Method for collaborative supply chain management using a network based automated collection and retail system

Description:

FIELD OF THE INVENTION

This invention relates generally to techniques for collaborative supply chain management using a network based automated collection and retail system. More particularly, it relates to methods for measuring the supply chain demand of a specific product based on the summation of “collection demand” and “retail demand”, so as to improve product logistics efficiency and lower costs.

BACKGROUND OF THE INVENTION

Due to the rise of online shopping with the rapid developments of the world wide web, more and more consumers have bought a wide range of products and services online from the Internet.

However, one of the biggest problems and major challenge online retailers currently face, is the high costs of shipping products quickly and safely to consumers. This is especially so for irregular, bulky or heavy items, of which the shipping/postage costs can easily inflates the product costs significantly, making the product not very attractive to the online consumers.

To reduce product logistics costs, some online retailers have set up collection or redemption arrangements for customers to self collect their product purchase from a centralized location. However, high rental, labor and fixed costs are inevitably incurred when a physical outlet is set up for collection or redemption purposes. For online retailers who are unable to sustain the high fixed and operating costs, self collection are more disorganized and have to be arranged with individual customers at a public “rent-free” location at a specific date and time. Without a permanent physical outlet for collection or redemption, these cash-scrapped online retailers can only choose to accept the high shipping/postage costs or they would have to suffer a potential loss of consumer trust and credibility disadvantage due to the disorganized collection arrangements.

Hence, to minimize the logistics costs for online retailers and make the overall product costs much more competitive with minimal shipping costs, it will thus be necessary to improve the current efficiency of the supply chain and minimize the fixed asset utilization costs and labor costs of the logistics process.

This can be done by inventing an automated distribution system which provides collaborative collection services for multiple product suppliers to save fixed/labor costs, and also creates synergies savings by integrating direct retail functions as a secondary process to maximize the overall fixed asset machines utilization rate.

Thus, by managing the logistics supply of products using a network of automated “collaborative” product dispensing machines, the consumer buying behavior and statistics from the transaction records of multiple participating suppliers will allow us to significantly improve product throughput, machine utilization rate and logistics efficiency, as compared to

traditional “independent” product dispensing machines such as vending machines, DVD machines/kiosks, automated retail machines, etc which the consumer can only buy, order or collect products carried by the single independent product dispensing machine operator as it is the sole supplier selecting and selling products by itself. Moreover, using this collaborative automated distribution system will also provides great fixed assets, rental and labor cost savings over traditional retail shops and consignment outlets, which have to incur high fixed and operating costs due to their manual nature.

SUMMARY OF THE INVENTION

The present invention provides a method for collaboratively managing the supply chain of products for one or more suppliers using a network based automated collection and retail system.

An automated distribution system, comprising of one or more product dispensing machines, is used to sell products to consumers through direct retailing, in addition to retrieve information from a network which allows customers to collect products ordered in earlier transactions from one or more specific product suppliers.

A score computation system is then used to rank a specific product as a derived computation of supply chain demand based on the summation of the “collection demand” and “retail demand” measured from the actions of the customers.

By using this invention to share resources, combine and collaboratively manage supply chain demand of multiple suppliers simultaneously, the stock inventory, delivery flow and logistics efficiency of products will be significantly improved, resulting in lower costs for the consumers.

Additional aspects, applications and advantages of the present invention will become apparent upon review of the figures, the detailed description, and the claims which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram that illustrates components of the network based automated collaborative collection and direct retail system in one embodiment of the present invention.

FIG. 2 is a diagram illustrating the current conventional method of managing supply chain demand through individual “collection demand” and “retail demand” of the existing product dispensing machine operator acting as the sole supplier who selects products and sells them directly to consumers independently, in comparison with the method of managing supply chain demand through a collaborative network of multiple suppliers or supplying members to make up “collection demand” in addition to the primary direct “retail demand” of a particular participating product dispensing machine operator in accordance with the present invention.

FIG. 3 is a flow chart illustrating one embodiment of the present invention.

