

METHOD, APPARATUS, DEVICE AND MEDIUM FOR CONTENT PRESENTATION

[0001] The present application claims priority to Chinese Patent Application No. 202411103353.4, filed on August 12, 2024, and entitled "METHOD, APPARATUS, DEVICE, AND MEDIUM FOR CONTENT PRESENTATION", which is hereby incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] Example embodiments of the disclosure generally relate to the field of computer technologies, and in particular, to a method, an apparatus, a device, and a computer-readable storage medium for content presentation.

BACKGROUND

[0003] The Internet provides access to a wide variety of resources. For example, various applications, products, audio and video content, etc. may be accessed through the Internet. In addition, content delivery and service promotion through the Internet have become a new form of information dissemination and have been widely used. An advertising system supports displaying recommended content or services to users in different advertising display opportunities, allowing users to browse and obtain corresponding services according to their needs. Therefore, it is expected to improve interactive styles to enable users to obtain more information and services of interest.

SUMMARY

[0004] In a first aspect of the disclosure, a method for information interaction is provided. The method includes: in response to providing media content and an associated recommendation object to a user, receiving or requesting to determine, based at least on user attribute information of the user, at least one visual style for the recommendation object from a plurality of visual styles and a presentation strategy for the at least one visual style; and presenting, in accordance with the presentation strategy, recommendation content related to the recommendation object in the at least one visual style during a presentation of the media content.

[0005] In a second aspect of the disclosure, an apparatus for information interaction is provided. The apparatus includes: a determination module configured to, in response to providing media content and an associated recommendation object to a user, receive or request to determine, based at least on user attribute information of the user, at least one visual style for the recommendation

object from a plurality of visual styles and a presentation strategy for the at least one visual style; and a content presenting module configured to, present, in accordance with the presentation strategy, recommendation content related to the recommendation object in the at least one visual style during a presentation of the media content.

[0006] In a third aspect of the disclosure, an electronic device is provided. The device includes at least one processor; and at least one memory, the at least one memory is coupled to the at least one processor and stores instructions executable by the at least one processor, the instructions, when executed by the at least one processor, causes the device to perform the method of the first aspect.

[0007] In a fourth aspect of the disclosure, a computer-readable storage medium is provided. The medium has computer-executable instructions stored thereon, the computer-executable instructions, when executed by a processor, implement the method of the first aspect.

[0008] In a fifth aspect of the 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, cause the device to perform the method of the first aspect.

[0009] It would be appreciated that the content described in this section is neither intended to identify key or essential features of the embodiments of the disclosure, nor is it intended to limit the scope of the disclosure. Other features of the disclosure will be readily envisaged through the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The foregoing and other features, advantages, and aspects of the embodiments of the disclosure become more apparent with reference to the following detailed description and in conjunction with the drawings. In the drawings, the same or similar reference numerals denote the same or similar elements.

[0011] Fig. 1 is a schematic diagram of an example environment in which the embodiments of the disclosure may be implemented;

[0012] Figs. 2A to 2G and Figs.3A to 3D are schematic diagrams of example interfaces for content presentation according to some embodiments of the disclosure;

[0013] Fig. 4 is a flowchart of a process for content presentation according to some embodiments of the disclosure;

[0014] Fig. 5 is a block diagram of an apparatus for content presentation according to some embodiments of the disclosure; and

[0015] Fig. 6 is a block diagram of an electronic device in which one or more embodiments of the

disclosure may be implemented.

DETAILED DESCRIPTION OF EMBODIMENTS

[0016] The embodiments of the disclosure are described in more detail below with reference to the drawings. Although some embodiments of the disclosure are shown in the drawings, it would be appreciated that the disclosure may be implemented in various forms and should not be construed as limited to the embodiments set forth herein. Instead, these embodiments are provided for more thorough and complete understanding of the disclosure. It would be appreciated that the drawings and embodiments of the disclosure are only used for illustrative purposes, and are not used to limit the scope of protection of the disclosure.

[0017] In the description of the embodiments of the disclosure, the term "include/comprise" and similar terms thereto should be construed as open-ended inclusions, that is, "include/comprise but not limited to". The term "based on" should be construed as "at least partially based on". The term "one embodiment" or "the embodiment" should be construed as "at least one embodiment". The term "some embodiments" should be construed as "at least some embodiments". Other explicit and implicit definitions may also be included below.

[0018] It would be understood that the data involved in the technical solution (including but not limited to the data itself, acquisition or use of the data) should comply with requirements of corresponding laws, regulations, and related provisions.

[0019] It would be understood that before using the technical solutions disclosed in the embodiments of the disclosure, the user should be informed of the type, range of use, use scenarios, etc., of personal information involved in the disclosure and obtain authorization from the user in an appropriate manner in accordance with relevant laws and regulations.

[0020] 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, so that 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 disclosure.

[0021] As an optional but non-restrictive 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. In addition, the pop-up window may also include a selection control for the user to select "agree" or "disagree" to provide the personal information to the electronic device.

[0022] It would be understood that the above process of notifying and acquiring user authorization is only illustrative and does not limit the implementations of the disclosure, and other manners that satisfy the relevant laws and regulations may also be applied to the implementations of the disclosure.

[0023] Fig. 1 is a schematic diagram of an example environment 100 in which the embodiments of the disclosure may be implemented. One or more recommendation requesters may use a recommendation management system 150 to manage content to be delivered on a content delivery platform 110. One or more client devices 130-1, 130-2, 130-3, etc. (collectively or individually referred to as client device 130 for ease of discussion) are associated with the content delivery platform 110, and may access various types of content provided on the content delivery platform 110, for example, based on corresponding users 132-1, 132-2, 132-3, etc. (collectively or individually referred to as user 132 for ease of discussion). As an example, the content delivery platform 110 may be an application, a website, a web page, and other accessible platforms. The client device 130 may be installed with an application for accessing the content delivery platform 110, or may access the content delivery platform 110 in a suitable manner.

