Method and system for collecting and processing of inventory data of retail outlets

FIELD OF THE INVENTION

The present invention relates to a method for collecting and processing data, a server system for collecting and processing data, and a computer program element for collecting and processing data. More specifically the invention relates to collecting and processing inventory data of retail outlets.

BACKGROUND

Products are typically sold via retail outlets to customers. The number of products sold is an important key performance indicator for retail outlets. Typically a retail outlet keeps track of the flow of products by collecting inventory information and storing the information in a database system. Upon delivery of products and when products are sold the database is updated. Modern retail outlets use automated systems with barcode scanners for scanning products on delivery and computer implemented cashiers coupled to the database system for automatically updating the database.

Key performance indicator statistics can be generated for a retail outlet by processing the data stored in the database. For a group of retail stores belonging to a single owner, database systems are typically coupled or a central database is used. Group statistics can be generated for the group of retail outlets.

SUMMARY OF THE INVENTION

It is an object of the invention to provide an improved method and system for collecting and processing inventory data from retail outlets.

The object is achieved by the method for collecting and processing outlet data, the server system for collecting and

processing outlet data, and the computer program element having the features as defined in the independent claims.

According to an aspect of the invention a method is provided for collecting and processing outlet data. The method is used in a server system that is communicatively linked to one or more mobile terminals and to one or more client systems. The server system comprises a database with retail outlet data. The method comprises the step of receiving inventory data from the mobile terminal. The inventory data indicates an availability of a product in a retail outlet. The method further comprises the step of receiving supplementary data from the mobile terminal. The supplementary data comprises location information data, date-and-time data and identifier data. The location information typically comprises GPS (Global Positioning System) data from a GPS module in the mobile terminal. The method further comprises the steps of selecting target outlet data by matching the location information data with the retail outlet data, and storing the inventory data, the data-and-time data and the identifier data with the target outlet data in the database. The method further comprises the step of receiving an information request from the client system. The method further comprises the steps of retrieving the target outlet data from the database and processing the target outlet data in accordance with the information request. The method further comprises the step of transmitting processed target outlet data from the server system to the client system.

According to an aspect of the invention a server system is provided for collecting and processing outlet data. The server system is communicatively linked to one or more mobile terminals and one or more client systems. The server system comprises a database with retail outlet data. The server system further comprises a first receiver configured for receiving inventory data and supplementary data from the mobile terminal. The inventory data indicates an availability of a product in a retail outlet. The supplementary data comprises a location information data, a date-and-time data and an identifier data. The location information typically comprises GPS (Global Positioning

System) data from a GPS module in the mobile terminal. The server system further comprises a first query means configured for selecting target outlet data by matching the location information data with the retail outlet data. The server system further comprises a storing means configured for storing the inventory data, the data-and-time data and the identifier data with the target outlet data in the database. The server system further comprises a second receiver configured for receiving an information request from the client system. The server system further comprises a second query means configured for retrieving the target outlet data from the database. The server system further comprises a processor configured for processing the target outlet data in accordance with the information request. The server system further comprises a first transmitter configured for transmitting a processed target outlet data to the client system.

Thus the invention enables a centralized storage and processing of collected inventory data, supplemented with supplementary data. The supplementary data enables advanced tracking of when, where and by whom the inventory data is collected. Advantageously inventory data of any retail outlet for which retail outlet data is available in the database can be collected and processed. Advantageously the inventory data is collected using a mobile terminal with a location determination module such as a GPS module, enabling retail outlet independent collection of inventory data, i.e. the collection of inventory data is independent of inventory systems like bar-code systems used in the retail outlet, and automatic matching of the target retail outlet with the inventory data. The target outlet data is processed and transmitted to a client system, advantageously enabling the client system to receive advanced statistical data. Typically the processed outlet data is provided using web-based technology.

The embodiments of claims 2 and 9 advantageously enable inclusion of digital picture data in the processed target outlet data. Typically the digital picture data is included in web-

based statistical data to visualize the layout of products in the target outlet.

The embodiments of claims 3 and 10 advantageously enable the mobile terminnal to be triggered by the server system and receive instructions.

