DESCRIPTION

Title of Invention

CUSTOMER SERVICE PROPOSAL DEVICE

Technical Field

[0001]

The present invention relates to a technique of proposing a customer service method when selling a product.

Background Art

[0002]

In a scene of product (including service) sales, an object originally supposed to be sold cannot be sold, or conversely, an object supposed to be difficult to sell is easily sold, depending on skill of a customer service method.

[0003]

In addition, Patent Literature 1 proposes a system that supports a store clerk to provide an appropriate customer service or a comfortable shopping environment by presenting a customer service method according to a store visitor and setting a notification destination according to a work content of the store clerk.

Citation List

Patent Literature

[0004]

Patent Literature 1: JP 2016-153935 A

Summary of Invention

Technical Problem

[0005]

However, the above-described conventional technique has a problem that when a business operator sells a product desired to be sold to a consumer, it is not possible to obtain a specific measure to increase contract probability related to the sale of the product.

[0006]

Therefore, in view of the above problem, an object of the present invention is to provide a customer service proposal device capable of accurately obtaining a specific customer service method suitable for a product desired to be sold with reference to a purchased product in a purchase history and efficiently promoting expansion of sales.

Solution to Problem

[0007]

An aspect of a customer service proposal device to be disclosed includes: a model generation means that causes a machine learning model to learn a data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and generates the machine learning model that outputs the specific customer service method by receiving an input of a product to be

sold and the purchase history; a model storage means that stores a parameter defining an input/output characteristic of the machine learning model that outputs the specific customer service method in response to the input of the product to be sold and the purchase history; a customer service method generation means that inputs a data set of the product to be sold and the purchase history to the machine learning model to generate the specific customer service method; a customer service implementation means that performs processing of causing the specific customer service method to be implemented at a sales site; a verification information calculation means that calculates a sales amount related to a product for which the specific customer service method has been performed; a goal achievement determination means that determines whether or not the sales amount falls below a predetermined target value; an additional learning means that causes the machine learning model to perform additional learning; and a customer service method regeneration means that inputs the data set of the product to be sold and the purchase history to the machine learning model after the additional learning to regenerate the another specific customer service method in a case where the goal achievement determination means determines that the sales amount falls below the predetermined target value.

[0008]

Further, another aspect of a customer service proposal device to be disclosed includes: a model generation means that causes a machine learning model to learn a data set of a successfully sold

product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and generates the machine learning model that outputs the specific customer service method by receiving an input of a product to be sold and the purchase history; a model storage means that stores a parameter defining an input/output characteristic of the machine learning model that outputs the specific customer service method in response to the input of the product to be sold and the purchase history; a customer service method generation means that inputs a data set of the product to be sold and the purchase history to the machine learning model to generate the specific customer service method; a customer service implementation means that performs processing of causing the specific customer service method to be implemented at a sales site; a verification information calculation means that calculates a sales number related to a product for which the specific customer service method has been performed; a goal achievement determination means that determines whether or not the sales number falls below a predetermined target value; an additional learning means that causes the machine learning model to perform additional learning; and a customer service method regeneration means that inputs the data set of the product to be sold and the purchase history to the machine learning model after the additional learning to regenerate the another specific customer service method in a case where the goal achievement determination means determines that the sales number falls below the predetermined target value.

Advantageous Effects of Invention

[0009]

The customer service proposal device to be disclosed is capable of accurately obtaining a specific customer service method suitable for a product desired to be sold with reference to a purchased product in a purchase history and efficiently promoting expansion of sales.

Brief Description of Drawings

[0010]

Fig. 1 is a diagram illustrating an outline of a customer service proposal device according to the present embodiment.

Fig. 2 is a functional block diagram of the customer service proposal device according to the present embodiment.

Fig. 3 is a diagram illustrating an example of a learning data set according to the present embodiment.

Fig. 4 is a diagram illustrating a hardware configuration example of the customer service proposal device according to the present embodiment.

Fig. 5 is a flowchart illustrating a flow of a processing example by the customer service proposal device according to the present embodiment.

Description of Embodiments

[0011]

An embodiment for implementing the present invention will be described with reference to the drawings.

(Operation principle of customer service proposal device according to present embodiment)

[0012]

An operation principle of a customer service proposal device (hereinafter simply referred to as the "present device") 100 according to the present embodiment will be described with reference to Figs. 1 and 2. Fig. 1 is a diagram illustrating a connection relationship between the present device 100 and another device, and Fig. 2 is a functional block diagram of the present device 100.

[0013]

As illustrated in Fig. 1, the present device 100 is connected to a store terminal 290 via a communication network 300. The communication network 300 may be in either a wired form or a wireless form. The store terminal 290 is a device that notifies the present device 100 of a sales status and an inventory status of products sold in a store (including a virtual store), and may be, for example, a point of sales (POS) system.

