

## 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 two or more products, the two or more products corresponding to one or more product identifiers, and the demand forecast quantities comprising a demand forecast quantity for each product of the two or more products for a corresponding unit of time;
    - receiving supplier statistics data for one or more suppliers, the one or more suppliers being associated with a portion of the two or more products;
    - receiving current product inventory levels and currently ordered quantities of the two or more products;
    - dividing the one or more product identifiers into one or more categories by assigning a subset of the one or more product identifiers with the highest demand forecast quantities to a first category and assigning subsequent portions of the one or more product identifiers with the next highest demand forecast quantities to one or more other categories;
    - determining preliminary order quantities for the two or more products, wherein the preliminary order quantities comprises at least one of a sum of the demand forecast quantities for the two or more products over a first period of time and a sum of safety stock quantities for the two or more products over a second period of time;
    - constraining the preliminary order quantities to obtain recommended order quantities based at least on the supplier statistics data, the current product inventory levels, the currently ordered quantities, and the assigned category, wherein constraining the preliminary order

quantities comprises extracting from the supplier statistics data, past order quantities and actual received quantities of the two or more 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;  
generating purchase orders to the suppliers for the two or more products based on the recommended order quantities;  
transmitting the purchase orders to the suppliers;  
receiving one or more shipments of the two or more products in response to transmitting the purchase orders; and  
updating the supplier statistics data based on the received two or more products.

2. 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.
3. The computer-implemented system of claim 2, wherein the instructions further comprise flagging one or more product identifiers corresponding to the subset of the products to prevent them from being constrained.
4. 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.
5. The computer-implemented system of claim 1, wherein the fulfillment ratio is applied only to a subset of the products.

6. The computer-implemented system of claim 1, 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.
7. The computer-implemented system of claim 1, the instructions further comprise:  
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.
8. A computer-implemented method for intelligent generation of purchase orders, the method comprising:  
receiving one or more demand forecast quantities of two or more products, the two or more products corresponding to one or more product identifiers, and the demand forecast quantities comprising a demand forecast quantity for each product of the two or more products for a corresponding unit of time;  
receiving supplier statistics data for one or more suppliers, the one or more suppliers being associated with a portion of the two or more products;  
receiving current product inventory levels and currently ordered quantities of the two or more products;  
dividing the one or more product identifiers into one or more categories by assigning a subset of the one or more product identifiers with the highest demand forecast quantities to a first category and assigning subsequent portions of the one or more product identifiers with the next highest demand forecast quantities to one or more other categories;

determining preliminary order quantities for the two or more products, wherein the preliminary order quantities comprises at least one of a sum of the demand forecast quantities for the two or more products over a first period of time and a sum of safety stock quantities for the two or more products over a second period of time;

constraining the preliminary order quantities to obtain recommended order quantities based at least on the supplier statistics data, the current product inventory levels, the currently ordered quantities, and the assigned category, wherein constraining the preliminary order quantities comprises extracting from the supplier statistics data, past order quantities and actual received quantities of the two or more 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;

generating purchase orders to the suppliers for the two or more products based on the recommended order quantities;

transmitting the purchase orders to the suppliers;

receiving one or more shipments of the two or more products in response to transmitting the purchase orders; and

updating the supplier statistics data based on the received two or more products.

9. The computer-implemented method of claim 8, 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.
10. The computer-implemented method of claim 9 further comprising flagging one or more product identifiers corresponding to the subset of the products to prevent them from being constrained.

11. The computer-implemented method of claim 8, 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.
12. The computer-implemented method of claim 8, 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.
13. The computer-implemented method of claim 8, further comprising:  
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.
14. 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 two or more products, the two or more 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 two or more products, the second database being associated with one or more warehouses configured to store the two 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 two or more products;

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

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

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

determining preliminary order quantities for the two or more products, wherein the preliminary order quantities comprises at least one of a sum of the demand forecast quantities for the two or more products over a first period of time and a sum of safety stock quantities for the two or more products over a second period of time;

constraining the preliminary order quantities to obtain recommended order quantities based at least on the fulfillment ratios, the current product inventory levels, the currently ordered quantities, and the assigned category, wherein constraining the preliminary order quantities comprises extracting from the supplier statistics data, past order quantities and actual received quantities of the two or more 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;

generating purchase orders to the suppliers for the two or more products  
based on the recommended order quantities;  
transmitting the purchase orders to the suppliers;  
receiving one or more shipments of the two or more products at the  
warehouses in response to transmitting the purchase orders;  
determining the fulfillment ratios based on the received two or more  
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 two or more products  
based on the new set of recommended order quantities.