[0024] The content delivery platform 110 may be configured to deliver one or more specific recommendation contents (for example, provided or presented on the client device 130) related to one or more services to a user group based on a corresponding strategy. The recommendation content to be delivered may include, for example, one or more pieces of recommendation content 122-1, 122-2,..., 122-M (collectively or individually referred to as recommendation content 122 for ease of discussion) in a recommendation content database 120.

[0025] As used herein, a service may include various recommendable objects, examples of which may include applications, physical products/services, virtual products/services, digital content/physical content, and the like. As used herein, the "recommendation content" refers to content presented to recommend a corresponding service. An example of the recommendation content may include an advertisement. As used herein, the user group may include one or more user members, such as user 132. The user member may be any potential consumer of the service, such as a user, a group, an organization, an entity, and the like.

[0026] In some embodiments, the content delivery platform 110 may distribute the corresponding recommendation content 122 to the user 130 based on requests from recommendation requesters 152-1, 152-2, 152-3, etc. (collectively or individually referred to as "recommendation requester" 152). In a scenario of advertisement delivery, the recommendation requester is sometimes also referred to as an advertiser. In some embodiments, the recommendation content to be presented to a specific client device 130 in a content presentation opportunity (for example, at a specific time

and a specific location) of the content delivery platform 110 may be selected based on a bidding result.

[0027] In some embodiments, the recommendation requester may also pay the provider of the content delivery platform 110 based on the presentation of the recommendation content and subsequent conversions. In some embodiments, conversion behaviors performed by the user on the recommendation content may include but are not limited to: viewing, clicking, downloading, paying, adding to shopping cart, placing an order, etc., for the recommendation content. The specific conversion behavior is related to the recommended service and the service provider.

[0028] In the environment 100, the client device 130 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 thereof, including fittings and peripherals of these devices or any combination thereof. In some embodiments, the client device 130 may also support any type of user-specific interface (such as a "wearable" circuit, etc.).

[0029] In the environment 100, the content delivery platform 110, and/or the recommendation management system 150 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, and the like. Although shown separately, one or more of the content delivery platform 110 and/or the recommendation management system 150 may be combined.

[0030] It would be appreciated that the components and arrangements in the environment shown in Fig. 1 are only examples, and a computing system suitable for implementing the example embodiments described in the disclosure may include one or more different components, other components, and/or different arrangements.

[0031] Conventionally, when the media content associated with the recommendation object starts to be presented to the user, the terminal device presents the recommendation content related to the recommendation object in a form of a single-line card, which may present small amount of recommendation content. As the duration of the user for viewing current media content increases (for example, after reaching n seconds), the terminal device may also expand the card size and present the card with more recommendation content in a form of a double-line card, for example, supplementarily present comment information, sales information, and the like.

[0032] Further, since the switching timing of the visual style of the recommendation content is

determined according to a preset hard strategy (for example, switching after watching a video for n seconds), it is difficult to achieve personalized presentation to the user, so that the user cannot obtain satisfactory recommendation content in a timely and accurate manner, and the conversion of the user to the recommendation object cannot be improved.

[0033] According to the embodiments of the disclosure, an improved information interaction solution is provided. According to the solution, in response to providing media content and an associated recommendation object to a user, at least one visual style for the recommendation object from multiple visual styles and a presentation strategy for the at least one visual style are determined based at least on user attribute information of the user. A terminal device may receive the at least one visual style and the presentation strategy for the at least one visual style, or may request a server device to determine the at least one visual style and the associated presentation strategy. During the presentation of the media content, the terminal device may present recommendation content related to the recommendation object in the at least one visual style in accordance with the presentation strategy. Therefore, the appearance style and presentation strategy of the specific recommendation content when presenting the recommendation object to the user may be dynamically determined based on the user-related information, so that different users may obtain cards with different content recommendation manners for different recommendation objects.

[0034] Some example embodiments of the disclosure are described below with continued reference to the drawings. It would be appreciated that the interfaces shown in the drawings are only examples, and there may be various interface designs. Each graphic element in the interface 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 disclosure are not limited in this regard.

[0035] Hereinafter, the example embodiments will be mainly described with respect to the content delivery platform 110. It would be appreciated that the actions described with respect to the terminal device 130 may also be performed by the content delivery platform 110, or may be performed by the terminal device 130 in cooperation with its serving side (for example, the content delivery platform 110). In some embodiments, in a scenario where the action is performed by the terminal device 130 in cooperation with its serving side (for example, a server), the terminal device 130 may request the content delivery platform 110 to determine the visual style and presentation strategy for the recommendation object associated with the media content in a case where it is detected that the media content needs to be provided to the user. The terminal device 130 may receive an indication of the visual style and the presentation strategy directly from the content

delivery platform 110 or from the content delivery platform 110 after initiating the request, and present the recommendation content in the indicated visual style in accordance with the indicated presentation strategy during the presentation of the media content.

[0036] Figs. 2A to 2G and Figs. 3A to 3D are schematic diagrams of example interfaces 200A to 200G and interfaces 300A to 300D for content presentation according to some embodiments of the disclosure.

[0037] In some embodiments, if the media content and the associated recommendation object are to be provided to the user, the terminal device 130 receives, from the content platform 110, at least one visual style for the recommendation object from the multiple visual styles and a presentation strategy for the at least one visual style based at least on the user attribute information of the user. The terminal device 130 may also request to determine, from the content platform 110, the at least one visual style for the recommendation object from the multiple visual styles and the presentation strategy for the at least one visual style based on the user attribute information of the user.

[0038] In some embodiments, the media content provided by the terminal device 130 to the user 132 may be a video, an image, an image set, an image-text content, etc., in an information flow or a live stream.