The embodiments of claims 4 and 11 advantageously enable generation of advanced statistical data for the client system.

The embodiments of claims 5 and 12 advantageously enable generation of advanced statistical data for the client system.

The embodiments of claims 6 and 13 advantageously enable the planning of a route the mobile terminal has to follow for efficient collection of inventory data of various retail outlets. Moreover, the mobile terminal can advantageously be tracked.

The embodiments of claims 7 and 14 advantageously enable a more efficient planning of the route by taking into account the availability of the employee operating the mobile terminal.

According to an aspect of the invention a program element is provided which, when being executed by a processor, is adapted to carry out a method for collecting and processing outlet data having one ore more of the above mentioned features in a server system having one or more of the above mentioned features. This advantageously enables the server system to be implemented partly or as a whole in software.

The invention will be further illustrated with reference to the attached drawings, which schematically show preferred embodiments according to the invention. It will be understood that the invention is not in any way restricted to these specific and preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be explained in greater detail by reference to exemplary embodiments shown in the drawings, in which:

Fig.1 shows a simplified architecture of an exemplary embodiment of the invention;

Fig.2 shows a server system of an exemplary embodiment of the invention;

Fig.3 shows the steps of a method of an exemplary embodiment of the invention;

Fig.4 shows the steps of a method of an exemplary embodiment of the invention;

Fig.5 shows sub-steps of a method of an exemplary embodiment of the invention;

Fig.6 shows a geographical representation of retail outlet data stored in a database of an exemplary embodiment of the invention;

Fig.7 shows a geographical representation of retail outlet data stored in a database of an exemplary embodiment of the invention;

Fig.8 shows a graphical representation of an information request for route planning data of an exemplary embodiment of the invention;

Fig.9 shows a graphical representation of processed target outlet data comprising route planning data and a geographical representation of the route planning data of an exemplary embodiment of the invention; and

Fig. 10 shows a graphical representation of processed target outlet data comprising key performance indicator data for a geographical brand distribution of an exemplary embodiment of the invention.

DETAILED DESCRIPTION

The invention enables companies to measure the efforts they make at retail outlets, or any other point-of-sale, and use the results of the measurements to better manage the performance of their sales teams. Numerous key performance indicators can be measured, including - but not limited to - brand distribution, share of main shelf, product facings, product position on shelf, product freshness, secondary display availability, enticing shoppers, connecting with shoppers, serving shoppers, closing

the sale, order volume, call frequency compliance, call route compliance and order-strike rate.

The invention provides a technical solution for collecting and processing outlet data, enabling the above mentioned measurement of key performance indicators. A central server system is used to collect inventory information from retail outlets, process the collected information, and provide the processed information to client systems.

In Fig.1 a simplified architecture is show, wherein server system 1 is communicatively linked to one or more mobile terminals 2,3,4. The mobile terminal 2,3,4 is used to collect inventory data from the retail outlet. The mobile terminal 2,3,4 is e.g. a mobile phone, pda or laptop. To collect inventory data an auditor operating the mobile terminal 2,3,4 visits the retail outlet and enters audit data, such as e.g. a number of particular products in the retail outlet or the location of a product in the retail outlet, into a digital form on the mobile terminal 2,3,4. The digital form is e.g. provided by an audit software program running on the mobile terminal or via a web page coming from the server system 1. The location of the mobile terminal 2,3,4 is tracked by the server system 1. Hereto the mobile terminal 2,3,4 is equipped with a GPS (Global Positioning System) module. Alternatively any other location tracking system can be used, such as network-based mobile positioning. If the mobile terminal is equipped with a digital camera, it is possible to include a digital picture of e.g. the product or the placement of the product on a shelf with the supplementary data. Upon completion of the audit the inventory data is transmitted to the server system 1. Supplementary data including location information data, date-and-time data (i.e. the current date and time), identifier data (identifying the auditor or the mobile terminal) and possibly digital picture data is also transmitted to the server system 1. It is possible to have software on the mobile terminal 2,3,4 check the inventory data before transmission to the server system 1. If there are obvious errors in the inventory data, such as e.g. a negative number of products, the

auditor is requested to correct the mistake by presenting a message on the display of the mobile terminal 2,3,4.

