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SYSTEMS AND METHODS FOR DELIVERING A CONTENT ITEM TO A USER

Paid subscriptions are an important business model for many content delivery platforms. Typically, such services are free for unsubscribed users, but generate additional revenue from the unsubscribed users through the delivery of supplemental content items to those users. For many such services, the revenue associated with a typical subscribed user exceeds that associated with a user who generates revenue merely by viewing supplemental content items. As a result, converting users from free services to paid subscription services can help to increase total revenue. One way to encourage a user to purchase a subscription is to give the user a free trial. The user will see the benefits of the product or service during the free trial, and may subsequently decide to purchase a subscription. It can be useful to remind the user to subscribe to the service immediately following the end of the free trial. Over time, the user may become accustomed to viewing supplemental content items again and may therefore be less likely to subscribe as time passes following the end of the free trial period. Thus, it may be desirable to adjust timing for delivery of supplemental content items related to subscription to the service.

The timing for delivery of supplemental content items can be important in other contexts as well. For example, if a user searches for a topic using a search engine, it can be useful to show the user a supplemental content item relevant to the topic soon after the search, rather than later when the user may be thinking about a different topic. Traditionally, this issue has been addressed by applying a time limit to delivery of supplemental content items related to Internet searches. These time limits can be large, and users may perform searches related to many different topics in short periods of time while browsing content online. If the user sees many content items, the delivery of a newly relevant content item may be separated from the search by several other content items that are not relevant to the search. If the user sees the content item

relevant to the recent search shortly after the search, but also has seen dozens of unrelated content items in between, the relevant content item may be significantly less effective. For example, the user's mind may have strayed from the topic of the original search. Thus it can be useful for the relevant content item to be delivered to the user as one of the content items following the event (e.g., the search) to which the content item is relevant. This is particularly the case with content items that are displayed to a user prior to a video that the user has selected. This paper describes techniques for addressing these issues by making content items much more likely to be delivered as one of the first impressions following the occurrence of some event. As discussed above, in some implementations, the event may be the end of a free trial to a paid subscription service. In some other implementations, the event may be a search query.

Shown below in FIG. 1 is a system for delivering content to a user. The system includes a content provider 115 that communicates with a computing device 120 via a network 105. The network 105 includes a content delivery system 110, which can be configured to deliver content items to the computing device 120 based on the number of content items that have been displayed on the computing device 120 since the occurrence of a specified event.
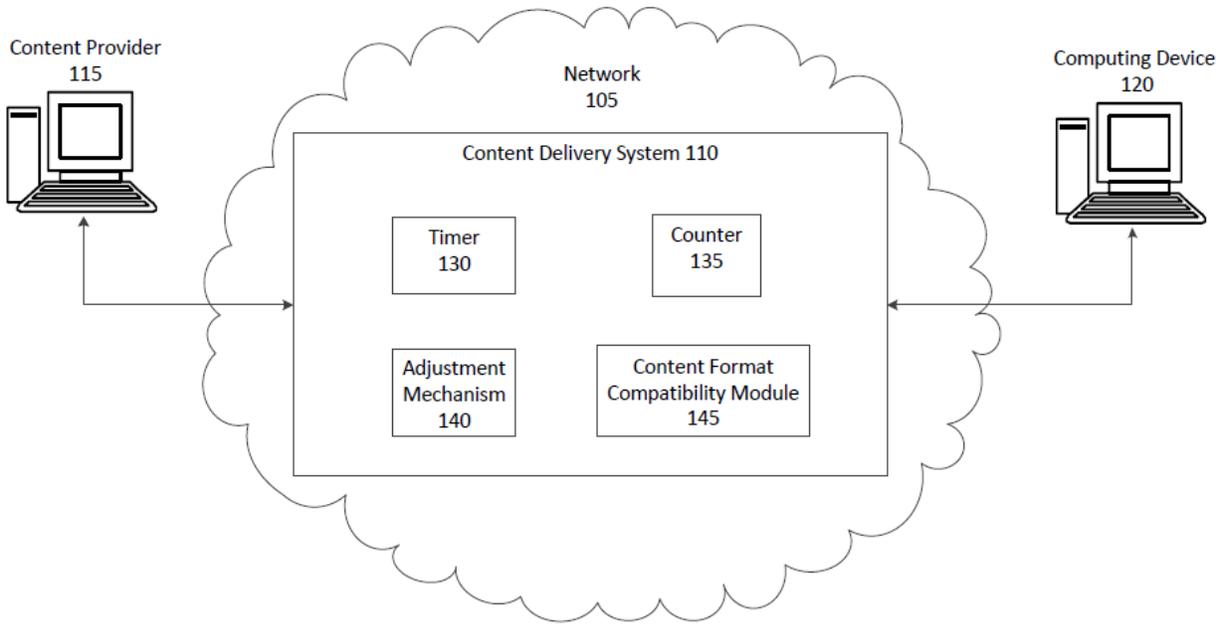
FIG. 1

In some implementations, the content provider 115 can include a server or computing device configured to provide content items, such as videos or images, for delivery via the network 105 to the computing device 120. The content delivery system 110 can detect a request for content from the computing device 120, and can respond by delivering a content item for display at the computing device 120. In some implementations, the content delivery system 110 can receive information, such a search query, from the computing device 120. For example, a user of the computing device 120 can use the computing device 120 to retrieve information from the network 105, which in some implementations can be the Internet. Supplemental content items provided by the content provider 115 also can be delivered to the computing device 120 for display to the user.

