

METHOD, APPARATUS, DEVICE AND STORAGE MEDIUM FOR PRESENTING RECOMMENDED OBJECT

[0001] The present application claims priority to Chinese Patent Application No. 202411755195.0, filed on December 02, 2024, and entitled "METHOD, APPARATUS, DEVICE AND STORAGE MEDIUM FOR PRESENTING RECOMMENDED OBJECT", which is hereby incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] Example embodiments of the present disclosure generally relate to the field of computers, and in particular, to a method, an apparatus, a device, and a computer-readable storage medium for presenting a recommended object.

BACKGROUND

[0003] With the rapid development of Internet technologies, various applications have become important tools in people's daily life. Different applications often have different functions, and users may implement specific services through specific applications with specific functions.

[0004] In order to integrate more functions and provide more content in an application, the application is usually associated with a plurality of pages to provide different content. In the case that the application is associated with the plurality of pages, the application may provide different areas to implement switching between the pages based on the different areas. For example, for a common phenomenon that a user makes purchases of the same product multiple times, the user needs to implement re-initiation of an order for a certain product based on a long link. Therefore, it is expected to be able to shorten the link for the user to re-initiate the order, improve interaction efficiency, and thereby improve user experience.

SUMMARY

[0005] In a first aspect of the present disclosure, a method for presenting a recommended object is provided. The method includes: presenting, in a first area of a target page, object information and an order entry control for each of at least one recommended object in response to detecting that the target page is presented, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set, where the first data set includes: historical behavior data related to a plurality of objects, the historical behavior data indicating that a predetermined type of interaction behavior is performed on the plurality of objects, and/or historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for objects in the set of objects; and switching from the target page to an object page corresponding to a target recommended object in the at least one recommended object in response to detecting that the order entry control for the target recommended object is triggered, where an entry to initiate an order request for the target recommended object is provided in the object page.

[0006] In a second aspect of the present disclosure, an apparatus for presenting a recommended object is provided. The apparatus includes: a query module configured to present, in a first area of a target page, object

information and an order entry control for each of at least one recommended object in response to detecting that the target page is presented, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set, where the first data set includes: historical behavior data related to a plurality of objects, the historical behavior data indicating that a predetermined type of interaction behavior is performed on the plurality of objects, and/or historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for objects in the set of objects; and an object page switching module configured to switch from the target page to an object page corresponding to a target recommended object in the at least one recommended object in response to detecting that the order entry control for the target recommended object is triggered, where an entry to initiate an order request for the target recommended object is provided in the object page.

[0007] In a third aspect of the present disclosure, an electronic device is provided. The device includes at least one processor; and at least one memory, the at least one memory being coupled to the at least one processor and storing instructions executable by the at least one processor, the instructions, when executed by the at least one processor, causing the device to perform the method of the first aspect.

[0008] In a fourth aspect of the present disclosure, a computer-readable storage medium is provided. The computer-readable storage medium has stored thereon computer-executable instructions executable by a processor to implement the method of the first aspect.

[0009] In a fifth aspect of the present disclosure, a computer program product is provided. The computer program product is tangibly stored in a computer storage medium and includes computer-executable instructions, the computer-executable instructions, when executed by a device, causing the device to perform the method of the first aspect.

[0010] It would be appreciated that the content described in the Summary section of the present disclosure is neither intended to identify key or essential features of the embodiments of the present disclosure, nor is it intended to limit the scope of the present disclosure. Other features of the present disclosure will be readily envisaged through the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The above and other features, advantages and aspects of the embodiments of the present disclosure will become more apparent in combination with the drawings and with reference to the following detailed description. In the drawings, the same or similar reference symbols refer to the same or similar elements, where:

[0012] Fig. 1 shows a schematic diagram of an example environment in which the embodiments of the present disclosure may be implemented;

[0013] Figs. 2A to 2E show schematic diagrams of example interfaces for presenting a recommended object according to some embodiments of the present disclosure;

[0014] Fig. 3 shows a flowchart of a process for presenting a recommended object according to some embodiments of the present disclosure;

[0015] Fig. 4 shows a block diagram of an apparatus for presenting a recommended object according to some embodiments of the present disclosure; and

[0016] Fig. 5 shows a block diagram of an electronic device in which one or more embodiments of the present

disclosure may be implemented.

DETAILED DESCRIPTION OF EMBODIMENTS

[0017] It would be appreciated that before using the technical solutions disclosed in the embodiments of the present disclosure, the user shall be informed of the type, range of use, use scenarios, etc., of personal information involved in the present disclosure in an appropriate manner and the authorization of the user shall be obtained in accordance with relevant laws and regulations.

[0018] For example, in response to receiving an active request from a user, prompt information is sent to the user to clearly prompt the user that the requested operation will require access to and use of the user's personal information. As such, the user may independently choose, based on the prompt information, whether to provide the personal information to software or hardware, such as an electronic device, an application, a server, or a storage medium, that performs the operations of the technical solutions of the present disclosure.

[0019] As an optional but non-limiting implementation, in response to receiving the active request from the user, the prompt information may be sent to the user in the form of, for example, a pop-up window, in which the prompt information may be presented in text. Furthermore, the pop-up window may also include a selection control for the user to choose whether to "agree" or "disagree" to provide the personal information to the electronic device.

[0020] It would be appreciated that the above process of notifying and obtaining user authorization is only illustrative and does not limit the implementations of the present disclosure, and other manners that satisfy relevant laws and regulations may also be applied in the implementations of the present disclosure.