Server system 1 uses a database to store inventory data of numerous retail outlets. The database contains for each retail outlet retail outlet data, comprising e.g. the name, location and owner of the retail outlet. The inventory data and supplementary data received from the mobile terminal 2,3,4 are stored in the database together with the retail outlet data. The retail outlet for which the inventory data is collected is called the target retail outlet. The target outlet can found in the database by using the location information data received with the supplementary data and matching this location information data with the location information stored in the database.

The data stored in the database is used to generate advanced statistics and provide information about key performance indicators. A client system, indicated in Fig.1 as 5, 6 and 7, can request information from the server system 1. Typically this request is placed using a web interface, i.e. a web browser on the client system 5,6,7 connects to a web server on the server system 1.

In Fig.2 elements of an exemplary embodiment of server system 1 are shown. It will be understood that it is possible to implement the server system 1 by combining one or more elements and/or by having different interconnections between the elements. A first receiver 11 is receives the inventory data and supplementary data from the mobile terminal 2,3,4. It is possible to have the server system 1 transmit a request for the inventory data to the mobile terminal 2,3,4 first. In this case the server system 1 has a second transmitter 18 configured for transmitting the instruction data to the mobile terminal 2,3,4. First query means 12 selects the target outlet data in the database 10 using the location information data received with the supplementary data. Storing means 13 stores the inventory data, together the date-and-time data and identifier data, with the target outlet data in the database 10. Inventory data that is received for this target outlet at a later stage will be added with the new date-and-time data to the target outlet data. The

time stamped data can be used to generate statistics and key performance indicator data over time. Second receiver 14 receives information requests from client systems 5,6,7. Processor 16 processes the information request. Through second query means 15 target outlet data is retrieved from database 10 and processor 16 processed the target outlet data by generating statistics and key performance indicator data. The processed target outlet data is transmitted through first transmitter 15 to the client system 5,6,7.

In Fig.3 an exemplary embodiment of a method for use in server system 1 is shown. In step 100 the inventory data and supplementary data are received. In step 101 the target outlet data is selected from the database 10 by matching the location data received from the mobile terminal 2,3,4 with location information stored in the database 10 for the retail outlets. The inventory data and supplementary data is stored with the target outlet data in step 102. In step 103 an information request is received from a client system 5,6,7. Target outlet data is received from database 10 in step 104 and processed in step 105. In step 106 the processed target outlet data is transmitted to the client system 5,6,7.

Fig.4 shows an exemplary embodiment of the invention, which is based on Fig.3, but has the additional step of transmitting 107 instruction data to the mobile terminal 2,3,4 to trigger the auditor to start collecting inventory data. When the mobile terminal is equipped with a digital camera, step 100 where supplementary data is received optionally includes receiving digital picture data. This is indicated with step 100a. Step 102 where the supplementary data is stored in the database 10 then optionally includes the step of storing 102a the digital picture data with the target outlet data in the database.

It is possible to store data about employee availability in the database. This employee availability data can be used when planning a route the auditor has to travel for visiting numerous retail outlets for collecting inventory data. This option will be further elaborated with Fig.8 and Fig.9. In Fig.4 the step of storing employee availability data is indicated in step

108. It will be understood that step 108 can be performed any time.

The statistics and key performance indicator data that is transmitted to the client system 5,6,7 is triggered by the request received from the client system 5,6,7. Optionally the server system 1 generates the statistics beforehand and provides the data when the client system 5,6,7 connects to the server system 1. In the latter case the connection of the client system 5,6,7 to the server system 1 can be equivalent to the request for information. In either case target outlet data is retrieved from the database 10 and processed. If statistics and key performance indicator data is to be generated covering more than one retail outlet, then target outlet data is retrieved for each of the covered retail outlet.

