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(54) **COMPUTERIZED METHOD AND SYSTEM FOR AUTOMATING REWARDS TO CUSTOMERS**

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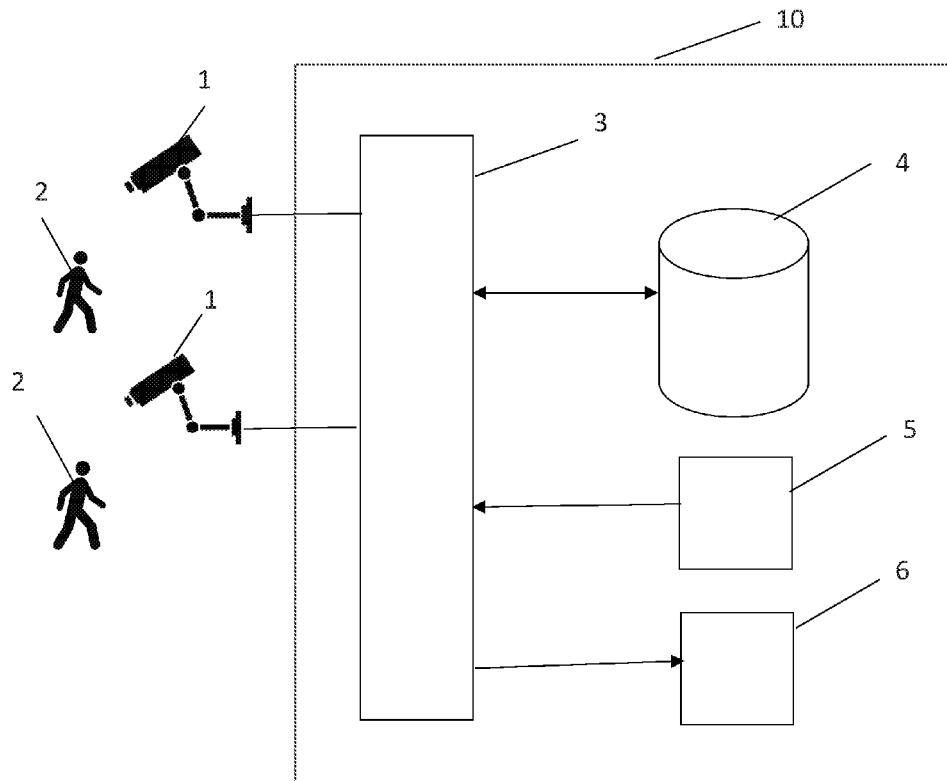CPC *G06Q 30/0207* (2013.01); *H04L 67/18* (2013.01); *G06F 17/30477* (2013.01); *G06F 17/30312* (2013.01); *G06K 9/00335* (2013.01); *G06K 9/00288* (2013.01)