[0021] It would be appreciated that the data involved in the technical solution (including but not limited to the data itself, acquisition or use of the data) shall comply with requirements of corresponding laws, regulations, and related provisions.

[0022] The embodiments of the present disclosure will be described in more detail below with reference to the drawings. Although some embodiments of the present disclosure are shown in the drawings, it would be appreciated that the present disclosure may be implemented in various forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided for a thorough and complete understanding of the present disclosure. It would be appreciated that the drawings and embodiments of the present disclosure are only for illustrative purposes and are not intended to limit the scope of protection of the present disclosure.

[0023] It should be noted that the titles of any section/sub-section provided herein are not limiting. Various embodiments are described throughout this document, and any type of embodiment may be included under any section/sub-section. Furthermore, the embodiments described in any section/sub-section may be combined in any manner with any other embodiments described in the same section/sub-section and/or different section/sub-section.

[0024] As used herein, unless explicitly stated, performing a step "in response to A" does not mean that the step is performed immediately after "A", but may include one or more intermediate steps.

[0025] In the description of the embodiments of the present disclosure, the term "include/comprise" and similar terms thereto shall be construed as open-ended inclusions, that is, "include/comprise but not limited to". The

term "based on" shall be construed as "based at least in part on". The term "an embodiment" or "the embodiment" shall be construed as "at least one embodiment". The term "some embodiments" shall be construed as "at least some embodiments". Other definitions, either explicit or implicit, may be included below. The terms "first", "second", etc. may refer to different or same objects. Other definitions, either explicit or implicit, may be included below.

[0026] As used herein, the term "model" may learn the correlation between corresponding inputs and outputs from training data, so that a corresponding output may be generated for a given input after the training is completed. The generation of the model may be based on machine learning techniques. Deep learning is a machine learning algorithm that uses multiple layers of processing units to process inputs and provide corresponding outputs. As used herein, a "model" may also be referred to as a "machine learning model", a "machine learning network", or a "network", which terms are used interchangeably herein. A model may in turn include different types of processing units or networks.

[0027] As briefly mentioned above, in the scenario where a user makes purchases of the same product multiple times, the user may need to view a historical order list and search for a purchased product from the historical order list to re-initiate an order (i.e., make a repurchase). For example, the user may also enter order details, click a control for re-purchase, search for an order, and enter an e-commerce store that the user often makes purchases from to re-initiate the order. However, in this way, the link for the user to re-initiate the order is too long, and there is no recommendation strategy for personalized objects.

[0028] Embodiments of the present disclosure provide an improved solution for presenting a recommended object. According to various embodiments of the present disclosure, if a target page is detected to be presented, object information and an order entry control for each of at least one recommended object are presented in a first area of the target page, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set. The first data set used includes: historical behavior data for a plurality of objects, the historical behavior data indicating that a predetermined type of interaction behavior is performed on the plurality of objects, and/or historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for objects in the set of objects. If the order entry control for a target recommended object in the at least one recommended object is detected to be triggered, a switch is made from the target page to an object page corresponding to the target recommended object. An entry to initiate an order request for the target recommended object is provided in the provided object page. In this way, the user may conveniently initiate a new order for the object he/she is interested in from the object page. The embodiments of the present disclosure present a recommended object (e.g., a recommended product) that better fits the order initiating needs of the user in a specific area of a specific page. This may shorten the link for the user to search for the object for which the order needs to be re-initiated, significantly reduce interaction complexity, and enable the user to quickly locate and initiate an order for the object of interest. Such a solution may improve user experience.

EXAMPLE ENVIRONMENT

[0029] Fig. 1 shows a schematic diagram of an example environment 100 in which the embodiments of the present disclosure may be implemented. In this example environment 100, an application 120 is installed on a

terminal device 110. A user 140 may interact with the application 120 via the terminal device 110 and/or an attachment device of the terminal device 110.

[0030] In some embodiments, the application 120 may be a content sharing application, a content editing application, a content creation application, etc. The application 120 may provide the user 140 with various services related to media content (which may also be referred to as a media content item, a content item, a media item, etc.), including browsing, commenting, forwarding, creating (e.g., shooting and/or editing), publishing, etc., of the media content.

[0031] In the environment 100 of Fig. 1, if the application 120 is active, the terminal device 110 may present an interface 150 of the application 120. The interface 150 may include various interfaces that may be provided by the application 120, such as a media content presenting interface, a media content creating interface, a media content publishing interface, etc. The application 120 may provide a media content editing function (e.g., the application 120 may be an editing application) to support editing (e.g., clipping) of the media content in the application 120.

[0032] In some embodiments, the terminal device 110 communicates with a server 130 to implement the provision of the services of the application 120. The terminal device 110 may be any type of mobile terminal, fixed terminal, or portable terminal, including a mobile phone, a desktop computer, a laptop computer, a notebook computer, a netbook computer, a tablet computer, a media computer, a multimedia tablet, a personal communication system (PCS) device, a personal navigation device, a personal digital assistant (PDA), an audio/video player, a digital camera/video camera, a positioning device, a television receiver, a radio broadcast receiver, an e-book device, a gaming device, or any combination of the foregoing, including the accessories and peripherals of these devices, or any combination thereof. In some embodiments, the terminal device 110 may also support any type of user-specific interface (such as "wearable" circuitry, etc.). The server 130 may be various types of computing systems/servers that may provide computing power, including but not limited to mainframes, edge computing nodes, computing devices in cloud environments, etc.