A client using the client system 5,6,7 typically wants to receive key performance indicator data and a graphical representation of the key performance indicator data. Hereto the server system 1 generates the key performance indicator data and graphical representation of the key performance indicator data, as illustrated in Fig.5 in steps 1050 and 1051. Key performance indicator data typically comprises one or more of the following data elements: a number of retail outlets in a predefined geographical area, a number of retail outlets in a predefined channel, a number of retail outlets in an account, a geographical brand distribution, a number of available products in a retail outlet, a number of available products on a predefined location in a retail outlet, or a location of a product in a retail outlet. The inventory data and supplementary data collected by the auditors using the mobile terminal 2,3,4 and stored with the retail outlet data in the database 10 of server system 1 provides the input for calculating these data elements. The key performance data is presented to the client system 5,6,7 as geographical map data, table data, chart data and/or digital picture data. Geographical map data is e.g. presented as a map of a country or of a city with an overlay of information at geographical locations on the map. Table data is a structured presentation of data in columns and rows. Chart data is a two-

dimensional chart with x-axis and y-axis or a three-dimensional chart with x-axis, y-axis and z-axis to represent data, e.g. over time. Digital picture data is presented as a picture or thumbnail of a picture as taken with the mobile terminal 2,3,4 and stored in the database 10. The digital picture can be presented as such, or as part of the geographical map, table data or chart data.

To provide the client system 5,6,7 with comparative statistics and key performance indicator data, the server system 1 optionally generates the key performance indicator data for two or more predefined time frames. In Fig.5 this is indicated by step 1052. Date-and-time data stored with the target outlet data is used to retrieve the data for the predefined time frame. For different time frames a change in the key performance indicator data is calculated, as indicated by step 1053. The change is presented to the client-system, whereby a graphical representation data is used to visualise the change. The graphical representation data is e.g. a small bitmap or icon indicating a change up, down or flat. The significance of the change is indicated as well, e.g. by using the colours green, yellow and black indicating a high, low or no significance on the bitmap or icon. The significance is calculated using a predefined calculation rule, e.g. more than 100% change is high significance; 50%-100% is low significance; below 50% is no significance.

To provide the client system 5,6,7 with route planning information, the server system 1 optionally generates route planning data. This is indicated by step 1054 in Fig.5. Route planning information is used to plan the route that an auditor has to travel to cover numerous retail outlets for collecting inventory data. Optionally the route planning information is used to track the mobile terminal 2,3,4 and the performance of the auditor. Geographical map data is generated in step 1055. This geographical map data is e.g. represented as a map of a city with an overlay of retail outlets and the route to travel efficiently between the stores. When taking into account the employee availability data as stored in the database 10 in step

108 of Fig.4, the route planning data can be calculated over time more accurately. This is indicated in Fig.5 by step 1054a.

It will be understood that the order of the steps as shown in Fig.5 is not fixed and not all steps need to be performed.

In Fig.6 an example of a representation of geographical map data of retail outlet data stored in the database 10 is shown. A map 20 of China is shown with an overlay of retail outlets 21. Each dot represents a retail outlet 21. The retail outlets 21 shown are e.g. all retail outlets in the database 10 or retail outlets belonging to an account or channel. The geographical representation of Fig.6 is transmitted to the client system 2,3,4 as a bitmap or as data enabling the client system 2,3,4 to generate the geographical representation.

In Fig.7 another example of a representation of geographical map data of retail outlet data is shown. A map 22 of a city is shown with an overlay of retail outlets. Retail outlets on this map appear to be concentrated in groups, as indicated by e.g. circles 23a and 24. These circles are generated by the server system 1 and provide visual information about the concentration of retail outlets. The large group of retail outlets indicated by 23a is also presented enlarged as indicated by 23b.

For planning the route of an auditor, the server system 1 can provide the client system 2,3,4 with a clickable map, as indicated in Fig.8 by 25. Clickable map 25 is e.g. a zoomed-in version of 23b, but it can also be any other map. Fig.8 is an example of a webpage as presented on the display of the client system 2,3,4. The webpage is transmitted from the server system 1 to the client system 2,3,4 as a result of an earlier request for information. The request for information e.g. comprised a request to show all retail outlets of a particular channel in a part of the city. By using mouse and/or keyboard several retail outlets 26 are selected. Each dot on map 25 represents a retail outlet 26. The selection is made by dragging the mouse around a number of retail outlets 26, resulting in area 27 being drawn. The selected retail outlets are automatically filled-in in selection box 29. Alternatively the retail outlets are filled-in

in box 29 by using the keyboard. In selection box 28 the identity of the auditor can be filled in. By clicking button 30 the selection is transmitted to server system 1 as a new information request.