(57) **ABSTRACT**

A computerized reward mechanism system is proposed which makes use both of presently collected data relating to the customer, and a database of historical data relating to the customer. Using this information, the system performs a customer preference analysis, which results in selecting rewards which are adapted to the customers' personal needs. In one form, the system is positioned at a shopping center, and includes cameras for recognising past customers by image processing. This may be done without requiring customers to participate in a process of signing up to use the system. The presently collected data include responses to questions put to the customer relating to his present shopping experience. Customer honesty is considered in the step of determining which rewards to offer the consumer, to encourage the consumers to express their feelings more clearly.
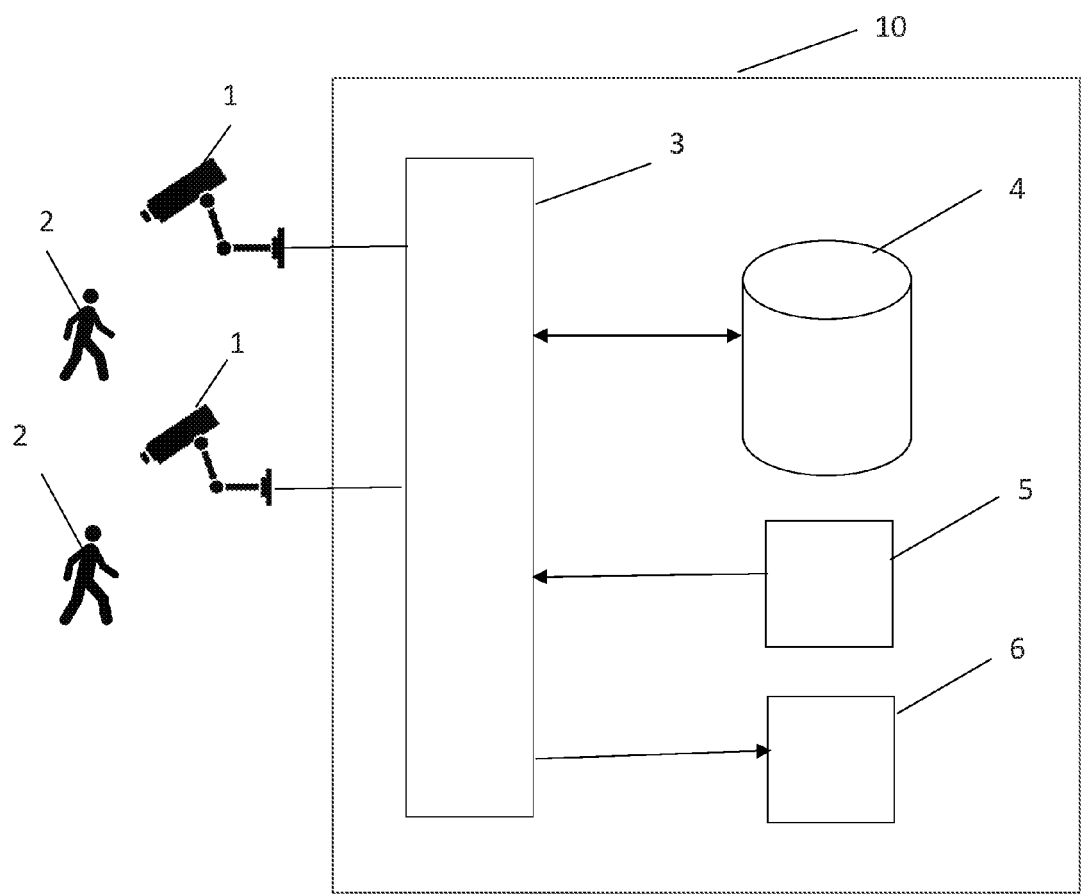
FIG. 1

Capture facial
images   21

Recognise faces   22

Retrieve historical
data   23

Select customers to
reward   24

Current data
collection and
analysis   25

Select reward   26

Fig. 2

COMPUTERIZED METHOD AND SYSTEM FOR AUTOMATING REWARDS TO CUSTOMERS

FIELD OF THE INVENTION

[0001] The present invention relates to automated methods and systems for selecting which of a plurality of rewards to offer to a customer of at least one retailer, which may be an individual or a commercial organisation.

BACKGROUND OF THE INVENTION

[0002] There is a long tradition of retailers providing their customers with rewards to encourage them to place an order with the retailer, or encourage them use the retailer again. One traditional reward mechanism is to allow customers to accumulate points to earn goods. A loyalty program is a typical example [1]. The customers are provided with a particular type of card (e.g., a loyalty card, a rewards card, a point card, an advantage card, or a club card), often with barcodes or magstripes on them. By presenting the cards, the customers can enjoy either a discount on the current purchase, or accumulate points that can be used for future purchases. An alternative is to provide customers with "one-time" rewards, such as giving the customers gifts or vouchers, or entering the customers into a lucky draw

[0003] From the retailer's point of view, the rewarding mechanisms can encourage the customers to conduct more shopping, and thus raise the retailer's profits. For example, although the customers can use the points to redeem products, or enjoy discounts, the point accumulation needs a long-term shopping period, so it only will not have significant costs to the retailer if the customers use the retailers repeatedly over that period. For the one-time rewards, e.g., a lucky draw, the customers need to spend a minimum amount of money to get the reward.