[0039] In some embodiments, the recommendation object indicates an object that the recommendation requester needs to deliver to the user, for example, a single product, a certain product category, an entire store, a service, and the like. In some embodiments, the recommendation object is associated with the media content by a poster of the media content, so as to be presented to the user along with the media content, thereby achieving a purpose of recommending the object. The recommendation content provided while presenting the media content is also referred to as card recommendation content. It would be understood that the terminal device 130 may further provide the recommendation object associated with the media content while providing the media content to the user 132. That is, when the media content is presented in an interface of the user 132, the associated presentation recommends the requester 152 about the recommendation content corresponding to the recommendation object that needs to be recommended. For example, in an e-commerce scenario, the recommendation object includes a product configured to be presented along with a video. In some other examples, for an advertisement delivery scenario, the terminal device 130 presents the delivered advertisement corresponding to the recommendation object while providing the media content to the user 132.

[0040] In some embodiments, the user attribute information of the user may include the user's historical behavior data, and the user's historical behavior may include, for example, but is not limited to, whether the user has performed a specific conversion behavior (for example, clicking,

adding to shopping cart, placing an order, purchasing, forwarding, liking, favoriting, downloading, etc.) on the presented recommendation object within a period of time in the past. Alternatively or additionally, the user attribute information of the user may include whether the user has watched the media content with the recommendation object completely within a period of time in the past, whether the user has performed a search for a specific object or the media content within a period of time in the past, and the like. Alternatively or additionally, the user attribute information of the user may further include an object category that the user is interested in, for example, whether the user is interested in clothing products, whether the user is interested in products in a specific clothing classification or clothing brand, and the like. The user attribute information of the user may further include an object price range that the user is interested in or a price discount activity that the user is interested in, and the like. It would be appreciated that only example user attribute information is listed here. In practical applications, more, less, or other user-related information may be considered as needed, as long as such information helps determine the user's interest in the recommendation object.

[0041] In some embodiments, the multiple visual styles respectively indicate different recommendation contents related to the recommendation object and/or different appearance styles of the recommendation content. In some examples, the multiple visual styles may indicate a basic improved style, styles with different reinforcement degrees (for example, with three degrees of reinforcement effects: weak, medium, and strong), and the like. For example, style reinforcement refers to continuously adding content (from providing basic information, to providing price information, to providing a shopping entry), which is not limited in the disclosure. As shown in example interfaces 200A to 200D in Figs. 2A to 2D, firstly, the recommendation content 210 presented in the improved style includes basic information related to the recommendation object. Secondly, the recommendation content 220 presented in the weak reinforcement style includes the basic information and price information related to the recommendation object. Finally, the recommendation content 230 presented in the medium reinforcement style and the recommendation content 240 presented in the high reinforcement style may include the basic information, price information, and shopping entry related to the recommendation object.

[0042] It would be appreciated that only the example recommendation content for the specific recommendation object is given here, and in practical applications, different recommendation contents may be configured for different visual styles depending on the specific object and specific needs. The recommendation content indicated by different visual styles may be new recommendation content continuously superimposed on the basis of the recommendation content of other visual styles, or may indicate completely different recommendation content, which is not

limited in the embodiments of the disclosure.

[0043] In some examples, for the same content, the style reinforcement may also be reinforcement of an appearance style of the recommendation content, so that the user may more easily notice the corresponding content from the appearance. The reinforcement of the appearance style includes but is not limited to highlighting/enlarging at least part of the recommendation content, and the like. For example, the card may be enlarged, the price may be highlighted, the shopping entry may be highlighted, and the like, which is not limited in the disclosure. As shown in the example interfaces 200A to 200D in Figs. 2A to 2D, compared with the recommendation content 210 presented in the card style, the recommendation content 220 is presented in an enlarged card style. Compared with the recommendation content 220 presented in the card style, the recommendation content 230 is presented in an enlarged card style. With respect to the price information 221, the price information 231 is presented in a predetermined appearance style (for example, highlighted, bolded, etc.). With respect to the access entry (for example, purchase entry) 232, the access entry (for example, purchase entry) 241 is presented in a predetermined appearance style (for example, highlighted, bolded, etc.). The reinforcement of the appearance style presented in the figure is only an example, and in practical applications, different appearance styles may be configured for different visual styles depending on the specific object and specific needs, and some of the appearance styles may present the recommendation content more prominently.

[0044] In some embodiments, the terminal device 130 determines, based on the user attribute information of the user 132, at least one visual style for the recommendation object and a presentation strategy for the at least one visual style from a basic style, an improved style, and styles with different reinforcement degrees (for example, weak, medium, and strong after reinforcement). In some implementations, the presentation strategy may indicate a presentation timing of each visual style. For example, any one of the multiple visual styles is presented at the time of 0 second when the media content is presented. Any one of the multiple visual styles is presented after n seconds when the media content is presented.

[0045] In some embodiments, the presentation strategy may further indicate a presentation order of two or more visual styles in a case where the two or more visual styles are determined for the recommendation object. For example, the basic style is presented first, the improved style is presented after n seconds, and then a certain reinforcement style is presented after another n seconds; or the most basic style is presented first, and then a certain reinforcement style is presented after n seconds; or styles with different degrees are gradually presented (every n seconds) from the basic style. In some examples, n may be set to different sizes to implement different presentation strategies. The determination of the visual style and the presentation strategy by the

terminal device 130 based on the user attribute information of the user is described below in detail with continued reference to Figs. 2A to 2G and Figs. 3A to 3D.

[0046] In some embodiments, the terminal device 130 presents, in accordance with the presentation strategy, the recommendation content related to the recommendation object in the at least one visual style during the presentation of the media content. In some embodiments, the recommendation content indicated by one or more of the multiple visual styles includes at least an access entry for the recommendation object. For example, a purchase entry or an entry for a details page. In some embodiments, the recommendation content indicated by one or more of the multiple visual styles may further include at least a virtual resource to be consumed to obtain the recommendation object, such as a product price. In some embodiments, the recommendation content related to the recommendation object may include but is not limited to, information such as visual information corresponding to the object, an object name, an object description, the number of comments, the number of sales, a price, an access entry, and the like. In some embodiments, the recommendation content related to the recommendation object may also be referred to as a card or a card advertisement. In some examples, the card or card advertisement related to the recommendation object may be presented in a card style.