As described further below, after the occurrence of a specified event, the content delivery system 110 can deliver a content item to the computing device 120 based in part on a number of content delivery opportunities that have occurred, rather than based merely on a total time that

has elapsed since the occurrence of the event. In some implementations, the system of Figure 1 can be particularly useful for delivering content items relating to paid subscription upgrades following the end of a free trial period. In some other implementations, the system of Figure 1 can be used to deliver content items following a specific search query.

In some implementations, the content delivery system 110 may store information relating to the computing device 120. For example, the content delivery system 110 may store information corresponding to recent search queries originating from the computing device 120 or information relating to free trial subscriptions associated with the computing device 120. The content delivery system 110 includes a timer 130, a counter 135, an adjustment mechanism 140, and a content format compatibility module 145, each of which can generate information that may facilitate the delivery of content items to the computing device 120. In some implementations, the content delivery system 110 can identify an opportunity to deliver a content item to the computing device 120, and can use the information provided by the timer 130, the counter 135, the adjustment mechanism 140, and the content format compatibility module 145 to select an appropriate content item to be delivered.

In some implementations, the timer 130 can be configured to track an amount of time that has elapsed since the occurrence of a specified event. As discussed above, the event can be the end of a free trial period for a service used by the computing device 120. In some other implementations, the event can be a search query originating from the computing device 120. In some implementations, the timer 130 also may keep track of a time threshold, and may determine when the time elapsed after the event has exceeded the time threshold. Similarly, the counter 135 can be configured to track a total number of content items that have been delivered to the computing device 120 since the occurrence of the event, and may determine when the total

number of content items delivered to the computing device 120 exceeds a predetermined threshold.

During a content item selection process, the content delivery system 110 can determine whether there is an opportunity to deliver a particular content item provided by the content provider 115. In some implementations, this determination can be made based in part on information generated by the content format compatibility module 145. For example, if a user of the computing device 120 has attempted to access video content, the content format compatibility mechanism 145 can determine that a content item is compatible with this opportunity if the content item is a pre-roll video content item. Otherwise, the content format compatibility mechanism 145 can determine that the content item is not compatible. The content delivery system 110 also can use other information to determine whether there is an opportunity to deliver a particular content item to the computing device 120. For example, information generated by the timer 130 and the counter 135 can be relevant to the determination. In some implementations, the content delivery system 110 can determine whether the opportunity for delivering a particular content item occurs after the specified event (i.e., the timer 130 has a value greater than zero) but before the expiration of the timer (i.e., the timer 130 has a value below the predetermined time threshold). Similarly, the content delivery system 110 also can determine whether the opportunity for delivering a particular content item occurs before the delivery of a predetermined number of content items (i.e., the counter 135 has a value less than the predetermined threshold).

In some implementations, once it has been determined that the content item is suitable for delivery to the computing device 120, the content item can be added to an auction along with other content items, and content publishers (including the content publisher 115) can submit bids

for having their respective content items delivered. In some implementations, the content item is always included in the auction, but some component of its auction bid, such as a quality score, may be adjusted to account for the conditions being met as described above. For example, the adjustment mechanism 140 can adjust the quality score of the content item based on the information received from the timer 130, the counter 135, and the content format compatibility module 145. In one implementation, a quality score or weight may be inversely proportional to a value of counter 135 or a difference between a value of counter 135 and a threshold. For example, a quality score may be decreased with each increment of the counter 135 until reaching a threshold, at which point the content item may be removed from the auction as discussed above. This may not affect the bid submitted by the content publisher 115, but may still have a direct result on the likelihood that the bid submitted by the content publisher 115 wins the auction.

It should be understood that the examples described above are illustrative only, and the principles illustrated by those examples may apply to other situations. For example, a subscriptions can expire after a user's credit card stops processing automated payments. This is often unexpected by the user, and the principles described above may be used in such a circumstance to re-engage the user whose subscription status is lapsing, for example by treating the expiration of the user's credit card as the specified event.

ABSTRACT

We propose techniques for delivering a relevant content item to a user. These techniques may render the relevant content item more likely to be delivered as one of the first impressions following the occurrence of a specified event. In some implementations, the event may be the expiration of the user's free trial period for a subscription service. In some other implementations, the event may be a search query entered by the user. The techniques discussed in this paper may track the number of other content items delivered to a user since the occurrence of the event, and may use this information as the basis for selecting a time at which to deliver the relevant content item to the user.