DETAILED DESCRIPTION

The present invention provides a method for collaboratively managing the supply chain of products for one or more suppliers using a network based automated collection and retail

system.

An automated distribution system, comprising of one or more product dispensing machines, is used to sell products to consumers through direct retailing, in addition to retrieve information from a network which allows customers to collect products ordered in earlier transactions from one or more specific product suppliers.

A score computation system is then used to rank a specific product as a derived computation of supply chain demand based on the summation of the “collection demand” and “retail demand” measured from the actions of the customers.

By using this invention to share resources, combine and collaboratively manage supply chain demand of multiple suppliers simultaneously, the stock inventory, delivery flow and logistics efficiency of products will be significantly improved, resulting in lower costs for the consumers.

FIG 1. is a block diagram that illustrates components of the network based automated collaborative collection and direct retail system in one embodiment of the present invention. The ranking system 100 obtains the current transaction information 101 of a specific customer, extracts selected transaction information and acquire the transaction type intent (collection or retail) of the customer to a memory component 102.

In addition, prior transaction information 104 from one or more suppliers of the specific customer are consolidated and stored in a database 105, Selected prior transaction information, product logistics statistics and scoring information are extracted from a database 105 to a memory component 106. This information is then analyzed with the collection or retail information stored in memory component 102, to obtain analysis results 103.

The analysis results 103 can then be used to collect payment, dispense products or redirect customers to other product dispensing machines or alternative sources if the stock run out in machine action component 107. The analysis results 103 is further processed to calculate a score for the specific products by the score computation component 108. The analysis results 103 is then stored in a database 109.

FIG 2. illustrates the current conventional method of managing supply chain demand through individual “collection demand” and “retail demand” of the existing product dispensing machine operator acting as the sole supplier who selects products and sells them directly to consumers independently, in comparison with the method of managing supply chain demand through a collaborative network of multiple suppliers or supplying members to make up “collection demand” in addition to the primary direct “retail demand” of a particular participating product dispensing machine operator in an embodiment of the present invention.

For simplicity of illustration, assume we let f(X) be the function which can calculate and determine supply chain demand, the current conventional method of determining supply chain demand has been carried out separately and independently by individual product dispensing machine operators based on their individual “collection demand” and “retail demand” of the products they select and sell directly to consumers using their own distribution networks.

Thus, we get

$f(X) = f_{collection}(W_1) + f_{retail}(W_1)$

where W_1 = supplier 1 (which is also the product dispensing machine operator),
$f_{collection}(W_1)$ = function of W_1 to calculate “collection demand”,
$f_{retail}(W_1)$ = function of W_1 to calculate “retail demand”

As the product dispensing machine operator is acting as a sole supplier selling direct to consumers, he can keep his supply chain simple to manage by taking in selected products and inventory according to his individual “collection demand” and “retail demand”. The amount of products and inventory the existing product dispensing machine operator can take in is highly dependent on the speed they can sell their products. Thus, large product dispensing machine operators with extensive resources and network can sell much faster than small product dispensing machine operators with limited resources and network. Hence, large product dispensing machine operators can secure products and inventory at a much lower price with their larger MOQs than small product dispensing machine operators.

For the case if the product dispensing machine operator does not provide product collection services to customers (e.g. operators of Drinks Vending Machines, Snacks Vending Machines), then

$f_{collection}(W_1) = 0$,

and the supply chain demand will simply be

$f(X) = f_{retail}(W_1)$

And if the product dispensing machine operator does provide product collection services for its customers who have ordered earlier using its own network (e.g. operators of certain DVD Machines/Kiosks), then

$f_{collection}(W_1)$ = some value,

and the supply chain demand will be

$f(X) = f_{collection}(W_1) + f_{retail}(W_1)$

However, with the current invention, an automated distribution system is provided to allow multiple suppliers to collaborate and manage their individual supply chains together. As product dispensing machines are shared now, suppliers can sell their products through their web pages online or through their other sales channels offline, and then direct their customers to collect their product purchase from any of the participating product dispensing machines in the collaborative automated distribution system. Thus, suppliers do not have to buy or rent product dispensing machines themselves and incur high rental, labor, operating and machine costs. Without the need to become product dispensing machine operators themselves to increase the market reach and sales of their products, smaller suppliers can now secure lower prices with their higher MOQs from their vendors while be able to increase their margins and lower prices for consumers.