[0047] For ease of understanding, the improved style and the styles with different reinforcement degrees (for example, weak, medium, and strong after reinforcement) are described below with reference to Figs. 2A to 2D. However, this is only illustrative, and the disclosure is not limited thereto.

[0048] As shown in the example interface 200A in Fig. 2A, the terminal device 130 may present the recommendation content 210 (also referred to as a recommendation card, because the recommendation content is superimposed and presented on the media content in a form of a card) related to the recommendation object in the improved style in accordance with the presentation strategy during the presentation of the media content. In some embodiments, the recommendation card 210 includes picture information 211 corresponding to the object, an object name 212, the number of comments 213, and the number of sales 214. As shown in the example interface 200B in Fig. 2B, the terminal device 130 may present the recommendation content (also referred to as a recommendation card) 220 related to the recommendation object in the weak reinforcement style in accordance with the presentation strategy during the presentation of the media content. The recommendation card 220 includes information 221 such as picture information corresponding to the object, an object name, the number of comments, the number of sales, and a price.

[0049] As shown in the example interface 200C in Fig. 2C, the terminal device 130 may also present the recommendation content (also referred to as a recommendation card) 230 related to the

recommendation object in the medium style after reinforcement in accordance with the presentation strategy during the presentation of the media content. The recommendation card 230 includes information 231 such as picture information corresponding to the object, an object name, the number of comments, the number of sales, and a price displayed in a different appearance style (for example, highlighted), and an access entry 232. As shown in the example interface 200D in Fig.2D, the terminal device 130 may also present the recommendation content (also referred to as a recommendation card) 240 related to the recommendation object in the reinforcement style after reinforcement in accordance with the presentation strategy during the presentation of the media content. The recommendation card 240 includes information such as picture information corresponding to the object, an object name, the number of comments, the number of sales, and a price displayed in a different appearance style (for example, highlighted), and an access entry 241 displayed in a different appearance style (for example, highlighted).

[0050] The determination of the visual style and the presentation strategy by the terminal device 130 based on the user attribute information of the user is described below in detail with continued reference to Figs. 2A to 2G.

[0051] In some embodiments, the terminal device 130 may determine the at least one visual style for the recommendation object and the presentation strategy in the following manner based on the user attribute information of the user. The terminal device 130 determines an association degree between the user and the recommendation object based at least on the user attribute information of the user. Generally, if the association degree between the user and the recommendation object is higher, the probability or confidence of the conversion behavior of the user to the recommendation object may be higher. Therefore, based on the prediction of the association degree, it may be further determined whether the current user may perform a predetermined conversion behavior on the recommendation object, and the visual style and presentation strategy of the recommendation content may be guided accordingly.

[0052] In some examples, the terminal device 130 determines a possibility of the user performing clicking, adding to shopping cart, placing an order, purchasing, etc., on the recommendation object, or the user performing forwarding, liking, favoriting, etc., on a tutorial, or the user performing downloading and the like on an application software based on the user's historical behavior data, the object category that the user is interested in, the object price range that the user is interested in, and the like, and then may obtain the association degree between the user and the recommendation object.

[0053] Then, the terminal device 130 determines the at least one visual style for the recommendation object and the presentation strategy based on the determined association degree

between the user and the recommendation object. For example, if the determined association degree is high, the terminal device 130 may directly present the recommendation card 240 when providing the media content. If the determined association degree is medium, the terminal device 130 may present the recommendation card 230 first when providing the media content, and then present the recommendation card 240 after n seconds.

[0054] In some embodiments, the terminal device 130 may further determine the at least one visual style for the recommendation object and the presentation strategy in the following manner based on the user attribute information of the user and object attribute information of the recommendation object. The terminal device 130 determines an association degree between the user and the recommendation object based on the user attribute information of the user and the object attribute information of the recommendation object. In some embodiments, the object attribute information may indicate a category of the object, description information of the object, information related to an object set (for example, a store) to which the object belongs, and the like.

[0055] In some examples, the terminal device 130 determines, based on the user attribute information of the user and the information such as the object category, the object description information, and the information related to the object set (for example, the store) to which the object belongs, a possibility of the user performing clicking, adding to shopping cart, placing an order, purchasing, etc., on the object, or the user performing forwarding, liking, favoriting, etc., on the object, or the user performing downloading, etc., on the application software.

[0056] Then, the terminal device 130 determines the at least one visual style for the recommendation object and the presentation strategy based on the determined association degree. For example, if the determined association degree is medium, the terminal device 130 may directly present the recommendation card 230 when providing the media content. If the determined association degree is relatively low, the terminal device 130 may present the recommendation card 210 first when providing the media content, and then present the recommendation card 230 after n seconds.

[0057] In some embodiments, if the association degree falls within a first association degree range, at least a first visual style and/or a first presentation strategy are determined. If the association degree falls within a second association degree range, at least a second visual style and/or a second presentation strategy are determined. A value range of the second association degree range is greater than a value range of the first association degree range. The recommendation content indicated by the second visual style includes the recommendation content indicated by the first visual style and additional recommendation content. In some embodiments, the recommendation content indicated by the second visual style may be completely different from the recommendation

content indicated by the first visual style.

[0058] If the association degree between the user and the recommendation object is relatively large (which means that the user has a higher possibility of performing the conversion behavior on the recommendation object), the terminal device 130 determines to use a more strong reinforcement visual style to present the corresponding recommendation card of the recommendation object, and the "reinforcement" here may at least reflect that more recommendation content is presented. For example, as the predicted probability of the user performing the conversion behavior increases, the price information of the object and the access entry (for example, the entry to add to the shopping cart) of the object are gradually added. As shown in Figs. 2A to 2C, from the recommendation card 210 to the recommendation card 220, and from the recommendation card 220 to the recommendation card 230, the displayed content is gradually increased.