[0033] It would be appreciated that the structure and function of the environment 100 are described for illustrative purposes only, without suggesting any limitation to the scope of the present disclosure.

[0034] Some example embodiments of the present disclosure will be described below with continued reference to the drawings. It would be appreciated that the pages shown in the drawings are only examples, and there may actually be various page designs. Each graphic element in a page may have different arrangements and different visual representations, one or more of the elements may be omitted or replaced, and there may also be one or more other elements. The embodiments of the present disclosure are not limited in this regard. Furthermore, in the following, the example embodiments will be described mainly with respect to the terminal device 110. It would be appreciated that the actions described with respect to the terminal device 110 may be performed by the application 120 on the terminal device 110, or may be performed by the application 120 in conjunction with its server side (e.g., the server 130). In some embodiments, in a scenario performed by the terminal device 130 in conjunction with its server side (e.g., a server), the terminal device 130 may request the server side to provide a recommended object to be presented, and receive the determined recommended object from the server side for presenting in a specified area of a target page.

[0035] A specific embodiment of the present disclosure for presenting a recommended object is described

below with reference to Figs. 2A to 2E. Figs. 2A to 2E show schematic diagrams of example interfaces 200A to 200E for presenting a recommended object according to some embodiments of the present disclosure.

[0036] In some embodiments, if the terminal device 110 detects that a target page is presented, it presents, in a first area of the target page, object information and an order entry control for each of at least one recommended object. In some embodiments, the at least one recommended object is determined to be selected from a set of objects for which the user has initiated a historical order based on a first data set. In some embodiments, the at least one recommended object comes from a set of objects that appear in the user's historical orders. In some embodiments, the target page includes a personal page of the user. In some examples, the first area may be presented anywhere on the target page, for example, on the right side, the left side, centered, etc., of the target page. In some examples, the terminal device 110 may carousel the at least one recommended object in the first area.

[0037] As shown in the example interface 200A of Fig. 2A, if the terminal device 110 detects that a personal page 200A of a user is presented, it may present, in an area 214 of the personal page 200A, object information and an order entry 217 for at least one object (e.g., a product) that the user 140 has previously purchased and may repurchase. The personal page 200A of the user 140 may include an area 211 for presenting information of the user 140, an area 212 for presenting tools, an area 213 for presenting order viewing, etc.

[0038] In some embodiments, the target page may also be a home page. As shown in the example interface 200B of Fig. 2B, if the terminal device 110 detects that a home page 200B is presented, it may present, in an area 223 of the home page 200B, object information and an order entry 225 for at least one object that the user 140 has previously purchased and may repurchase. For ease of discussion below, the description will mainly be made with respect to the case where the terminal device 110 presents the at least one recommended object in the personal page of the user, but this is only exemplary and the present disclosure is not limited thereto. The process of selecting the at least one recommended object will be described in detail below.

[0039] In some embodiments, the object information corresponding to the at least one recommended object includes attribute information of the corresponding object. In some examples, the attribute information of the object may include a picture corresponding to the object, a title corresponding to the object, price information corresponding to the object, etc. As shown in the example interface 200A of Fig. 2A, a picture 216 corresponding to the object, a title 218 corresponding to the object, and price information 219 corresponding to the object are presented in the area 214. In some embodiments, the object information corresponding to the at least one recommended object may further include information related to available virtual resources associated with the corresponding object. For example, virtual resources, such as a discount of XX yuan on an order, a discount of X yuan for every X yuan spent, and a voucher, that may be applied in a scenario of initiating an order.

[0040] In some examples, the terminal device 110 may further present, in the area 214, title information 215 indicating the function of this area, for example, "Items you have purchased". The terminal device 110 may further present prompt information in an area associated with the order entry control 217 included in the area 214. For example, corner mark information "Save X yuan immediately/Repurchased by over XX people" is presented in the upper right corner of the order entry control 217.

[0041] In the case that the at least one recommended object is presented, if the order entry control for a target recommended object in the at least one recommended object is detected to be triggered, the terminal device 110

switches from the target page to an object page corresponding to the target recommended object. The terminal device 110 provides, in the object page, an entry to initiate an order request for the target recommended object.

[0042] In some embodiments, the object page may include an order initiation page corresponding to the target recommended object. The order initiation page provides a direct order initiation control for the target recommended object.

[0043] As shown in the example interfaces 200A and 200E of Figs. 2A and 2E, if the terminal device 110 detects that the user 140 clicks on the order entry control 217 corresponding to a recommended object 210, it may switch from the page 200A to an order initiation page 200E corresponding to the recommended object 210. In some examples, the order initiation page presented by the terminal device 10 includes a direct order initiation control 252 for the recommended object 210. For example, the user 140 may click on the direct order initiation control 252 to purchase the recommended object 210.

[0044] In some embodiments, the first area further includes a detail entry related to the at least one recommended object. That is, if the terminal device 110 detects that the detail entry for the target recommended object is triggered, it switches from the target page to an object detail page for the target object. As shown in the example interfaces 200A and 200C of Figs. 2A and 2C, if the terminal device 110 detects that the user 140 clicks on an area other than the order entry control 217, it may switch from the page 200A to a detail page 200C of the recommended object 210. In some examples, the detail page 200C corresponding to the recommended object 210 may include an order initiation control price 231 for immediate ordering. The detail page 200C corresponding to the recommended object 210 may further include a control 232 for adding to a shopping cart.

