numerical value. By adding the change amount given for each certain period, the similarity of the shipment amount patterns in a predetermined period can be expressed with the magnitude of the numerical value.

[0055] For example, in a case where the shipment amount pattern (Fig. 5) of the item A is "cabbc" and the shipment amount pattern of the item B (comparison target, not illustrated) is "abcba", in the order from the first digits to the fifth digits of the respective character strings, "c" and "a", "a" and "b", "b" and "c", "b" and "b", and "c" and "a" are compared, and predetermined numerical values are given according to the similarity of the labels. By adding the obtained five numerical values, the similarity of the shipment amount patterns between the item A and the item B can be expressed with the numerical value.

[0056] In a case where the feature amount is the shipment amount peak position, it is possible to compare the peak positions of the shipment amount patterns of the item A and the item B in a predetermined period. At this time, it is preferable that the predetermined periods of the item A and the item B are the same period. More specifically, in comparing the peak positions of the shipment amount patterns of the item A and the item B, the time (distance) between the peak position of the item A and the peak position of the item B can be used as the change amount.

[0057] Fig. 6 is an explanatory diagram illustrating an example of feature amount comparison in a case where the feature amount is a shipment amount peak position. In the graph illustrated in Fig. 6, the shipment amount pattern of the item A is indicated by a solid line, and the shipment amount pattern of the item B is indicated by a broken line. In this graph, the shipment amount is put on the vertical axis and time is put on the horizontal axis. By comparing the peak positions of the patterns illustrated in the graph of Fig. 6, it is possible to compare shipment amount peak positions as the

[0065] Fig. 9 is a graph illustrating a shipment amount pattern of the item A0001 and the item A0002 in the vicinity of a predetermined period. In Fig. 9, the shipment amount is put on the vertical axis and time is put on the horizontal axis.

[0066] (Comparison of Shipment Amounts)

With respect to the item A0001 and the item A0002, change amount of the shipment amount is obtained as follows on the basis of the differences D1, D2, and D3 of expected shipment amount on each day from December 25, 2017 to December 27, 2017 as the predetermined period.

$$[(D1)^2 + (D2)^2 + (D3)^2]^{1/2}$$

$$= [|11 - 20|^2 + |1 - 7|^2 + |2 - 6|^2]^{1/2}$$

$$\approx 11.5$$

[0067] (Comparison of Shipment Amount Patterns)

With respect to the item A0001 and the item A0002, the shipment amount patterns from December 22, 2017 to December 30, 2017 as a predetermined period are compared. Herein, the certain period in the case of analyzing the shipment amount pattern is three days. Fig. 10 is an explanatory diagram of analysis results of shipment amount patterns of the item A0001 and the item A0002. As illustrated in Fig. 10, the shipment amount pattern of the item A0001 is given a label on the basis of the shipment amount in each certain period and can be expressed as "bac". As illustrated in Fig. 10, the shipment amount pattern of the item A0002 is given a label on the basis of the shipment amount in each certain period and can be expressed as "bba".

[0068] Fig. 11 is a chart illustrating the similarity between labels in the comparison of shipment amount patterns. For the item A0001 and the item A0002, the corresponding labels in each certain period are "b" and "b", "a" and "b", and "c" and

CLAIMS

1. An inventory placement system comprising:

a grouping means acquiring a plurality of feature amounts for each of a plurality of items from shipment data related to the plurality of items,

comparing each of the feature amounts acquired for a certain item with each of the feature amounts acquired for other items and calculating a change amount between the corresponding feature amounts, and

classifying the plurality of items into a plurality of item groups on the basis of a magnitude of the calculated change amount;

a shipment predicting means acquiring a past shipment record for each of the items from the shipment data and predicting shipment amounts of the plurality of items on the basis of the acquired shipping record; and

a placement determining means determining a placement for each of the classified item groups and a placement of the plurality of items on the basis of the shipment prediction by the shipment predicting means,

wherein, in a case where a size and/or weight of the item is outside a predetermined range, the grouping means classifies the plurality of items into a plurality of item groups on the basis of the size and/or weight of the item in addition to the basis of the magnitude of the calculated change amount.

2. The inventory placement system according to claim 1, wherein the feature amounts are two or more of a shipment amount of the items, a temporal change in the shipment amount of the items, and a position of a maximum peak of the temporal change in the shipment amount of the items.

3. The inventory placement system according to claim 2,

wherein, in a case where one of the plurality of the feature amounts is the temporal change in the shipment amount, in comparison between the temporal change in the shipment amount of a certain item and the temporal change in the shipment amount of other items,

a pattern of the acquired temporal change in the shipment amount is smoothed at every certain period,

the temporal change is divided into a plurality of sections at each of the certain period in accordance with a value smoothed at each of the certain period,

the section of the temporal change in the shipment amount for a certain item is compared with the sections of the temporal change in the shipment amount of other items at each corresponding certain period, and

a sum of change amounts determined according to a similarity between the compared sections is obtained as a change amount of the temporal change of the shipment amount as the feature amount.

4. The inventory placement system according to any one of claims 1 to 3, wherein a total change amount of the feature amount between the items is obtained by adding each of the change amounts of the feature amounts multiplied by a coefficient, and a plurality of the items are classified into a plurality of the item groups on the basis of the total change amount.

5. The inventory placement system according to any one of claims 1 to 4, wherein the placement determining means has a configuration in which a plurality of computers is connected, and

the computers determine the placement of each of the item groups and the placement of the plurality of items for one or more of the plurality of item groups classified by the grouping means.

6. The inventory placement system according to any one of claims 1 to 5, wherein the placement determining means determines the placement of the items in an order from an item group having a larger representative value of the shipment amount and/or shipment frequency for each of the item groups among the plurality of item groups.

7. An inventory placement method comprising:

a grouping step acquiring a plurality of feature amounts for each of a plurality of items from a shipment data related to the plurality of items,

comparing each of the feature amounts acquired for a certain item with each of the feature amounts acquired for other items and calculating a change amount between the corresponding feature amounts, and

classifying the plurality of items into a plurality of item groups on the basis of a magnitude of the calculated change amount;

a shipment predicting step predicting shipment amounts and shipment timings of the plurality of items; and

a placement determining step determining a placement for each of the classified item groups and a placement of the plurality of items on the basis of a shipment prediction in the shipment predicting step

wherein, in a case where a size and/or weight of the item is outside a predetermined range, the plurality of items are classified into a plurality of item groups

on the basis of the size and/or weight of the item in addition to the basis of the magnitude of the calculated change amount in the grouping step.

8. An inventory placement program allowing a computer to function as:

a grouping means acquiring a plurality of feature amounts for each of a plurality of items from a shipment data related to the plurality of items,

comparing each of the feature amounts acquired for a certain item with each of the feature amounts acquired for other items and calculating a change amount between the corresponding feature amounts, and

classifying the plurality of items into a plurality of item groups on the basis of a magnitude of the calculated change amount;

a shipment predicting means predicting shipment amounts and shipment timings of the plurality of items; and

a placement determining means determining a placement for each of the classified item groups and a placement of the plurality of items on the basis of the shipment prediction by the shipment predicting means,

wherein, in a case where a size and/or weight of the item is outside a predetermined range, the grouping means classifies the plurality of items into a plurality of item groups on the basis of the size and/or weight of the item in addition to the basis of the magnitude of the calculated change amount.