[0059] An appearance style of at least part of the recommendation content indicated by the second visual style is presented more prominently than an appearance style of at least part of the recommendation content indicated by the first visual style. In some examples, the "reinforcement" may also be reflected in highlighted/enlarged presentation of the content. As shown in Figs. 2B to 2D, from the recommendation card 220 to the recommendation card 230, the product price information 231 is highlighted. From the recommendation card 230 to the recommendation card 240, the recommendation content remains unchanged, but the access entry 241 is highlighted.

[0060] Alternatively, or in addition, in a case where the association degree is higher, the presentation timing of the second visual style in the corresponding second presentation strategy is earlier than the presentation timing of the first visual style in the first presentation strategy selected when the association degree is lower. In some examples, if the association degree between the user and the recommendation object is higher, a certain visual style of the recommendation content may be presented earlier. As shown in Fig. 2C, in a case where the terminal device 130 determines to use the recommendation card 230: when the association degree between the user and the recommendation object is relatively low, the recommendation card 230 may be presented only at the nth second; and when the association degree between the user and the recommendation object is relatively high, the recommendation card 230 may be presented at the 0th second. In some embodiments, different presentation timings of the recommendation card may be set for different association degree ranges, and the different presentation timings may be selected from values such as 0 second, 1 second, 2 seconds, 3 seconds, and the like. The embodiments of the disclosure are not limited in this regard.

[0061] By displaying recommendation cards in different styles based on different timings and reinforcing the expression style of the recommendation card in the above manner, the attention of

the user may be attracted, thereby improving the conversion rate. The prompt information of the virtual resource presented in association with the recommendation content by the content delivery platform is described below with continued reference to Figs. 3A to 3D.

[0062] In some embodiments, when presenting the recommendation content in association with the media content, a virtual resource available for the user may also be presented at the same time. As used herein, the "virtual resource" refers to various virtual resources that may be provided to the user. Different types of virtual resources may include, for example, but are not limited to, red envelopes, coupons, and rewards (for example, virtual points, virtual coins, coupons, and the like) granted to the user before, during, or after the user performs a specific conversion behavior (for example, placing an order for purchase, forwarding, and the like).

[0063] In some embodiments, one or more of the multiple visual styles may be configured to present the prompt information corresponding to the virtual resource associated with the recommendation object as additional recommendation content with respect to other visual styles. For example, if it is determined to present the recommendation content in the second visual style in a case where the association degree between the user and the recommendation object is higher, the recommendation content corresponding to the second visual style includes the prompt information corresponding to the virtual resource in addition to other content. In this way, in the case where the association degree between the user and the recommendation object is higher, by presenting the prompt information corresponding to the virtual resource to the user, the user may be informed of the recommendation object of interest and may also learn about the virtual resource associated with the recommendation object, so that whether or how to perform a follow-up action on the recommendation object may be better determined.

[0064] In some embodiments, the terminal device 130 determines whether the user satisfies a requirement for obtaining the virtual resource. In some examples, the content platform 110 may determine whether the user satisfies the requirement for obtaining the virtual resource such as a coupon, points, or virtual coins. In some examples, different types of virtual resources correspond to different obtaining requirements. For example, if the user is a new user, he or she may obtain virtual resources such as coupon or virtual coins for a new user. If the user is a member user or the user has placed orders multiple times, these users may obtain a corresponding amount of coupons, a corresponding number of virtual coins, and the like. The user may also obtain a coupon by placing an order, obtain virtual coins by favoriting, obtain virtual coins by forwarding, obtain a coupon by downloading, and the like.

[0065] In some embodiments, if the terminal device 130 determines that the user satisfies the requirement for obtaining the virtual resource, the terminal device 130 presents the prompt

information corresponding to the virtual resource in association with the recommendation content during the presentation of the media content. For example, for a new user coupon obtained by the user, the prompt information corresponding to the virtual resource presented by the terminal device 130 for the first time may be "Congratulations on receiving a new user coupon of X yuan". For the new user coupon obtained by the user, the prompt information corresponding to the virtual resource presented by the terminal device 130 for the non-first time may be "A new user coupon of X yuan is available". For another example, the prompt information corresponding to the virtual resource presented by the terminal device 130 may be "obtain XXX virtual coins when placing an order". The prompt information corresponding to the virtual resource presented by the terminal device 130 may also be "obtain a XX platform coupon package when placing an order". In some embodiments, the prompt information corresponding to the virtual resource presented by the terminal device 130 may be configured, and the disclosure does not limit this.

[0066] In some embodiments, no matter how the visual style of the recommendation content changes, the prompt information corresponding to the target type of virtual resource may always be presented in a fixed visual style. As shown in the example interfaces 300A to 300D in Figs. 3A to 3D, the terminal device 130 may present, in association in the recommendation card 310, the prompt information 311 corresponding to the virtual resource. The terminal device 130 may, in association in the recommendation card 320, present the prompt information 321 corresponding to the virtual resource. The terminal device 130 may present, in association in the recommendation card 330, the prompt information 331 corresponding to the virtual resource. The terminal device 130 may present, in association in the recommendation card 340, the prompt information 341 corresponding to the virtual resource.

[0067] In this way, the user may also be shown the information for obtaining the virtual resource while providing the recommendation content, which may allow the user to learn more information related to the recommendation object, and thus may further help the user determine whether to perform certain conversion behaviors on the recommendation object.

[0068] In some embodiments, if it is determined that the user satisfies the requirements for obtaining multiple types of virtual resources, the terminal device 130 may determine a target type of virtual resource from the multiple types of virtual resources based on at least one of the user attribute information of the user and the object attribute information of the recommendation object. Then, the prompt information corresponding to the target type of virtual resource is presented in association with the recommendation content during the presentation of the media content. It would be appreciated that the visual style of the prompt information may also change with the visual style of the recommendation content.