[0014]

As illustrated in Fig. 2, the present device 100 includes a learning data storage means 110, a model storage means 120, a model generation means 130, a customer service method generation means 140, a customer service implementation means 150, a verification information calculation means 160, a goal achievement determination

means 170, an additional learning means 180, and a customer service method regeneration means 190. Note that the storage means 110 and 120 are not necessarily provided in the present device 100, and the present device 100 may use the storage means 110 and 120 provided in an external device.

[0015]

The learning data storage means 110 stores a learning data set 240 of a successfully sold product 210, (a purchased product in) a purchase history 220 before sale of the product 210, and a specific customer service method 230 when the product 210 has been sold. The learning data set 240 is added and updated with the lapse of time. The specific customer service method 230 includes sales talk to a customer, an advertisement to be displayed on a display (digital signage), a coupon, and the like, and may be a combination thereof.

[0016]

Fig. 3 illustrates an example of the learning data storage means 110. As illustrated in Fig. 3, the learning data storage means 110 stores, for example, the product 210: instant miso soup, the purchase history 220: a group of products effective for liver, the customer service method 230: effective for hangover! in association with one another. In addition, the learning data storage means 110 stores, for example, the product 210: cosmetics, the purchase history 220: none, the customer service method 230: even famous actresses continue to use it! in association with one another. Note that the information stored in the learning data

storage means 110 is not limited thereto.

The model storage means 120 stores a parameter that defines input/output characteristics of a machine learning model 280 to be described below.

[0017]

The model generation means 130 causes the machine learning model 280 to perform machine learning for the learning data set 240, and generates the machine learning model 280 that receives an input of a product 250 to be sold and the purchase history 260 of the target customer to output a specific customer service method 270. Note that a learning algorithm is not particularly limited.

[0018]

The customer service method generation means 140 inputs a data set of the product 250 desired to be sold and the purchase history 260 of the target customer to the machine learning model 280 to generate the specific customer service method 270. The specific customer service method 270 includes sales talk to a customer, an advertisement to be displayed on a display (digital signage), a coupon, and the like, and may be a combination thereof.

[0019]

The customer service implementation means 150 performs processing of causing the specific customer service method 270 to be implemented at a sales site of the product 250 to be sold. For example, the customer service implementation means 150 causes a specific customer service method 270 to be displayed on an employee terminal or the specific customer service method 270 to be

displayed on an in-store display.

[0020]

The verification information calculation means 160 calculates a sales amount or a sales number related to the product 250 to be sold. The verification information calculation means 160 acquires, from the store terminal 290, information of the sales amount or the sales number of the products 250 to be sold, and performs work of adding up the information.

[0021]

The goal achievement determination means 170 determines whether or not the sales amount or the sales number related to the product 250 calculated by the verification information calculation means 160 falls below a predetermined target value. The target value can be appropriately set.

[0022]

The additional learning means 180 causes the machine learning model 280 to perform additional learning using the added/updated learning data set 240. Note that the input/output characteristics of the machine learning model 280 generally change before and after additional learning is performed. Furthermore, when the processing by the additional learning means 180 is performed, the information stored in the model storage means 120 is also updated.

[0023]

In a case where “falls below” is determined by the goal achievement determination means 170, the customer service method regeneration means 190 inputs the data set of the product 250 to be

sold and the purchase history 260 of the target customer to the machine learning model 280 after the additional learning to regenerate another specific customer service method 270.

[0024]

The present device 100 can accurately obtain the specific customer service method 270 suitable for the product 250 desired to be sold with reference to the purchased product 260 in the purchase history and efficiently promote expansion of the sales amount on the basis of the above operation principle.

(Hardware configuration of customer service proposal device according to present embodiment)

[0025]

A hardware configuration example of the present device 100 will be described with reference to Fig. 4. Fig. 4 is a diagram illustrating an example of a hardware configuration of the present device 100. As illustrated in Fig. 4, the present device 100 includes a central processing unit (CPU) 510, a read-only memory (ROM) 520, a random access memory (RAM) 530, an auxiliary storage device 540, a communication I/F 550, an input device 560, a display device 570, and a storage medium I/F 580.

[0026]

The CPU 510 is a device that executes a program stored in the ROM 520, and performs arithmetic processing for data deployed (loaded) in the RAM 530 according to an instruction of the program to control the entire present device 100. The ROM 520 stores the program executed by the CPU 510 and data. When the CPU 510 executes

the program stored in the ROM 520, the RAM 530 deploys (loads) the program to be executed and data, and temporarily holds operation data during operation.