[0045] In some embodiments, the object page may include a shopping cart page. If the terminal device 110 detects that the user 140 clicks on the order entry control 217 corresponding to the recommended object 210, it may switch from the page 200A to the shopping cart page of the user 140. Accordingly, the object information corresponding to the recommended object 210 is presented in the shopping cart page and is in a selected state. At this time, the terminal device 110 may present a "checkout" control included in the shopping cart page in a clickable state. That is, the user 140 may click on the "checkout" control to purchase the recommended object 210.

[0046] As shown in the example interfaces 200A and 200D of Figs. 2A and 2D, if the terminal device 110 detects that the user 140 clicks on the order entry control 217 corresponding to the recommended object 210, it may switch from the page 200A to a selection page 200E corresponding to the recommended object 210. In some examples, the selection page 200E presented by the terminal device 10 includes a selection panel 241 for providing an attribute option for the recommended object 210, and an order initiation control 242 for the recommended object 210. For example, in the scenario where the recommended object 210 has size information, if the terminal device 110 detects that the user 140 clicks on the order entry control 217, it may present the selection panel 241 for size selection. Subsequently, the user 140 may click on the order initiation control 242 to purchase the recommended object 210 with the size information.

[0047] The process of the recommended object presented in the target page being selected by the user is described below with continued reference to Fig. 1 and Figs. 2A to 2E.

[0048] In some embodiments, the first data set for determining the at least one recommended object to be presented from the set of objects includes historical behavior data for the plurality of objects, and/or historical

order data of the target user group. In some embodiments, the terminal device 110 may send a request to present the at least one recommended object or a request to present the target page to the server 130. The server 130 may determine to determine a recommended object for presentation from an associated user's historical order set in the case where it detects that the target page is to be presented to the user. The server 130 may use an algorithm to select at least one recommended object from the set of objects from the user's historical orders based on the current user's historical behavior data for the plurality of objects, and/or the historical order data of the target user group. Accordingly, the server 130 sends the at least one recommended object to the terminal device 110.

[0049] In some examples, the server 130 may further select a plurality of recommended objects from the set of objects for which a historical order has been initiated based on the user's historical behavior data for the plurality of objects, and/or the historical order data of the target user group. Considering that data analysis will take a certain amount of time, a plurality of recommended objects may be selected from the set of objects based on relevant data each time for subsequent display for multiple times. The server 130 sends at least one of the plurality of recommended objects to the terminal device 110. In some embodiments, if it is detected that the user 140 enters the target page again and/or refreshes the page, the recommended object presented to the user may be refreshed. For example, if the terminal device 110 detects that the target page is switched to again and/or the target page is refreshed, it may send a refresh request to the server 130. The server 130 may send at least one other recommended object of the plurality of recommended objects to the terminal device 110. The terminal device 110 presents object information and an order entry control for each of the at least one other recommended object.

[0050] It would be appreciated that the determination of the recommended object may also be performed locally on the terminal device 110, and the embodiments of the present disclosure are not limited thereto. For ease of discussion, how to determine the recommended object presented in the first area from the set of objects of historical orders will be discussed in detail below mainly from the perspective of the terminal device 110.

[0051] In some embodiments, the user's historical behavior data for the plurality of objects indicates that the user performs a predetermined type of interaction behavior on the plurality of objects. The historical behavior data may include data obtained over a period of time in the past. In some embodiments, the historical behavior data may indicate a plurality of objects that have recently been browsed and added to a shopping cart by the user 140. For another example, the historical behavior data may indicate a plurality of objects for which the user has recently initiated an order but has not paid, and a plurality of objects that have appeared in live streaming/video that the user has recently watched.

[0052] In some embodiments, the historical order data indicates a condition of the target user group initiating orders for the objects in the set of objects. In some examples, the historical order data may indicate a period and/or frequency at which all users using the application 120 (e.g., a shopping application) initiate orders for the objects in the set of objects. The historical order data may further indicate a period and/or frequency at which a plurality of users similar to the user 140 initiate orders for the objects in the set of objects.

[0053] In some embodiments, the terminal device 110 determines a first recommendation score corresponding to each object in the set of objects based on the historical behavior data. The first recommendation score indicates a probability of the user re-initiating an order for the object. In some embodiments, the terminal device 110 determines a respective predicted score corresponding to each of the plurality of objects based on the historical

behavior data, each predicted score indicating a purchase probability of the user for the corresponding object. Subsequently, the terminal device 110 determines at least one candidate object for the user from the plurality of objects based on the respective predicted score corresponding to each of the plurality of objects. Then, the terminal device 110 determines the first recommendation score corresponding to each object in the set of objects based on a similarity between each object in the set of objects and the at least one candidate object.

[0054] In some examples, the terminal device 110 determines, based on a plurality of objects that have recently been browsed, added to a shopping cart, initiated an order but not paid, and appeared in live streaming/video watched, by the user 140, a probability that the user 140 will purchase each of the plurality of objects in the near future. Accordingly, the terminal device 110 determines, from the plurality of objects, at least one candidate object that the user 140 has a high probability of purchasing based on the estimated probability of each object being purchased.

[0055] In some examples, if the terminal device 110 determines that an object A in the user's historical orders has a high similarity with some objects that the user 140 has a high probability of purchasing, it may determine that the user has a high probability of re-initiation an order for the object A. For example, if the terminal device 110 determines that an object X in the at least one candidate object exists in the user's historical orders, it may determine the object X as a recommended object.