[0069] In some embodiments, the priorities of the multiple types of virtual resources may be determined based on the user attribute information and/or the object attribute information. After determining the priorities of the multiple types of virtual resources, it is possible to select, in accordance with an order of the priorities, the prompt information corresponding to the virtual resource with the highest priority to display to the user, or display the prompt information corresponding to different types of virtual resources in sequence.

[0070] In some examples, if the user obtains multiple types of virtual resources (which may also be referred to as benefit points and/or playing methods) at the same time, the terminal device 130 evaluates a certain type of virtual resource based on the user's order history behavior/historical interest model, and the type of virtual resource may help improve the association degree between the user and the current recommendation object (that is, improve the possibility of the user performing conversion on the recommendation object). For example, the terminal device 130 may determine to preferentially present a certain type of virtual resource among the multiple types of virtual resources to the user based on the user's order history behavior/historical interest model and the object attribute information (for example, a category/price of a product or the like). For example, for a product priced at 200 yuan, a 10-yuan coupon for new users is preferentially presented. However, for a product priced at 2,000 yuan, the discount of the coupon for new users is less than the virtual coins returned when placing an order, and therefore the prompt information of "Earn virtual coins when placing an order" may be preferentially presented.

[0071] In this way, it is possible to dynamically determine which type of virtual resource to display the corresponding prompt information for based on the specific situation of the current user and the specific situation of the recommendation object. Therefore, a more matched virtual resource type may be determined to display to the user.

[0072] The process of presenting the details page based on the user's clicking on the recommendation card is described below with reference to Figs. 2A to 2G. As shown in the example interfaces 200D to 200G in Figs. 2A to 2G, the user 132 may view the details page 251 of the object by clicking on the recommendation card 210, the recommendation card 220, the recommendation card 230 (for example, other than the access entry 232), and the recommendation card 240 (for example, other than the access entry 241). The user 132 may view the details page 261 (for example, a page to submit the purchase) of the object by clicking on the access entry 241. Subsequently, the user 132 clicks on a "Buy Now" control to view the order confirmation page 271 (for example, a page to submit the purchase).

[0073] In summary, by displaying recommendation content in different styles based on different timings and reinforcing the expression style of the recommendation content, the click-through rate

of the recommendation content (for example, the recommendation content in the card style) presented in the media content is improved, thereby increasing the conversion rate for the recommendation object.

[0074] Fig.4 is a flowchart of a process 400 for information interaction according to some embodiments of the disclosure. In some embodiments, the process 400 may be implemented at the content delivery platform 110. For the purpose of explanation, the process 400 is described below from the perspective of the content delivery platform 110.

[0075] At block 410, the content delivery platform 110, in response to providing media content and an associated recommendation object to a user, receives or requests to determine, based at least on user attribute information of the user, at least one visual style for the recommendation object from a plurality of visual styles and a presentation strategy for the at least one visual style.

[0076] At block 420, the content delivery platform 110 presents, in accordance with the presentation strategy, recommendation content related to the recommendation object in the at least one visual style during a presentation of the media content.

[0077] In some embodiments, the plurality of visual styles respectively indicates different recommendation content and/or different appearance styles of recommendation content related to the recommendation object.

[0078] In some embodiments, the presentation strategy indicates at least one of: a presentation timing of each visual style, or a presentation order of two or more visual styles in a case where two or more visual styles are determined for the recommendation object.

[0079] In some embodiments, receiving or requesting to determine the at least one visual style for the recommendation object and the presentation strategy based at least on the user attribute information of the user includes: receiving or requesting to determine an association degree between the user and the recommendation object based at least on the user attribute information of the user; and receiving or requesting to determine the at least one visual style for the recommendation object and the presentation strategy based on the determined association degree.

[0080] In some embodiments, receiving or requesting to determine the association degree between the user and the recommendation object includes: receiving or requesting to determine the association degree between the user and the recommendation object based on the user attribute information of the user and object attribute information of the recommendation object.

[0081] In some embodiments, determining the at least one visual style for the recommendation object and the presentation strategy includes: determining at least a first visual style and/or a first presentation strategy in response to the association degree falling within a first association degree range; and determining at least a second visual style and/or a second presentation strategy in

response to the association degree falling within a second association degree range, a value range of the second association degree range being greater than a value range of the first association degree range, and where recommendation content indicated by the second visual style includes recommendation content indicated by the first visual style and additional recommendation content, and/or an appearance style of at least part of the recommendation content indicated by the second visual style is presented more prominently than an appearance style of at least part of the recommendation content indicated by the first visual style, and/or where a presentation timing of the second visual style in the second presentation strategy is earlier than a presentation timing of the first visual style in the first presentation strategy.

[0082] In some embodiments, the additional recommendation content includes at least prompt information corresponding to a virtual resource associated with the recommendation object.

[0083] In some embodiments, the process 400 further includes: presenting, in association with the recommendation content, the prompt information corresponding to the virtual resource during the presentation of the media content in response to determining that the user satisfies a requirement for obtaining the virtual resource.

[0084] In some embodiments, presenting the prompt information includes: in response to determining that the user satisfies the requirement for obtaining a plurality of types of virtual resources, determining a target type of virtual resource from the plurality of types of virtual resources based on at least one of the user attribute information of the user and the object attribute information of the recommendation object; and presenting, in association with the recommendation content, prompt information corresponding to the target type of virtual resource during the presentation of the media content.

[0085] In some embodiments, the recommendation content indicated by one or more of the plurality of visual styles includes at least: an access entry for the recommendation object, and/or a virtual resource to be consumed to obtain the recommendation object.

[0086] Fig.5 is a schematic structural block diagram of an apparatus 500 for information interaction according to some embodiments of the disclosure. The apparatus 500 may be implemented as or included in the content delivery platform 110. Each module/component in the apparatus 500 may be implemented by hardware, software, firmware, or any combination thereof.