In response to the information request resulting from clicking button 30, the server system 1 generates (step 1054) route planning data and geographical map data (step 1055) comprising a graphical representation of the route planning data. In Fig.9 the route planning data as presented to the client system 2,3,4 is shown. The graphical representation 31 provides a map with an overlay of retail outlets S1-S13 and a route 32 between the retail outlets. The retail outlets S1-S13 are also presented in rows of table 33, including a first column with a clickable icon to delete a retail outlet from the planned route, a second column with the sequence number (1-13) of the retail outlet S1-S13, a third column with an identity of the retail outlet, a fourth column with an identifier of a channel the retail outlet belongs to, and a fifth column indicating the planned time on-site for the auditor 28. In table 34 the total time to be spend by the auditor 28 per channel is summed. In this example table 33 includes retail outlets of two channels, resulting in two rows in table 34. The first column of table 34 indicated the channel, the second column indicates the number of retail outlets for this channel, the third column is the sum of planned time on-site in minutes, and the fourth column indicates the planned time on-site in days. When the auditor is actually collecting inventory data with the mobile terminal 2,3,4, the client system 5,6,7 can be used to track the auditor and follow the planning.

In Fig.10 an example of a graphical representation of processed target outlet data is shown. In Fig.10 key performance indicator data for a geographical brand distribution is shown as a map of a geographical area with an overlay of coloured sub-areas indicating a contribution coverage for a brand of a product. Geographical area 35 shows e.g. the brand distribution for competitor A. Geographical area 36 shows e.g. the brand distribution for the client using the client system 2,3,4.

Geographical area 37 shows e.g. the brand distribution for competitor B. This key performance indicator data can e.g. be used by the client to decide where to increase and where to decrease promotional activity for the product.

Planning of audits as illustrated by Fig.8 and Fig.9 can be done in cycles of e.g. four consecutive weeks. During this four week an auditor will collect inventory data using the mobile terminal 2,3,4 along the planned routes. The auditor is tracked using the location information received with the supplementary data.

It is possible to add data to the database 10 using a human operated input terminal. Modification to retail outlet data or inventory data can e.g. be provided by fax, email or telephone to the human operator, who subsequently transmits the data to the server system 1 using the input terminal.

Preferably an auditor who is planned to collect inventory data operates the mobile terminal 2,3,4. It is possible that other persons operate the mobile terminal 2,3,4, e.g. the owner of a retail outlet. To prevent misuse of the mobile terminal 2,3,4 it is possible to add security measures such as a pin-code for activating the mobile terminal 2,3,4, or a pin-code for accessing the server system 1.

It is possible that the method according to the invention is partially or as a whole implemented as a program element. Hereto the server system 1 has a processor for executing the program element. Server system 1 is then e.g. a server on which software implementing the invention is loaded.

CLAIMS

1. A method for collecting and processing outlet data, the method for use in a server system that is communicatively linked to one or more mobile terminals and to one or more client systems, the server system comprising a database with retail outlet data, the method comprising the steps of:

receiving (100) inventory data and supplementary data from the mobile terminal, the inventory data indicating an availability of a product in a retail outlet, the supplementary data comprising location information data, date-and-time data and identifier data;

selecting (101) target outlet data by matching the location information data with the retail outlet data, and storing (102) the inventory data, the date-and-time data and the identifier data with the target outlet data in the database;

receiving (103) an information request from the client system;

retrieving (104) the target outlet data from the database and processing (105) the target outlet data in accordance with the information request; and

transmitting (106) processed target outlet data to the client system.

2. The method according to claim 1, the method further comprising the steps of receiving (100a) digital picture data with the supplementary data and storing (102a) the digital picture data with the target outlet data in the database.