[0004] Although customers do benefit from a loyalty scheme, the behaviour needed to accumulate points requires behaviour which they have to passively accept. For example, when they have become members of a program organised by a certain retailer, they will only benefit if they go back to the same retailer for their shopping; or they have to redeem their points before a certain expiration date. Therefore, customers are often incentivized to redeem their points as soon as possible. On the other hand, one-time rewards are often less than satisfactory. The vouchers often carry conditions (e.g. they can only be used on certain products which the customers do not want to buy), or the gifts are not what they need, so customers do not feel happy when they receive vouchers or gifts that do not match their personal needs. An additional disadvantage of both reward mechanisms is that in order to participate users usually have to complete a registration process, and provide private information they may prefer not to give, such as their name, IC number and contact number.

[0005] Therefore, the existing rewarding mechanisms do not provide a great enough incentive to make existing customers more loyal, or attract new loyal customers. The major reason for this is that the traditional rewarding mechanisms are not adapted to the customers' personal needs. The uniform rewards applicable to one-time rewards do not benefit all customers, while loyalty programs make the customers feel that they are forced passively to accept behaviour dictated by the retailer, instead of being encouraged.

[0006] WO 2011/1460554 [7] proposes an automated system to accumulated customer rewards, but the system requires that the user supplies a unique identifier. The selection of a reward is made by the customer himself or herself.

SUMMARY OF THE INVENTION

[0007] The present invention aims to provide a customer rewarding mechanism which benefits the customers and encourages them to conduct more shopping.

[0008] In general terms, the invention proposes that a computerized reward mechanism system makes use both of presently collected data relating to the customer, and a database of historical data relating to the customer. Using this information, the system performs a customer preference analysis, to select one or more rewards to offer the customer (from among a set of predefined reward possibilities), which are better adapted to the customers' personal needs.

[0009] The proposed mechanism can surprise the customers, making them feel that attention has been paid to them. As a consequence, the rating for retailers may be increased and attract the customers to go back.

[0010] A method which is an embodiment of the proposed mechanism may be performed automatically (e.g. upon automatically recognising that a certain customer arrives at a geographical location associate with at least one retailer, e.g. shopping center; a surveillance system may be provided at the geographical location to do this), without an additional requirement of asking the customers to disclose their personal information, and this improves the convenience of the customers' shopping experience.

[0011] The presently collected data may include responses to questions put to the customer relating to his present shopping experience. Customer honesty is considered in the step of determining which rewards to offer the consumer, to encourage the consumers to express their feelings more clearly.
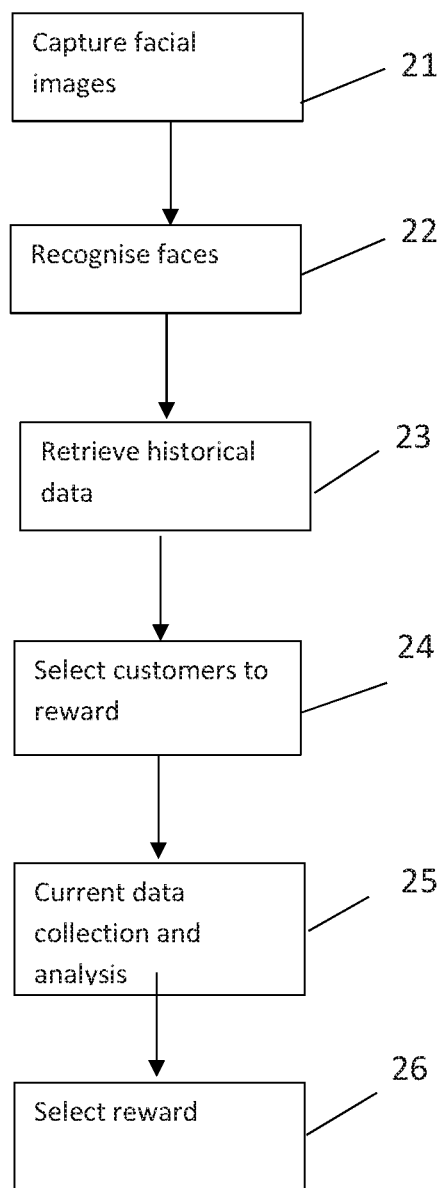
[0012] The benefits provided by preferred embodiments of the invention are bidirectional. The customers can be rewarded in a way which is appropriate to their personal preferences. Furthermore, since they are rewarded also for truthfully presenting their feelings and preferences, the retailers can improve their service through analyzing the truthfully presented feelings and preferences from the customers. At the same time, more customers can be attracted through customer referral [2].