[0087] As shown in the figure, the apparatus 500 includes a receiving or requesting determination module 510 configured to, in response to providing media content and an associated recommendation object to a user, receive or request to determine, based at least on user attribute information of the user, at least one visual style for the recommendation object from a plurality of visual styles and a presentation strategy for the at least one visual style. The apparatus 500 includes

a content presenting module 520 configured to present, in accordance with the presentation strategy, recommendation content related to the recommendation object in the at least one visual style during a presentation of the media content.

[0088]In some embodiments, the plurality of visual styles respectively indicates different recommendation content and/or different appearance styles of recommendation content related to the recommendation object.

[0089]In some embodiments, the presentation strategy indicates at least one of: a presentation timing of each visual style, or a presentation order of two or more visual styles in a case where two or more visual styles are determined for the recommendation object.

[0090]In some embodiments, the determining module 510 is further configured to receive or request to determine an association degree between the user and the recommendation object based at least on the user attribute information of the user; and receive or request to determine the at least one visual style for the recommendation object and the presentation strategy based on the determined association degree.

[0091]In some embodiments, the receiving or requesting determination module 510 is further configured to receive or request to determine the association degree between the user and the recommendation object based on the user attribute information of the user and object attribute information of the recommendation object.

[0092]In some embodiments, the receiving or requesting determination module 510 is further configured to determine at least a first visual style and/or a first presentation strategy in response to the association degree falling within a first association degree range; and determine at least a second visual style and/or a second presentation strategy in response to the association degree falling within a second association degree range, a value range of the second association degree range being greater than a value range of the first association degree range, wherein recommendation content indicated by the second visual style includes recommendation content indicated by the first visual style and additional recommendation content, and/or an appearance style of at least part of the recommendation content indicated by the second visual style is presented more prominently than an appearance style of at least part of the recommendation content indicated by the first visual style, and/or wherein a presentation timing of the second visual style in the second presentation strategy is earlier than a presentation timing of the first visual style in the first presentation strategy.

[0093]In some embodiments, the additional recommendation content includes at least prompt information corresponding to a virtual resource associated with the recommendation object.

[0094]In some embodiments, the apparatus 500 further includes a prompt information presenting

module configured to present, in association with the recommendation content, the prompt information corresponding to the virtual resource during the presentation of the media content in response to determining that the user satisfies a requirement for obtaining the virtual resource.

[0095] In some embodiments, the prompt information presenting module is configured to, in response to determining that the user satisfies the requirement for obtaining a plurality of types of virtual resources, determine a target type of virtual resource from the plurality of types of virtual resources based on at least one of the user attribute information of the user and the object attribute information of the recommendation object; and present, in association with the recommendation content, prompt information corresponding to the target type of virtual resource during the presentation of the media content.

[0096] In some embodiments, the recommendation content indicated by one or more of the plurality of visual styles includes at least: an access entry for the recommendation object, and/or a virtual resource to be consumed to obtain the recommendation object.

[0097] Fig. 6 is a block diagram of an electronic device 600 in which one or more embodiments of the disclosure may be implemented. It would be appreciated that the electronic device 600 shown in Fig. 6 is only illustrative, and should not constitute any limitation on the functionality and scope of the embodiments described herein. The electronic device 600 shown in Fig. 6 may be used to implement the client device 130, or the content delivery platform 110, the recommendation conversion component 140, and/or the recommendation management system 150 (or each component therein). The electronic device 600 may include or be implemented as the apparatus 600 in Fig. 6.

[0098] As shown in Fig. 6, the electronic device 600 is in a form of a general-purpose computing device. The components of the electronic device 600 may include, but are not limited to, one or more processing units or processors 610, a memory 620, a storage device 630, one or more communication units 640, one or more input devices 650, and one or more output devices 660. The processor 610 may be an actual or virtual processor, and may perform various processes based on the programs stored in the memory 620. In a multi-processor system, multiple processors execute computer executable instructions in parallel to improve the parallel processing capability of the electronic device 600.

[0099] The electronic device 600 typically includes multiple computer storage medium. Such medium may be any available medium accessible by the electronic device 600, including but not limited to volatile and non-volatile medium, removable and non-removable medium. The memory 620 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 630 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 (for example, training data for training) and may be accessed within the electronic device 600.

[0100] The electronic device 600 may further include additional removable/non-removable, volatile/non-volatile memory medium. Although not shown in Fig. 6, it is possible to provide a disk driver for reading from or writing into removable and non-volatile disks (such as a "floppy disk"), and an optical disk driver for reading from or writing into removable and non-volatile optical disks. In these cases, each driver may be connected to the bus (not shown) by one or more data medium interfaces. The memory 620 may include a computer program product 625, which has one or more program modules configured to perform various methods or acts of the various embodiments of the disclosure.

[0101] The communication unit 640 implements communication with other electronic devices through the communication medium. Additionally, the functions of the components of the electronic device 600 may be implemented by a single computing cluster or multiple computing machines, which may communicate through communication connections. Therefore, the electronic device 600 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.

[0102] The input device 650 may be one or more input devices, such as a mouse, a keyboard, a tracking ball, etc. The output device 660 may be one or more output devices, such as a display, a speaker, a printer, etc. The electronic device 600 may also communicate with one or more external devices (not shown) as needed through the communication unit 640, the external devices 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 600, or communicate with any devices (for example, a network card, a modem, etc.) that enable the electronic device 600 to communicate with one or more other electronic devices. Such communication may be performed via input/output (I/O) interfaces (not shown).

[0103] According to an illustrative implementation of the disclosure, there is provided a computer-readable storage medium having computer-executable instructions stored thereon, where the computer-executable instructions are executed by a processor to implement the method described above. According to an illustrative implementation of the disclosure, there is further provided a computer program product, which is tangibly stored on a non-transitory computer-readable medium and includes computer-executable instructions, where the computer-executable

instructions are executed by a processor to implement the method described above.