3. The method according to claim 2, further comprising the steps of transmitting (107) instruction data to the mobile terminal, the instruction data comprising a request for the inventory data.

4. The method according to any of the preceding claims, wherein the step of processing (105) the target outlet data comprises the steps of:

generating (1050) key performance indicator data comprising one ore more of the following data elements: a number of retail outlets in a predefined geographical area, a number of retail outlets in a predefined channel, a number of retail outlets in an account, a geographical brand distribution, a number of available products in a retail outlet, a number of available products on a predefined location in a retail outlet, or a location of a product in a retail outlet; and

generating (1051) graphical representation data of the key performance indicator data, the graphical representation data comprising one or more of the following data elements: geographical map data, table data, chart data, or the digital picture data.

5. The method according to claim 4, wherein the step of processing (105) the target outlet data further comprises the steps of generating (1052) the key performance indicator data for two or more predefined time frames and calculating (1053) a change in the key performance indicator data, and wherein the graphical representation data comprises change indicator data indicating whether the change is up, down or flat and indicating the significance of the change based on a predefined calculation rule.

6. The method according to any of the preceding claims, wherein the step of processing (105) the target outlet data comprises the steps of generating (1054) route planning data and generating (1055) geographical map data comprising a graphical representation of the route planning data.

7. The method according to claim 6, further comprising the steps of storing (108) employee availability data in the database and calculating (1054a) the route planning data using the employee availability data.

8. A server system (1) for collecting and processing outlet data, the server system (1) being communicatively linked

to one or more mobile terminals (2,3,4) and to one or more client systems (5,6,7), the server system (1) comprising:

a database (10) with retail outlet data;

a first receiver (11) configured for receiving inventory data and supplementary data from the mobile terminal (2,3,4), the inventory data indicating an availability of a product in a retail outlet, the supplementary data comprising location information data, date-and-time data and identifier data;

a first query means (12) configured for selecting target outlet data by matching the location information data with the retail outlet data;

a storing means (13) configured for storing the inventory data, the date-and-time data and the identifier data with the target outlet data in the database (10);

a second receiver (14) configured for receiving an information request from the client system (5,6,7);

a second query means (15) configured for retrieving the target outlet data from the database (10);

a processor (16) configured for processing the target outlet data in accordance with the information request; and

a first transmitter (17) configured for transmitting processed target outlet data to the client system (5,6,7).

9. The server system (1) according to claim 8, wherein the supplementary data further comprises digital picture data.

10. The server system (1) according to claim 8 or claim 9, further comprising a second transmitter (18) configured for transmitting instruction data to the mobile terminal (2,3,4), the instruction data comprising a request for the inventory data.

11. The server system (1) according to any of the claims 8-10, wherein the processor (16) is configured for:

generating key performance indicator data comprising one ore more of the following data elements: a number of retail

outlets in a predefined geographical area, a number of retail outlets in a predefined channel, a number of retail outlets in an account, a geographical brand distribution, a number of available products in a retail outlet, a number of available products on a predefined location in a retail outlet, or a location of a product in a retail outlet; and

generating graphical representation data of the key performance indicator data, the graphical representation data comprising one or more of the following data elements: geographical map data, table data, chart data, or the digital picture data.

12. The server system (1) according to claim 11, wherein the processor (16) is further configured for generating the key performance indicator data for two or more predefined time frames and for calculating a change in the key performance indicator data, and wherein the graphical representation data comprises change indicator data indicating whether the change is up, down or flat and indicating the significance of the change based on a predefined calculation rule.

13. The server system (1) according to any of the claims 8-12, wherein the processor (16) is further configured for generating route planning data and for generating geographical map data comprising a graphical representation of the route planning data.

14. The server system (1) according to claim 13, wherein the storing means (13) is further configured for storing employee availability data in the database (10) and the processor (16) is configured for generating the route planning data using the employee availability data.

15. A computer program element, which, when being executed by a processor, is adapted to carry out a method for collecting and processing data according to any of the claims 1-7 in a server system according to any of the claims 8-14.