[0027]

The auxiliary storage device 540 is a device that stores an operating system (OS) that is basic software, an application program according to the present embodiment, and the like together with related data, and may include, for example, the learning data storage means 110 and the model storage means 120. The auxiliary storage device 540 is, for example, a hard disk drive (HDD), a flash memory, or the like.

[0028]

The communication I/F 550 is an interface that is connected to the communication network 300 such as a wired or wireless local area network (LAN) or the Internet and exchanges data with another device (POS system or the like) 290 that provides a communication function.

[0029]

The input device 560 is a device such as a keyboard for inputting data to the present device 100. The display device (output device) 570 is a device including a liquid crystal display (LCD) or the like, and functions as a user interface when a user uses the functions of the present device 100 or performs various settings. The storage medium I/F 580 is an interface for transmitting and receiving data to and from a storage medium 590 such as a CD-ROM, a DVD-ROM, or a USB memory.

[0030]

Each means included in the present device 100 may be realized by the CPU 510 executing a program corresponding to each means stored in the ROM 520 or the auxiliary storage device 540. In addition, the processing related to each means included in the present device 100 may be realized as hardware. In addition, it may be configured to read the program according to the present invention from an external server device via the communication I/F 550, or to read the program according to the present invention from the storage medium 590 via the storage medium I/F 580, and to cause the present device 100 to execute the program.

(Processing example by customer service proposal device according to present embodiment)

A processing example by the present device 100 will be described with reference to Fig. 5. Fig. 5 is a flowchart illustrating a flow of the processing example by the present device 100.

[0031]

In S10, the model generation means 130 causes the machine learning model 280 to perform machine learning for the learning data set 240, and generates the machine learning model 280 that receives an input of the product 250 desired to be sold and (the purchased product in) the purchase history 260 of the target customer to output the specific customer service method 270. Note that the learning algorithm of the machine learning model 280 is not particularly limited.

In addition, the parameter that defines the input/output characteristics of the machine learning model 280 generated by the processing in S10 is stored in the model storage means 120.

[0032]

In S20, the customer service method generation means 140 inputs a data set of the product 250 desired to be sold and the purchase history 260 of the target customer to the machine learning model 280 to generate the specific customer service method 270. The specific customer service method 270 includes sales talk to a customer, an advertisement to be displayed on a display (digital signage), a coupon, and the like, and may be a combination thereof.

[0033]

Then, in S20, the customer service implementation means 150 performs processing of causing the specific customer service method 270 to be implemented at the sales site. For example, the customer service implementation means 150 causes the specific customer service method 270 to be displayed on an employee terminal or the specific customer service method 270 to be displayed on an in-store display.

[0034]

Further, after the processing of S20, the additional learning means 180 performs processing of causing the machine learning model 280 to perform the additional learning using the added/updated learning data set 240. Note that the input/output characteristics of the machine learning model 280 generally change before and after additional learning is performed. Furthermore, when the processing

by the additional learning means 180 is performed, the information stored in the model storage means 120 is also updated.

[0035]

In S30, the verification information calculation means 160 calculates a sales amount or a sales number related to the product 250 to be sold. The verification information calculation means 160 acquires, from the store terminal 290, information of the sales amount or the sales number of the products 250 to be sold, and performs work of adding up the information.

[0036]

Then, in S30, the goal achievement determination means 170 determines whether or not the sales amount or the sales number related to the product 250 calculated in S30 falls below the predetermined target value. The target value can be appropriately set.

[0037]

In a case where "falls below" is determined in S30, the customer service method regeneration means 190 inputs the data set of the product 250 to be sold and the purchase history 260 of the target customer to the machine learning model 280 after the additional learning to regenerate another specific customer service method 270 in S40.

[0038]

By performing the processing as described above, the present device 100 can accurately obtain the specific customer service method 270 suitable for the product 250 desired to be sold with

reference to the purchased product 260 in the purchase history and efficiently promote expansion of the sales.

[0039]

Although the embodiments of the present invention have been described in detail above, the present invention is not limited to the specific embodiments, and various modifications and changes can be made within the scope of the gist of the present invention described in the claims.