Hence, if we let f(X) be the function which can calculate and determine supply chain demand,

we get

$f(X) = f_{collection}(W_1, W_2, W_3 \ldots W_i) + f_{retail}(W_1)$

where W_1 = supplier 1, W_2 = supplier 2, W_3 = supplier 3, W_i = supplier i,
$f_{collection}(W_i)$ = function of W_i to calculate “collection demand”,
$f_{retail}(W_1)$ = function of W_1 to calculate “retail demand”

Thus, for the current conventional method where the existing product dispensing machine operator manage their individual supply chain independently as the sole supplier selling products to consumers,

$W_i = W_1$

$\therefore f(X) = f_{collection}(W_1) + f_{retail}(W_1)$

For the current invention where the product dispensing machine operator is not the only supplier selling to the consumers, then

W_1 = supplier 1 (which can also be the product dispensing machine operator),

W_2 = supplier 2 (Additional supplier 2 who sells products to consumers using their own network but let the consumer collects their product at a participating product dispensing machine of the collaborative automated distribution system),

W_3 = supplier 3 (Additional supplier 3 who sells products to consumers using their own network but let the consumer collects their product at a participating product dispensing machine of the collaborative automated distribution system),

W_i = supplier i (Additional supplier i who sells products to consumers using their own network but let the consumer collects their product at a participating product dispensing machine of the collaborative automated distribution system),

Therefore, as the product dispensing machine is used to ensure full automation when selling direct to the consumers, thus

$f_{retail}(W_1)$ = Amount of products the product dispensing machines can sell directly to consumers (which is equivalent to the function based on supplier 1, the product dispensing machine operator, to calculate “retail demand”)

Hence, if we let the supply chain demand of 1 particular product dispensing machine be

$f_n(X) = f_{collection}(W_1, W_2, W_3 \ldots W_i) + f_{retail}(W_1)$

then we will get

$f_n(X) \propto$ Summation of “collection demand” and “retail demand” at 1 machine
$f_n(X) \propto$ Supply chain demand at 1 machine

For 1 specific product, $f_n(X) \propto$ Score of a specific product computed at 1 particular machine

Hence, to compute the supply chain demand of a network or group of product dispensing machines,

$f(X) = \Sigma a_i f_n(X_i)$,

where i = numbering of each product dispensing machine to be measured in the current supply chain demand computation, a_i = an adjustment factor

Thus, this provides a gauge of measurement for the supply chain demand of a specific product at various product dispensing machines, where a higher score for supply chain demand f(X) implies consumers demand larger numbers of a specific product at certain product dispensing machines as compared to another product with a lower f(X) score.

FIG 3. is a flow chart illustrating one embodiment of the present invention. In block 301, the current transaction information is obtained from a specific customer at a particular product dispensing machine. In block 302, the current transaction information is checked to determine if this is a purchase of a specific product or a collection of one or more products of a prior transaction with a participating supplier of the collaborative automated distribution system. In block 303, if the current transaction is a purchase of a specific product, the transaction is processed and the product is dispensed to the customer.

In block 304, if the current transaction is to collect one or more products of a prior transaction, the prior transaction information is retrieved from a database and processed to dispense the relevant product(s) to the customer. In block 305, the score of each specific product is then computed with respect to the analysis of supply chain demand comprising of the “collection demand” and “retail demand”.

To further enhance the supply chain management of products, improve fixed asset machine utilization and reduce logistics inefficiency, according to one particular embodiment, the transaction information of customers, product logistics, inventory or scoring information obtained from the database is processed to display advertisements on a media platform based on sales records of products and the corresponding availability. This dynamic display of advertisements helps provide consumers with the latest updated market information of products and allows participating suppliers of the collaborative automated distribution system to fine-tune and improve their marketing strategies with updated advertisements based on their real-time sales and inventory statistics.