[0056] Accordingly, the terminal device 110 determines a second recommendation score corresponding to each object in the set of objects based on the historical order data. The second recommendation score indicates a probability of the target user group re-initiating an order for the object. In some embodiments, the terminal device 110 determines an estimated order initiation period and/or an estimated order initiation frequency of each object in the set of objects based on the historical order data. Then, the terminal device 110 determines the second recommendation score corresponding to each object in the set of objects based on the estimated order initiation period and/or the estimated order initiation frequency of each object in the set of objects.

[0057] In some examples, the terminal device 110 may determine an estimated order initiation period and/or an estimated order initiation frequency corresponding to each object in the user's historical orders based on a period and/or frequency at which orders for the objects in the user's historical orders are initiated by all users using the application 120. For example, assuming that there is an object B in the user's historical orders, the terminal device 110 may determine an estimated order initiation period of the object B based on a purchase period of the object B (e.g., purchasing the object B once a week, a month, a year, etc.) by all users. The terminal device 110 may determine an estimated order initiation frequency of the object B based on the purchase frequency of the object B by all users. In some other examples, the terminal device 110 may further determine the estimated order initiation period and/or the estimated order initiation frequency corresponding to each object in the user's historical orders based on a period and/or frequency at which orders for the objects in the user's historical orders are initiated by a plurality of users similar to the user 140.

[0058] Then, the terminal device 110 determines, based on the estimated order initiation period and/or the estimated order initiation frequency of each object in the historical orders corresponding to the user 140 by all users on the platform and/or the plurality of users similar to the user 140, a probability of these users re-initiating an order for each object. It would be appreciated that the higher the frequency and the closer the period of these users considered in the target user group re-initiate an order for some objects, the higher the recommendation

score corresponding to these objects, and thus these objects are more likely to be recommended to the user 140.

[0059] In some embodiments, the terminal device 110 selects the at least one recommended object from the set of objects based on the first recommendation score and the second recommendation score corresponding to each object in the set of objects. In some embodiments, corresponding weights may be configured for the user's historical behavior data and the user group's historical order data, respectively. The terminal device 110 may use the corresponding weights to perform a weighted summation on the determined first recommendation score and the determined second recommendation score to obtain a recommendation score for each object in the set of objects. The terminal device 110 may select a recommended object to be used for presentation based on the recommendation score of each object. In this way, the terminal device 110 determines the at least one recommended object from each object based on the probability of the user 140 re-initiating an order for each object and the probability of the target user group re-initiating an order for each object. For example, if the user 140 has a strong interest/behavioral expression for an object XX, and the target user group has a high order initiation frequency and a close order initiation period for the object XX, the terminal device 110 may determine the object XX as a recommended object.

[0060] In some embodiments, in addition to considering the user's behavior data and the user group's historical order data, the terminal device 110 may further select the at least one recommended object from the set of objects based on historical order data of each object in the set of objects. In some embodiments, the terminal device 110 may select the at least one recommended object from the set of objects based on the number of historical orders corresponding to each object in the set of objects. In some examples, an object in the set of objects with a higher number of historical orders has a higher corresponding recommendation score, and thus may be determined as a recommended object.

[0061] In some embodiments, the terminal device 110 may select the at least one recommended object from the set of objects based on an initiation frequency corresponding to each object in the set of objects. In some examples, an object in the set of objects that has been purchased a higher number of times within a unit time (per week, per month) has a higher corresponding recommendation score, and thus may be determined as a recommended object.

[0062] In some embodiments, the terminal device 110 may select the at least one recommended object from the set of objects based on a time at which a historical order corresponding to each object in the set of objects is initiated. In some examples, an object that has been purchased more recently in the set of objects has a higher corresponding recommendation score, and thus may be determined as a recommended object. Therefore, consideration of an object that has been frequently purchased a long time ago may be avoided. For example, a user initially often purchases junior high school materials, but recently starts to purchase senior high school materials. In this case, the terminal device 110 may recommend senior high school materials to the user based on recent historical orders.

[0063] In some embodiments, the terminal device 110 may further receive a plurality of recommended objects to be presented in the first area. Then, the terminal device 110 selects the at least one recommended object different from an object presented in a second area from the plurality of recommended objects. As shown in the example interface 200A in Fig. 2A, the terminal device 110 performs deduplication on the plurality of recommended objects presented in the area 214 and the objects in the area (e.g., a module "Guess what you like")

220. In some examples, if the terminal device 110 determines that a certain recommended object in the plurality of recommended objects in the area 214 is duplicated with an object in the area 220, it does not present this recommended object in the area 214.

[0064] In summary, by displaying an additional first area on a target interface, the present disclosure is able to present a recommended object for personalized recommendation made for a purchased object, thereby shortening a link for a user to re-initiate an order. Furthermore, by using a recommendation algorithm in combination with user's purchasing habits and object characteristics, the recommended object may be accurately provided to the user, thereby improving conversion rate.

EXAMPLE PROCESS

[0065] Fig. 3 shows a flowchart of a process 300 of presenting a recommended object according to some embodiments of the present disclosure. The process 300 may be implemented at the terminal device 110. The process 300 will be described below with reference to Fig. 1.

[0066] At block 310, the terminal device 110 presents, in a first area of the target page, object information and an order entry control for each of at least one recommended object in response to detecting that a target page is presented, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set, where the first data set includes: historical behavior data related to a plurality of objects, the historical behavior data indicating that a predetermined type of interaction behavior is performed on the plurality of objects, and/or historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for the objects in the set of objects.