[0013] The term "automatically" is used in this document to mean a process substantially without human involvement, except with regards to setting up a system to perform the automatic process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] A non-limited example of the invention will now be described for the sake of example only with reference to the following figures, in which:

[0015] FIG. 1 is a view of a system which is an embodiment of the method; and

[0016] FIG. 2 is a flow diagram of the method performed by the embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENT

[0017] FIG. 1 shows schematically a system which is an embodiment of the invention. FIG. 2 shows the steps of the method. The system employs one or more security cameras 1 which are positioned at entrances to a shopping center. When customers 2 enter the shopping center, images of their faces are captured (step 21), and the images are sent to a computational system 10 having a processor 3 which is able to access a database 4 containing a plurality of customer records, each relating to a respective previous customer. Each customer record contains both one or more previously captured images of the customer and historical data relating to that customer 2, e.g. shopping records and a user profile. Using the database, the processor 3 performs a facial recognition algorithm [3, 4] to try to identify the customers 2 among the previous customers (step 22), to associate one of the customer records with a customer 2 entering the shopping center.

[0018] If a customer 2 is not recognised in step 22, a new customer record is generated. One or more images of the customer 2 captured by the camera 2 are entered into the customer records. The historical data section of the customer record is populated as the customer shops in the shopping center.

[0019] Conversely, if a customer 2 is recognised in step 22, the historical data relating to that customer is extracted from the database (step 23); during the rest of the method below any new information which is generated relating to the customer is added to the historical data in the customer profile in the database 4.

[0020] In step 24, the historical data for the recognised customers 2 is used to select customers to reward.

[0021] In step 25, the system generates further data characterizing the current behaviour of the customers 2 (i.e. behaviour after the customer 2 has entered the geographical location). For example, the security cameras 1 may record where in the shopping center the customers 2 go. Furthermore, if the customers 2 make a purchase, the details of the purchase are collected. Additionally, the customer 2 may be asked questions regarding their shopping experience, and that data input to the processor 3 using the interface 5. Emotional information can be inferred from the customer's shopping experience. The reward amount may be partially determined by the customer's emotion. For example, when the customer is in a low emotion (i.e. a bad mood), a slightly higher reward can be provided to him.

[0022] In step 26, the data characterizing the current behaviour of the customers 2, and the historical data relating to those customers, is used to determine at least one reward to be offered to the customers 2 selected in step 24. These reward(s) may be selected from a predetermined database of rewards. Optionally, a plurality of rewards may be selected and offered, from which the user can select at least one. The rewards can be in a form such as personalized gifts or vouchers. For example, if a certain customer often buys cosmetics of a particular brand, then samples of the latest products from this brand can be provided to the customer as rewards. If the data characterizing the current behaviour of the customer shows that the customer has spent time in an area of the shopping center where certain goods are sold, e.g. an area of where children's clothes are displayed, then some vouchers to buy children's clothes can be provided to the customer as rewards. The techniques from the user prefer-

ence analysis in recommendation systems [5] [6] can be applied to make customers prefer the rewards.

[0023] The embodiment explained above can be applied in the environment of a real shopping center to provide the customers 2 with rewards matching their preferences.

