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Attribute-based and Vertical-based Real-Time Bidding

BACKGROUND

Accurate advertisement targeting enables advertisers to more effectively notify customers of its products and spread brand awareness -- as well as provide more relevant advertisements to users to improve their online experience. Utilizing an advertising system manager that connects advertisers with users, advertisers can set targeting criteria including demographic information as well as publisher vertical information. This ensures that an appropriate group of users are provided advertisements in the appropriate context. However, utilizing such targeting criteria does not enable user-level or more aggressive interest-based targeting, and further hinders remarketing.

In some cases, real-time bidding (RTB) is utilized for targeted advertising. In RTB, the advertising system manager requests a real-time bid from advertisers (or their agents) at the time of the opportunity to present an advertisement. The advertising system, in response, can provide publisher information, including a site vertical. In some cases, the advertising system may provide an IP address and/or cookie information (ID) of the user. The cookie (or ID) is associated with the advertiser's sites (or sites for the agent or data-management platform). The advertiser uses this ID to determine the user's activity on its sites -- including such information as how often the user visits their site and purchases products. In some cases, this information is utilized by the advertiser in determining how much to bid on an impression, or whether to bid at all.

However, utilizing RTB, including sending the ID to the advertiser (e.g., utilizing a separate ID-matching procedure that matches advertising system manager IDs to the third-party IDS), can include several issues. For example, it can be difficult for the advertisers to respond quickly and accurately -- with tens of millions of users, it is difficult for the advertiser to make accurate user-level bids based on IDs in the time allotted for a response.
Further, there is the potential for privacy leaks. For example, the advertiser can be provided
the site name, vertical, and IP address information -- if a cookie is also provided, the advertiser
can determine that these values are associated with the cookie, and the advertiser will know a site
that the user has visited. The advertiser could potentially utilize such information inappropriately,
advertise more directly without utilizing the advertising system manager, or even sell the
information. The privacy leak risks are similar to those for third-party pixels, where advertisers
and data management platforms use a pixel in ads to set and read cookies on user’s browsers. To
that end, knowing the targeting criteria of an advertising campaign can provide information to the
advertisers about the user behind the cookie.

Similar problems arise with RTB if demographic information is exposed. For example,
advertisers often give pre-targeting information to filter out users – the advertising system manager
then knows that bid requests that they receive satisfy these filters. The advertising system manager
may need to be selective in which pre-targeting criteria are allowed, but some sensitive information
such as mobile device type and mobile carrier is often available.

DESCRIPTION OF DRAWINGS

Figures 1 and 2 are diagrams of an example system for a real-time bidding auction.

DETAILED DESCRIPTION

This document describes a process of providing more generic yet more useful data to
advertisers in the real-time bidding protocol. For example, cookies (or IDs) are not provided by
the advertising system manager to the advertisers. As a result, advertisers do not have to process
user-level data, and privacy risks are greatly mitigated. Instead, the advertising system manager
provides demographic information and vertical information directly. Advertisers can quickly and
generically process the fields about which they care and make a quick response with an accurate
bid. The demographic information cannot be tied back to a user without an ID.

In some cases, advertisers can provide the advertising system manager user-level scores
associated with IDs. The advertising system manager, instead of providing IDs, can provide
bucketed scores. This allows advertisers to use information such as site visits in the scores, thus
maintaining abilities for interest-based targeting and remarketing. In some cases, scores can be
multi-dimensional. Further, utilizing bucketed scores genericizes the user information and better
protects the privacy of the user. Using this approach instead of IDs allows the advertising system
manager to provide user-specific information that the advertiser has gathered themselves while
also providing demographic and vertical information in a privacy-safe way – providing the
advertiser with useful information to make an informed bid.

In some cases, this provides the ability for advertisers to target advertisements against
privacy-sensitive queries that would otherwise be untargetable. For example, advertisers can run
queries against data that joins edges between multiple accounts or social networks and flag those
users without the advertiser discovering what those edges are. Thus, advertisers can real-time bid
against these user flags, taking into account other data such as the page the advertisement is
displayed on.

Fig. 1 illustrates an example system 100 for real-time bidding (RTB). The system 100
includes an advertising system manager 102, advertising systems 104a, 104b, 104c (collectively
referred to as advertising systems 104), and a client computing device 106. The advertising system
manager 102 is in communication with the advertising systems 104 and the client computing
device 106 over one or more networks.
The client computing device 106 provides a request 120 to the advertising system manager 102, at step A. The request 120 can include a request for advertising content to be displayed on an electronic document provided to the client computing device 106, *e.g.*, from a third party content provider. The advertising system manager 102 receives the request 120, and in response, initiates a real-time bidding (RTB) auction for providing advertising content to the client computing device 106, at step B. When a real-time bid is requested, the advertising system manager 102 provides auction data 130 to the advertising systems 104, at step C. In some cases, the advertising system manager 102 provides within the auction data 130 user demographic information and publisher vertical information (*e.g.*, type of site, or the site itself).
The advertising systems 104 receive the auction data 130, and generate bids 140 based on the auction data 130, at step D. By generating the bids 140 based on the auction data 130 (that includes demographic information and publisher information), the advertising systems 104 can process much more quickly (as this data is “generic”). Further, the advertising systems 104 are able to maintain advertising strategy private (e.g., from the advertising system manager 102) as the advertising systems 104 may not want to expose what demographic information or verticals are of importance when generating the bids 140.

In some cases, the auction data 130 can include twenty or more fields of demographic information. In some cases, the advertising system manager 102 can provide k-anonymity of the auction data 130. That is, the advertising system manager 102 utilizes at least k-users (e.g., k=50) that the advertising systems 104 could bid on that have a specific set of characteristics that the advertiser systems 104 might see in a RTB request (where the k-users appear to look the same from the point of view of the advertising systems 104).

In some cases, the advertising systems 104 can provide the advertising system manager 140 with a score (multi-dimensional) for the user associated with the request 120. The score can indicate how often the user visits the advertiser’s site or purchases products on it. The advertising system manager 140 can bucketize the score to preserve k-anonymity and provide such to the advertising systems 104 in the auction data 130. An example of such is Boolean flags. The advertising systems 104 can set (or not set) flags (e.g., ten flags), and the advertising system manager 102 can provide this to the advertising systems 104 (e.g., included in the auction data 130). This would protect the bidding strategy of the advertising systems 104, and provide the advertising systems 104 user-specific information in a k-anonymous way.
Referring to Fig. 2, the advertising systems 104 provide the bids 140 to the advertising system manager 102, at step E. The advertising system manager 102 selects a winning bid 150 of the auction based on the bids 140, at step F. The advertising system manager 102 then provides an advertisement 160 based on the winning bid 150 to the client computing device 106, at step G.
ABSTRACT

This document describes real-time bidding protocol where cookies or IDs are not provided by an advertising system manager to the advertisers. Rather, the advertising system manager provides demographic information and vertical information directly to the advertising systems. The advertising systems can then use this data to place bids in the real-time bidding auction.