[0067] At block 320, the terminal device 110 switches from the target page to an object page corresponding to a target recommended object in the at least one recommended object in response to detecting that the order entry control for the target recommended object is triggered, where an entry to initiate an order request for the target recommended object is provided in the object page.

[0068] In some embodiments, the process 300 further includes determining the at least one recommended object by: determining a first recommendation score corresponding to each object in the set of objects based on the historical behavior data, the first recommendation score indicating a probability of the user re-initiating an order for the corresponding object; determining a second recommendation score corresponding to each object in the set of objects based on the historical order data, the second recommendation score indicating a probability of the target user group re-initiating an order for the object; and selecting the at least one recommended object from the set of objects based on the first recommendation score and the second recommendation score corresponding to each object in the set of objects.

[0069] In some embodiments, determining the first recommendation score corresponding to each object in the set of objects based on the historical behavior data includes: determining a predicted score corresponding to each of the plurality of objects based on the historical behavior data, each predicted score indicating a purchase probability of the user for the corresponding object; determining at least one candidate object for the user from the plurality of objects based on the predicted score corresponding to each of the plurality of objects; and determining a first recommendation score corresponding to each object in the set of objects based on a similarity

between each object in the set of objects and the at least one candidate object.

[0070] In some embodiments, determining the second recommendation score corresponding to each object in the set of objects based on the historical order data includes: determining an estimated order initiation period and/or an estimated order initiation frequency of each object in the set of objects based on the historical order data; and determining the second recommendation score corresponding to each object in the set of objects based on the estimated order initiation period and/or the estimated order initiation frequency of each object in the set of objects.

[0071] In some embodiments, the at least one recommended object is further selected from the set of objects based on historical order data of each object in the set of objects, the historical order data indicating a number of historical orders, an initiation frequency, and/or a time at which a historical order is initiated, corresponding to each object.

[0072] In some embodiments, the object information corresponding to the at least one recommended object includes at least one of: attribute information of a corresponding object, or information related to available virtual resources associated with the corresponding object.

[0073] In some embodiments, the target page includes a home page or a personal page of the user, and/or the object page includes an order initiation page corresponding to the target recommended object, the order initiation page providing a direct order initiation control for the target recommended object.

[0074] In some embodiments, the first area includes a detail entry associated with the at least one recommended object, and the process 300 further includes switching from the target page to an object detail page of the target object in response to detecting a trigger of the detail entry for the target recommended object.

[0075] In some embodiments, the process 300 further includes determining the at least one recommended object by: receiving a plurality of recommended objects to be presented in the first area; and selecting, from the plurality of recommended objects, the at least one recommended object different from an object presented in a second area.

EXAMPLE APPARATUS AND DEVICE

[0076] Fig. 4 shows a schematic structural block diagram of an apparatus 400 for presenting a recommended object according to some embodiments of the present disclosure. The apparatus 400 may be implemented as or included in the terminal device 110. Each module/component in the apparatus 400 may be implemented by hardware, software, firmware, or any combination thereof.

[0077] As shown in the figure, the apparatus 400 includes a query module 410 configured to present, in a first area of a target page, object information and an order entry control for each of at least one recommended object in response to detecting that the target page is presented, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set, where the first data set includes: historical behavior data of the user for a plurality of objects, the historical behavior data indicating that the user performs a predetermined type of interaction behavior on the plurality of objects, and/or historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for the objects in the set of objects. The apparatus 400 further includes an object page switching module 420 configured to switch from the target page to an object page corresponding to a target

recommended object in the at least one recommended object in response to detecting that the order entry control for the target recommended object is triggered, where an entry to initiate an order request for the target recommended object is provided in the object page.

[0078] In some embodiments, the apparatus 400 further includes a recommended object determination module configured to determine a first recommendation score corresponding to each object in the set of objects based on the historical behavior data, the first recommendation score indicating a probability of the user re-initiating an order for the corresponding object; determine a second recommendation score corresponding to each object in the set of objects based on the historical order data, the second recommendation score indicating a probability of the target user group re-initiating an order for the object; and select the at least one recommended object from the set of objects based on the first recommendation score and the second recommendation score corresponding to each object in the set of objects.

[0079] In some embodiments, the recommended object determination module is further configured to determine a predicted score corresponding to each of the plurality of objects based on the historical behavior data, each predicted score indicating a purchase probability of the user for the corresponding object; determine at least one candidate object for the user from the plurality of objects based on the predicted score corresponding to each of the plurality of objects; and determine a first recommendation score corresponding to each object in the set of objects based on a similarity between each object in the set of objects and the at least one candidate object.

[0080] In some embodiments, the recommended object determination module is further configured to determine an estimated order initiation period and/or an estimated order initiation frequency of each object in the set of objects based on the historical order data; and determine the second recommendation score corresponding to each object in the set of objects based on the estimated order initiation period and/or the estimated order initiation frequency of each object in the set of objects.

[0081] In some embodiments, the at least one recommended object is further selected from the set of objects based on historical order data of each object in the set of objects, the historical order data indicating a number of historical orders, an initiation frequency, and/or a time at which a historical order is initiated, corresponding to each object.

[0082] In some embodiments, the object information corresponding to the at least one recommended object includes at least one of: attribute information of a corresponding object, or information related to available virtual resources associated with the corresponding object.