[0024] A second embodiment of the invention is adapted instead for use in an e-commerce environment, in which customers operating respective computer systems communicate (e.g. over the internet) with an e-Commerce website. The method of this embodiment is that same as that of FIG. 2, except that steps 21 and 22 are replaced by a user login process. In this embodiment, step 25 may include collating information about which webpages in the online store the user views, and/or which search terms he or she uses. It may further include asking the consumer questions about his or her shopping experience.

[0025] Both forms of the embodiment make it possible to provide rewards which depend upon customer preferences. By providing such kind of rewards, the customers will feel surprised and be encouraged to go back more often. Hence, such rewards will provide customers with a more convenient and enjoyable shopping experience, as well as benefit the product providers by helping them to sell more products.

REFERENCES

[0026] The disclosure of the following references is incorporated herein in its entirety.

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[0029] [3] Pengcheng Wu, Steven C. H. Hoi, Hao Xia, Peilin Zhao, Dayong Wang, Chunyan Miao, "Online Multimodal Deep Similarity Learning with Application to Image Retrieval", in Proceedings of the 21st ACM international conference on Multimedia, pp. 153-162, 2013.

[0030] [4] Jialei Wang, Peilin Zhao, Steven C. H. Hoi, and Rong Jin, "Online Feature Selection and Its Applications", IEEE Transactions on Knowledge and Data Engineering (TKDE), 2013.

[0031] [5] Y. Koren. "Collaborative recommendation". In Proceedings KDD'09, pp. 195-202, 2009.

[0032] [6] Y. Koren, R. Bell, and C. Volinsky. Matrix factorization techniques for recommender system. Computer, 42(8):30-37, 2009.

[0033] [7] WO 2011/146054, "Improved customer reward systems and methods".

1. A computer system comprising:
   a computer processor; and
   a data storage device, the data storage device storing:
   for each of a plurality of customers a profile comprising historic data indicating a history of interaction with at least one retailer, and
   program instructions operative to cause the processor:
   to recognise that a said customer is interacting with the at least one retailer;
      to extract from the database the historic data for the recognised customer;
      to receive current data describing the present behaviour of the recognised customer; and
   to use the historic data and the current data to select, from among a predefined plurality of rewards, a reward to be presented to the recognised customer.

2. A system according to claim **1**, further comprising one or more cameras arranged to capture an image of a said customer if the said customer is in a geographical location associated with the at least one retailer,

the profile further storing at least one stored image of each of the customers,

the program instructions causing the processor to recognise that the customer is interacting with the at least one retailer by performing an image recognition process on an image captured by the one of more cameras using the stored images.

3. A system according to claim **1**, further comprising an interface, the program instructions being operative to cause the processor to register said current data comprising data entered via the interface, to indicate the answers given by the said customer to questions.

4. A method for rewarding a customer of at least one retailer, the method comprising:

(a) to recognise that a said customer is interacting with the at least one retailer;

(b) to access a database which stores, for each of a plurality of customers a profile comprising historic data indicating a history of interaction of the recognised customer with the at least one retailer,

(c) to extract from the database the historic data for the recognised customer;

(d) to receive current data from the customer comprising data describing the present behaviour of the recognised customer;

(e) to use the historic data and the current data to select, from among a predefined plurality of rewards, a reward to be presented to the customer; and

(f) to provide the selected reward to the recognised customer.

5. A method according to claim **4**, further comprising capturing an image of the customers using one or more cameras arranged to capture an image of a said customer if the said customer is in a geographical location associated with the at least one retailer,

the profile further comprising at least one stored image of each of the customers,

step (a) being performed by performing an image recognition process on an image captured by the one of more cameras using the stored images.

6. A method according to claim **4** further comprising a step of using the historic data for the customer to determine whether or not to provide a reward to a recognised customer.

7. A method according to claim **4** wherein the current data comprises data indicating a region of the geographical location associated with a type of product, step (e) being performed to select a reward which is a product of said type.

8. A method according to claim **4** wherein the current data comprises data describing the recognised customer's current feelings in using the at least one retailer.

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