[0104] Various aspects of the disclosure are described herein with reference to the flowcharts and/or block diagrams of the methods, apparatuses, devices, and computer program products implemented according to the disclosure. It would be appreciated that each block of the flowchart and/or block diagram, and each combination of blocks in the flowchart and/or block diagram may be implemented by computer-readable program instructions.

[0105] These computer-readable program instructions may be provided to a processor 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 processor of the computer or other programmable data processing apparatus, an apparatus for implementing the functions/actions specified in one or more blocks of the flowchart and/or block diagram is produced. These computer-readable program instructions may also be stored in a computer-readable storage medium, which instructs the computer, the programmable data processing apparatus, and/or other devices to work in a specific manner. Thus, the computer-readable medium having the instructions stored therein includes a manufactured product, which includes instructions for implementing various aspects of the functions/actions specified in one or more blocks of the flowchart and/or block diagram.

[0106] The computer-readable program instructions may be loaded onto a computer, other programmable data processing apparatus, or other devices to perform a series of operations and steps on the computer, other programmable data processing apparatus, or other devices to produce 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 flowchart and/or block diagram.

[0107] The flowchart and block diagram in the drawings show the possibly implemented architectures, functions, and operations of the system, method, and computer program product according to multiple implementations of the 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 noted that each block of the block diagram and/or flowchart, and each combination of blocks in the block diagram and/or flowchart may be implemented by a special-purpose hardware-based system that perform the specified functions or

actions, or may be implemented by a combination of special-purpose hardware and computer instructions.

[0108] The implementations of the disclosure have been described above. The above description is illustrative, non-exhaustive, and not limited to the disclosed implementations. Without departing from the scope and spirit of the illustrated implementations, many modifications and changes would be apparent to those of ordinary skill in the art. The terms used herein are chosen to best explain the principles, practical applications, or improvements to the technology in the market of each implementation, or to enable other those of ordinary skill in the art to understand the implementations disclosed herein.

CLAIMS

1. A method for information interaction, comprising:
 - in response to providing media content and an associated recommendation object to a user, receiving or requesting to determine, based at least on user attribute information of the user, at least one visual style for the recommendation object from a plurality of visual styles and a presentation strategy for the at least one visual style; and
 - presenting, in accordance with the presentation strategy, recommendation content related to the recommendation object in the at least one visual style during a presentation of the media content.
2. The method of claim 1, wherein the plurality of visual styles respectively indicates different recommendation content and/or different appearance styles of recommendation content related to the recommendation object.
3. The method of claim 1, wherein the presentation strategy indicates at least one of:
 - a presentation timing of each visual style, or
 - a presentation order of two or more visual styles in a case where two or more visual styles are determined for the recommendation object.
4. The method of claim 1, wherein receiving or requesting to determine the at least one visual style for the recommendation object and the presentation strategy based at least on the user attribute information of the user comprises:
 - receiving or requesting to determine an association degree between the user and the recommendation object based at least on the user attribute information of the user; and
 - receiving or requesting to determine the at least one visual style for the recommendation object and the presentation strategy based on the determined association degree.
5. The method of claim 4, wherein receiving or requesting to determine the association degree between the user and the recommendation object comprises:
 - receiving or requesting to determine the association degree between the user and the recommendation object based on the user attribute information of the user and object attribute information of the recommendation object.

6. The method of claim 4, wherein determining the at least one visual style for the recommendation object and the presentation strategy comprises:

determining at least a first visual style and/or a first presentation strategy in response to the association degree falling within a first association degree range; and

determining at least a second visual style and/or a second presentation strategy in response to the association degree falling within a second association degree range, a value range of the second association degree range being greater than a value range of the first association degree range, and

wherein recommendation content indicated by the second visual style comprises recommendation content indicated by the first visual style and additional recommendation content, and/or an appearance style of at least part of the recommendation content indicated by the second visual style is presented more prominently than an appearance style of at least part of the recommendation content indicated by the first visual style, and/or

wherein a presentation timing of the second visual style in the second presentation strategy is earlier than a presentation timing of the first visual style in the first presentation strategy.

7. The method of claim 6, wherein the additional recommendation content comprises at least prompt information corresponding to a virtual resource associated with the recommendation object.

8. The method of claim 1, further comprising:

presenting, in association with the recommendation content, prompt information corresponding to a virtual resource during the presentation of the media content, in response to determining that the user satisfies a requirement for obtaining the virtual resource.

9. The method of claim 8, wherein presenting the prompt information comprises:

in response to determining that the user satisfies the requirement for obtaining a plurality of types of virtual resources, determining a target type of virtual resource from the plurality of types of virtual resources based on at least one of the user attribute information of the user and object attribute information of the recommendation object; and

presenting, in association with the recommendation content, prompt information corresponding to the target type of virtual resource during the presentation of the media content.

10. The method of claim 1, wherein the recommendation content indicated by one or more

of the plurality of visual styles comprises at least: an access entry for the recommendation object, and/or a virtual resource to be consumed to obtain the recommendation object.

11. An apparatus for information interaction, comprising:

a determining module configured to, in response to providing media content and an associated recommendation object to a user, receive or request to determine, based at least on user attribute information of the user, at least one visual style for the recommendation object from a plurality of visual styles and a presentation strategy for the at least one visual style; and

a content presenting module configured to present, in accordance with the presentation strategy, recommendation content related to the recommendation object in the at least one visual style during a presentation of the media content.

12. An electronic device, comprising:

at least one processor; and

at least one memory, the at least one memory is coupled to the at least one processor and stores instructions executable by the at least one processor, the instructions, when executed by the at least one processor, causes the device to perform the method of any of claims 1 to 10.

13. A computer-readable storage medium having computer-executable instructions stored thereon, the computer-executable instructions, when executed by a processor, implement the method of any of claims 1 to 10.

14. 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, cause the device to perform the method of any of claims 1 to 10.