While particular embodiments according to the invention have been illustrated and described above, those skilled in the art understand that the invention can take a variety of forms and embodiments within the scope of the following claims and their equivalents.

Claims:

What is claimed is:

1. A computer implemented method of distributing products automatically, comprising:

   obtaining the current transaction information of a specific customer, analyzing the current transaction information with relevant information stored earlier in a database; dispensing products to the customer for collection or retail purposes based on the analysis results, storing the transaction information to a database.

2. The method of claim 1, wherein the current transaction information includes:

   the identification information of the customer, the specific products, the transaction type (collection or retail), the time of transaction, the place of transaction or the package attributes of the specific products.

3. The method of claim 1, wherein relevant transaction information stored earlier in a database are prior transaction information customers provide earlier to a database before the current transaction or transaction information of indirect third parties providing gifts or package products relevant to the current transaction.

4. The method of claim 3, wherein customers can submit prior transaction information to one or more suppliers or supplying representatives of the specific products, and

   of which the prior transaction information are consolidated and stored to a database connected to the automated distribution system.

5. The method of claim 1, wherein one or more of the databases in the automated distribution system is connected to a network for real-time analysis of customers' prior and current transaction information.

6. The method of claim 1, wherein dispensing products to customers for collection or retail purposes based on the analysis results includes:

   assigning a higher priority to dispense product if the customer purpose is for collection, and

   keeping a minimum reserve stock level for customers who indicated their collection preferences with their prior transaction information submitted earlier to a database, and

   provide information to customers on other product dispensing machines or alternative sources with available stock if a specific product run out of stock at a particular machine.

7. The method of claim 6, wherein the information provided to customers on other product dispensing machines or alternative sources with available stock are obtained from one or more databases connected to a network based platform.

8. The method of claim 1, wherein a payment platform is provided for customers who have not completed payment settlement from analysis results obtained from the current transaction information and prior transaction information in the database.

9. The method of claim 1, wherein the transaction information stored to the database includes:

   the current transaction information and its payment information.

10. The method of claim 1, further comprising:

    ranking a specific product as a derived computation of supply chain demand based on the summation of “collection demand” and “retail demand” measured from the actions of the customers.

11. The method of claim 10, wherein ranking of a specific product is through a score computation system with scoring results stored in a database, and

    product logistics and inventory for the product dispensing machines are dependent on the specific product score.

12. The method of claim 11, wherein assigning the score of a specific product includes:

    updating the score based on a function dependent on the transaction information of the customers of the specific product.

13. The method of claim 11, further comprising:

    assigning an adjustment factor to a specific product score for product dispensing machines situated at different locations.

14. The method of claim 11, further comprising:

    updating the specific product score based on a function dependent on the scores of other relevant products, and

    of which the relevant products are items that share a set of predetermined similarities and attributes with respect to the specific product.

15. A computer-readable medium that stores instructions executable by a processor or processing device to perform a method for distributing products automatically, comprising:

    instructions for obtaining the current transaction information of a specific customer, analyzing the current transaction information with relevant information stored earlier in a database; dispensing products to the customer for collection or retail purposes based on the analysis results, storing the transaction information to a database.

16. The method of claim 15, wherein the computer-readable medium can be deployed in a

computer operated system or in a product dispensing machine.

17. The method of claim 1, further comprising:

    processing the transaction information of customers, product logistics, inventory or scoring information obtained from the database, and

    displaying advertisements on a media platform based on sales records of products and the corresponding availability.

18. The method of claim 1, wherein a security code can be input manually or electronically to allow a specific customer to collect one or multiple products from the product dispensing machine simultaneously.

19. The method of claim 18, further comprising:

    one or more authentication codes is input manually or electronically to verify the customer and the validity of the security code.

20. The method of claim 18, wherein the specific customer can collect multiple products from one or more independent suppliers in the same transaction simultaneously.