Reference Signs List

[0040]

100 Customer service proposal device

110 Learning data storage means

120 Model storage means

130 Model generation means

140 Customer service method generation means

150 Customer service implementation means

160 Verification information calculation means

170 Goal achievement determination means

180 Additional learning means

190 Customer service method regeneration means

210 Successfully sold product

220 (Purchased product in) purchase history before sale of successfully sold product

230 Specific customer service method when product has been sold

240 Learning data set

250 Product to be sold

260 (Purchased product in) purchase history of target customer

270 Specific customer service method generated by machine learning model

280 Machine learning model

290 Store terminal (POS system)

300 Communication network

510 CPU

520 ROM

530 RAM

540 Auxiliary storage device

550 Communication interface

560 Input device

570 Output device

580 Storage medium interface

590 Storage medium

CLAIMS

[Claim 1]

A customer service proposal device comprising:

a model generation means that causes a machine learning model to learn a data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and generates the machine learning model that outputs the specific customer service method by receiving an input of a product to be sold and the purchase history;

a model storage means that stores a parameter defining an input/output characteristic of the machine learning model that outputs the specific customer service method in response to the input of the product to be sold and the purchase history;

a customer service method generation means that inputs a data set of the product to be sold and the purchase history to the machine learning model to generate the specific customer service method;

a customer service implementation means that performs processing of causing the specific customer service method to be implemented at a sales site;

a verification information calculation means that calculates a sales amount related to a product for which the specific customer service method has been performed;

a goal achievement determination means that determines whether or not the sales amount falls below a predetermined target

value;

an additional learning means that causes the machine learning model to perform additional learning; and

a customer service method regeneration means that inputs the data set of the product to be sold and the purchase history to the machine learning model after the additional learning to regenerate the another specific customer service method in a case where the goal achievement determination means determines that the sales amount falls below the predetermined target value.

[Claim 2]

A customer service proposal device comprising:

a model generation means that causes a machine learning model to learn a data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and generates the machine learning model that outputs the specific customer service method by receiving an input of a product to be sold and the purchase history;

a model storage means that stores a parameter defining an input/output characteristic of the machine learning model that outputs the specific customer service method in response to the input of the product to be sold and the purchase history;

a customer service method generation means that inputs a data set of the product to be sold and the purchase history to the machine learning model to generate the specific customer service method;

a customer service implementation means that performs processing of causing the specific customer service method to be implemented at a sales site;

a verification information calculation means that calculates a sales number related to a product for which the specific customer service method has been performed;

a goal achievement determination means that determines whether or not the sales number falls below a predetermined target value;

an additional learning means that causes the machine learning model to perform additional learning; and

a customer service method regeneration means that inputs the data set of the product to be sold and the purchase history to the machine learning model after the additional learning to regenerate the another specific customer service method in a case where the goal achievement determination means determines that the sales number fall below the predetermined target value.

[Claim 3]

A customer service proposal method comprising:

in a computer provided with a model storage means that stores a parameter defining an input/output characteristic of a machine learning model that is caused to perform machine learning for a data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and outputs the specific customer service method by receiving an input of a product to be sold and

the purchase history,

a step in which a model generation means causes the machine learning model to learn the data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and generates the machine learning model that outputs the specific customer service method by receiving an input of the product to be sold and the purchase history;

a step in which a customer service method generation means inputs a data set of the product to be sold and the purchase history to the machine learning model to generate the specific customer service method;

a step in which a customer service implementation means performs processing of causing the specific customer service method to be implemented at a sales site;

a step in which a verification information calculation means calculates a sales amount related to a product for which the specific customer service method has been performed;

a step in which a goal achievement determination means determines whether or not the sales amount falls below a predetermined target value;

a step in which an additional learning means performs additional learning for the machine learning model; and

a step in which a customer service method regeneration means inputs the data set of the product to be sold and the purchase history to the machine learning model after the additional learning

to regenerate the another specific customer service method in a case where the goal achievement determination means determines that the sales amount falls below a predetermined target value.

[Claim 4]

A customer service proposal method comprising:

in a computer provided with a model storage means that stores a parameter defining an input/output characteristic of a machine learning model that is caused to perform machine learning for a data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and outputs the specific customer service method by receiving an input of a product to be sold and the purchase history,

a step in which a model generation means causes the machine learning model to learn the data set of a successfully sold product, a purchase history before sale of the product, and a specific customer service method when the product has been sold, and generates the machine learning model that outputs the specific customer service method by receiving an input of the product to be sold and the purchase history;

a step in which a customer service method generation means inputs a data set of the product to be sold and the purchase history to the machine learning model to generate the specific customer service method;

a step in which a customer service implementation means performs processing of causing the specific customer service method

to be implemented at a sales site;

a step in which a verification information calculation means calculates a sales number related to a product for which the specific customer service method has been performed;

a step in which a goal achievement determination means determines whether or not the sales number falls below a predetermined target value;

a step in which an additional learning means performs additional learning for the machine learning model; and

a step in which a customer service method regeneration means inputs the data set of the product to be sold and the purchase history to the machine learning model after the additional learning to regenerate the another specific customer service method in a case where the goal achievement determination means determines that the sales number falls below a predetermined target value.

[Claim 5]

A customer service proposal program causing a computer to execute the method according to claim 3 or 4.