[0083] In some embodiments, the target page includes a home page or a personal page of the user, and/or the object page includes an order initiation page corresponding to the target recommended object, the order initiation page providing a direct order initiation control for the target recommended object.

[0084] In some embodiments, the first area includes a detail entry associated with the at least one recommended object, and the object page switching module 420 is further configured to switch from the target page to an object detail page of the target object in response to detecting a trigger of the detail entry for the target recommended object.

[0085] In some embodiments, the recommended object determination module is further configured to receive a plurality of recommended objects to be presented in the first area; and select, from the plurality of

recommended objects, the at least one recommended object different from an object presented in a second area.

[0086] Fig. 5 shows a block diagram of an electronic device 500 in which one or more embodiments of the present disclosure may be implemented. It would be appreciated that the electronic device 500 shown in Fig. 5 is merely exemplary, and should not constitute any limitation on the functionalities and scope of the embodiments described herein. The electronic device 500 shown in Fig. 5 may be used to implement the terminal device 110 in Fig. 1.

[0087] As shown in Fig. 5, the electronic device 500 is in the form of a general-purpose electronic device. The components of the electronic device 500 may include, but are not limited to, one or more processing units or processors 510, a memory 520, a storage device 530, one or more communication units 540, one or more input devices 550, and one or more output devices 560. The processor 510 may be an actual or virtual processor and may perform various processes based on the programs stored in the memory 520. In a multi-processor system, multiple processors execute computer-executable instructions in parallel to improve the parallel processing capability of the electronic device 500.

[0088] The electronic device 500 typically includes multiple computer storage medium. Such medium may be any available medium that is accessible to the electronic device 500, including, but not limited to, volatile and non-volatile medium, and removable and non-removable medium. The memory 520 may be a volatile memory (for example, a register, cache, a random access memory (RAM)), a non-volatile memory (such as a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), a flash memory), or any combination thereof. The storage device 530 may be any removable or non-removable medium, and may include a machine-readable medium such as a flash drive, a disk, or any other medium, which may be used to store information and/or data and may be accessed within the electronic device 500.

[0089] The electronic device 500 may further include additional removable/non-removable, volatile/non-volatile memory medium. Although not shown in Fig. 5, a disk drive for reading from or writing to a removable, non-volatile disk (e.g., a "floppy disk"), and an optical disk drive for reading from or writing to a removable, non-volatile optical disk may be provided. In these cases, each drive may be connected to the bus (not shown) by one or more data medium interfaces. The memory 520 may include a computer program product 525 having one or more program modules configured to perform various methods or acts of the various embodiments of the present disclosure.

[0090] The communication unit 540 enables communication with other electronic devices through the communication medium. Additionally, the functions of the components of the electronic device 500 may be implemented by a single computing cluster or multiple computing machines, which may communicate through communication connections. Therefore, the electronic device 500 may use a logical connection with one or more other servers, a network personal computer (PC), or another network node to operate in a networked environment.

[0091] The input device 550 may be one or more input devices, such as a mouse, a keyboard, a tracking ball, etc. The output device 560 may be one or more output devices, such as a display, a speaker, a printer, etc. The electronic device 500 may also communicate with one or more external devices (not shown) as needed through the communication unit 540, such as a storage device, a display device, etc., communicate with one or more devices that enable the user to interact with the electronic device 500, or communicate with any devices (e.g., a network card, a modem, etc.) that enable the electronic device 500 to communicate with one or more other

electronic devices. Such communication may be performed via input/output (I/O) interfaces (not shown).

[0092] According to an exemplary implementation of the present disclosure, there is provided a computer-readable storage medium having stored thereon computer-executable instructions, where the computer-executable instructions are executed by a processor to implement the method described above. According to an exemplary implementation of the present disclosure, there is further provided a computer program product tangibly stored on a non-transitory computer-readable medium and including computer-executable instructions, the computer-executable instructions being executed by a processor to implement the method described above.

[0093] Various aspects of the present disclosure are described herein with reference to flowcharts and/or block diagrams of methods, apparatuses, devices, and computer program products implemented according to the present disclosure. It would be appreciated that each block of the flowcharts and/or block diagrams, and combinations of blocks in the flowcharts and/or block diagrams, may be implemented by computer-readable program instructions.

[0094] These computer-readable program instructions may be provided to a processing unit of a general-purpose computer, a special-purpose computer, or other programmable data processing apparatus to produce a machine, such that when the instructions are executed by the processing unit of the computer or other programmable data processing apparatus, an apparatus for implementing the functions/actions specified in one or more blocks of the flowcharts and/or block diagrams is produced. These computer-readable program instructions may also be stored in a computer-readable storage medium, and these instructions cause the computer, programmable data processing apparatus, and/or other devices to work in a specific manner, such that the computer-readable medium storing the instructions includes a manufactured product, which includes instructions for implementing various aspects of the functions/actions specified in one or more blocks of the flowcharts and/or block diagrams.

[0095] The computer-readable program instructions may be loaded onto a computer, other programmable data processing apparatus, or other devices, such that a series of operations and steps are performed on the computer, other programmable data processing apparatus, or other devices to generate a computer-implemented process, such that the instructions executed on the computer, other programmable data processing apparatus, or other devices implement the functions/actions specified in one or more blocks of the flowcharts and/or block diagrams.

