim 14 further comprising flagging one or more product identifiers corresponding to the subset of the products to prevent them from being constrained.
16. The computer-implemented method of claim 11, wherein determining the preliminary order quantities comprises adjusting the demand forecast quantities based on a predetermined ratio configured to balance a risk of overstocking or understocking the products.
17. The computer-implemented method of claim 11, wherein constraining the preliminary order quantities comprises:
 - extracting from the supplier statistics data, past order quantities and actual received quantities of the products;
 - determining a fulfillment ratio of the actual received quantities and the past order quantities; and
 - applying the fulfillment ratio to the preliminary order quantities.

18. The computer-implemented method of claim 17, wherein the fulfillment ratio is applied to a first set of preliminary order quantities corresponding to a first set of products based on a first determination that a first number of purchase orders for the first products exceeds a first threshold or a second determination that a second number of purchase orders for corresponding suppliers exceeds a second threshold.
19. The computer-implemented method of claim 11, further comprising:
 - transmitting the purchase orders to the suppliers;
 - receiving one or more shipments of the products in response to the purchase orders;
 - updating the supplier statistics data based on the received products;
 - performing the steps for constraining the preliminary order quantities based on the updated supplier statistics data to obtain a new set of recommended order quantities; and
 - generating purchase orders to the suppliers for the products based on the new set of recommended 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 products corresponding to one or more product identifiers;

a second database storing one or more product inventory levels and one or more currently ordered quantities of the products, the second database being associated with one or more warehouses configured store the 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 products;
- determining, using the order histories from the first database, supplier statistics data of one or more suppliers associated with the products, the supplier statistics data comprising one or more fulfillment ratios associated with the suppliers and the products;
- receiving, from the second database, the current product inventory levels and the currently ordered quantities of the products;
- determining preliminary order quantities for the products;
- constraining the preliminary order quantities to obtain recommended order quantities based at least on the fulfillment ratios, the current product inventory levels, and the currently ordered quantities;
- generating purchase orders to the suppliers for the products based on the recommended order quantities;
- receiving products at the warehouses in response to the generated purchase orders;
- determining the fulfillment ratios based on the received products;

updating the supplier statistics data with the determined fulfillment ratios;
performing the steps for constraining the preliminary order quantities
based on the updated supplier statistics data to obtain a new set of
recommended order quantities; and
generating purchase orders to the suppliers for the products based on the
new set of recommended order quantities.