[0096] The flowcharts and block diagrams in the drawings show the possibly implemented architectures, functions, and operations of the systems, methods, and computer program products according to multiple implementations of the present disclosure. In this regard, each block in the flowchart or block diagram may represent a module, program segment, or part of an instruction, which includes one or more executable instructions for implementing the specified logical functions. In some alternative implementations, the functions marked in the blocks may also occur in an order different from that marked in the drawings. For example, two consecutive blocks may actually be performed substantially in parallel, or they may sometimes be performed in the reverse order, depending on the functions involved. It would also be appreciated that each block of the block diagrams and/or flowcharts, and combinations of blocks in the block diagrams and/or flowcharts, may be implemented by special-purpose hardware-based systems that perform the specified functions or actions, or may be implemented by a combination of special-purpose hardware and computer instructions.

[0097] The implementations of the present disclosure have been described above, and the above description is

exemplary, non-exhaustive, and not limited to the disclosed implementations. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the described implementations. The terms used herein are chosen to best explain the principles, practical applications, or improvements to the technology in the market of the implementations, or to enable other those of ordinary skill in the art to understand the implementations disclosed herein.

CLAIMS

1. A method for presenting a recommended object, comprising:

presenting, in a first area of a target page, object information and an order entry control for each of at least one recommended object in response to detecting that the target page is presented, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set, wherein the first data set comprises:

historical behavior data related to a plurality of objects, the historical behavior data indicating that a predetermined type of interaction behavior is performed on the plurality of objects, and/or

historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for the objects in the set of objects; and

switching from the target page to an object page corresponding to a target recommended object in the at least one recommended object in response to detecting that the order entry control for the target recommended object is triggered, wherein an entry to initiate an order request for the target recommended object is provided in the object page.

2. The method of claim 1, further comprising determining the at least one recommended object by:

determining a first recommendation score corresponding to each object in the set of objects based on the historical behavior data, the first recommendation score indicating a probability of the user re-initiating an order for a corresponding object;

determining a second recommendation score corresponding to each object in the set of objects based on the historical order data, the second recommendation score indicating a probability of the target user group re-initiating an order for the object; and

selecting the at least one recommended object from the set of objects based on the first recommendation score and the second recommendation score corresponding to each object in the set of objects.

3. The method of claim 2, wherein determining the first recommendation score corresponding to each object in the set of objects based on the historical behavior data comprises:

determining a predicted score corresponding to each of the plurality of objects based on the historical behavior data, each predicted score indicating a purchase probability of the user for a corresponding object;

determining at least one candidate object for the user from the plurality of objects based on the predicted score corresponding to each of the plurality of objects; and

determining a first recommendation score corresponding to each object in the set of objects based on a similarity between each object in the set of objects and the at least one candidate object.

4. The method of claim 2, wherein determining the second recommendation score corresponding to each object in the set of objects based on the historical order data comprises:

determining an estimated order initiation period and/or an estimated order initiation frequency of each object in the set of objects based on the historical order data; and

determining the second recommendation score corresponding to each object in the set of objects based on the estimated order initiation period and/or the estimated order initiation frequency of each object in the set of objects.

5. The method of claim 1, wherein the at least one recommended object is further selected from the set of objects based on historical order data of each object in the set of objects, the historical order data indicating a number of historical orders, an initiation frequency, and/or a time at which a historical order is initiated, corresponding to each object.

6. The method of any of claims 1 to 5, wherein the object information corresponding to the at least one recommended object comprises at least one of:

attribute information of a corresponding object, or
information related to available virtual resources associated with the corresponding object.

7. The method of any of claims 1 to 6, wherein the target page comprises a home page or a personal page of the user, and/or

wherein the object page comprises an order initiation page corresponding to the target recommended object, the order initiation page providing a direct order initiation control for the target recommended object.

8. The method of any of claims 1 to 7, wherein the first area comprises a detail entry associated with the at least one recommended object, the method further comprising:

switching from the target page to an object detail page of the target object in response to detecting a trigger of the detail entry for the target recommended object.

9. The method of any of claims 1 to 8, further comprising determining the at least one recommended object by:

receiving a plurality of recommended objects to be presented in the first area; and
selecting, from the plurality of recommended objects, the at least one recommended object different from an object presented in a second area.

10. An apparatus for presenting a recommended object, comprising:

a query module configured to present, in a first area of a target page, object information and an order entry control for each of at least one recommended object in response to detecting that the target page is presented, the at least one recommended object being determined to be selected from a set of objects for which a user has initiated a historical order based on a first data set, wherein the first data set comprises:

historical behavior data related to a plurality of objects, the historical behavior data indicating that a predetermined type of interaction behavior is performed on the plurality of objects, and/or

historical order data of a target user group, the historical order data indicating a condition of the target user group initiating orders for the objects in the set of objects; and

an object page switching module configured to switch from the target page to an object page corresponding to a target recommended object in the at least one recommended object in response to detecting that the order entry control for the target recommended object is triggered, wherein an entry to initiate an order request for the target recommended object is provided in the object page.

11. An electronic device, comprising:

at least one processor; and

at least one memory, the at least one memory being coupled to the at least one processor and storing instructions executable by the at least one processor, the instructions, when executed by the at least one processor, causing the electronic device to perform the method of any of claims 1 to 9.

12. A computer-readable storage medium having stored thereon computer-executable instructions executable by a processor to implement the method of any of claims 1 to 9.

13. A computer program product tangibly stored in a computer storage medium and comprising computer-executable instructions, the computer-executable instructions, when executed by a device, causing the device to perform the method of any of claims 1 to 9.