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# SPONSORED NEXT STEPS IN SEARCH ENGINE

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# SPONSORED NEXT STEPS IN SEARCH ENGINE

Search engines can retrieve search results from their respective database by relying on search queries from client devices. Depending on the search query, the search engine can retrieve different links to information resources and content items for presentation on a search result page. The information resources and content items can include, for example, webpages, applications, images, videos, and other resources indexed within the database of the respective search engine.

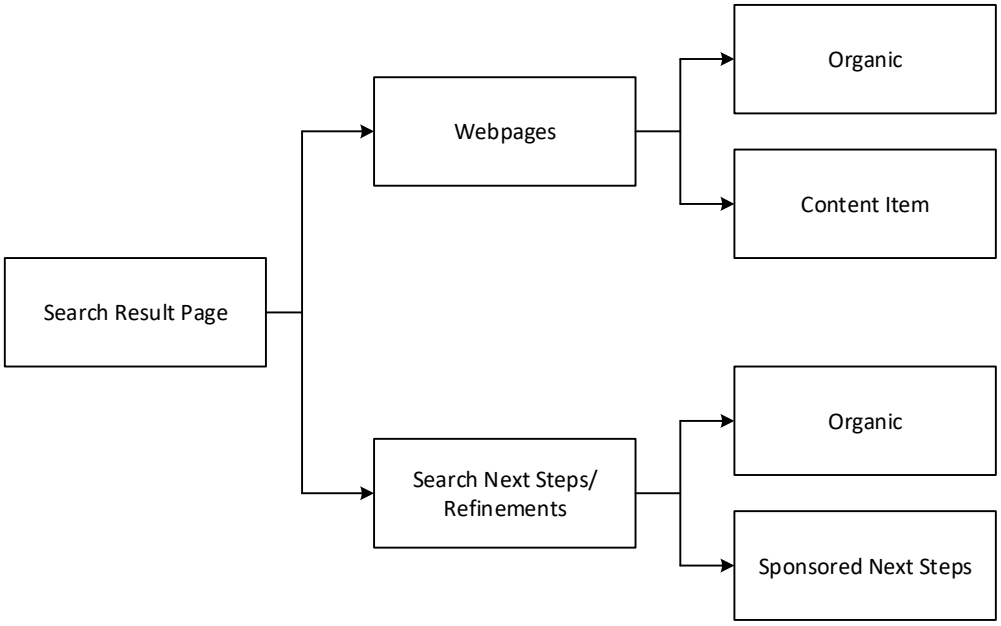
The search engine can monetize from content providers via interactions from client devices. For instance, the search engine can identify a commercial intent from the search query and select relevant products and services from content providers to display as content items in a search result page. The client device can interact (e.g., click on, hover the cursor over, view, or scroll pass) with a content item from a content provider, which redirect the client device to display a webpage of the content provider. The search engine can monetize this interaction indicated by the client device.

However, for these search engines, commercial intent is elicited by interpreting search queries received from the client device. The content items are unbiased and algorithmically selected based on collective search patterns historically provided by the client device. Hence, these search engines do not account for the monetization of the search engines and the content providers when selecting or ranking the searches or next steps suggestions for the client device.

To alleviate the above deficiencies, a data processing system can construct a journey for a client device by suggesting the “next step” to optimize client experiences, return on investment for content providers, and monetization of a search engine. The data

processing system can include one or more processors interconnected to at least one memory and can be associated with a search engine.

A flow diagram illustrating an example navigation path for search engine refinement is provided and discussed below:




The navigation path for search engine refinement can begin with a client device landing on a search result page. The result page can include links or contents associated with hyperlinks for navigating to other webpages, for example. In the first path of the flow diagram, the user of the client device can select a link a content to navigate to one or

more webpages. Subsequently, the web browser can redirect the client device to a webpage of the one or more webpages, which can include organic contents (i.e., original content of a respective webpage) or content item from a content provider. In some cases, each website can include content items from content providers that are affiliated with the website, have contents similar to that of the website, or based on their ratings. In such cases, some other content providers can be excluded from the website.

To optimize client experiences, return on investment for content providers, and monetization of a search engine, the second path can be used by the client device. Within the search result page can include a search next steps/refinements interface. The interface can include organic search queries or sponsored next steps. The organic search queries can be suggested by the search engine based on client device search history, cookie, or other device information.

The sponsored next steps, e.g., search queries, refinement queries, or sponsored refinements) can also be presented to the client device based on at least the client device information (e.g., search history and cookie data) and objectives of content providers. By utilizing search engine refinement, the client's search journey can be enhanced and return on investment for content providers (i.e., content publisher), as well as monetization for the search engine, can be optimize. The aforementioned organic search queries can be referred to as unbiased search queries, whereas the sponsored next steps can be referred to as biased search queries.

As an example, the search engine can receive a first search query including keywords, sentences, or other texts associated with an objective or a commercial intent. After receiving the query, the search engine can generate additional search queries that

are associated with the first search query, e.g., related to the search query received from the client device. These additional search queries can be referred to as, for example, sponsored queries, content items, refinement queries, next steps queries, or suggested queries. The refinement queries can be generated based on at least the query patterns received from client devices and configured to optimize for monetization of the content providers and the search engine.

In some cases, the data processing system can retrieve the refinement queries from the memory or a database of a server. The refinement queries can elicit the client task at hand, improve client search experiences, and optimize the monetization of the search engine and content providers by suggesting one or more next steps for the client device to take. Each of the refinement queries can be associated with a statistical conversion rate (i.e., interaction rate) which can indicate corresponding historical interactions by one or more client devices. The search engine can use the conversion rate (e.g., indicating likelihood of interactions by the user) to determine which refinement queries should be included within the refinement interface and their ranking/order.

In some cases, the generated next steps can be provided by content providers. For example, content providers can determine groups of client devices to target, based on their search queries or behavior. Accordingly, the content providers can generate the raw next steps or search queries and transmit the generated search queries to the data processing system.

The historical interactions can include a record of interactions with content items by one or more client devices (e.g., number of times client devices interact with a link). The historical interactions can be a ratio, a percentage of click-through-rate, among

others for recording a total number of interactions relative to a total number of views (e.g., content items displayed on the client device).

The conversion rate of a refinement query can be based on client device interactions with links or content items associated with the refinement queries. For example, the search engine can receive a search query “tennis” from the client device. Subsequently, within the result page, the search engine can increase the conversion rate of links or content items the user interacts with, such as links to “tennis shoes” or “tennis bag”. The increase in conversion rate can be reflected to the refinement query. For example, referring to the previous example, the search engine can include refinement queries related to “tennis” search query, e.g., “tennis shoes” or “tennis bag” based on the conversion rate. Hence, the search engine can optimize return on investment of content providers and monetization of the search engine.

In some cases, the conversion rate can increase when the search engine receives additional search query similar to a refinement query. Increasing the conversion rate corresponding to a refinement query can be reflected as decreasing the conversion rates for other refinement queries. In other cases, receiving additional search queries different from (e.g., not similar to) any of the refinement queries can decrease the conversion rate for the refinement queries.

The search engine can select a subset of refinement queries from a pool of refinement queries. The subset can be selected based on their conversion rate satisfying or greater than a threshold (e.g., a selection threshold, a conversion rate threshold, or other similar descriptive terms). The threshold can be predetermined, such as 40%, 50%, 60%, or other conversion rates. In other cases, the search engine can dynamically adjust,

modify, or determine a threshold value or percentage based on the time, a traffic level, or historical data of the client device.

The search engine can select a subset of the refinement queries based on an objective of content providers. The subset can be selected using both the statistical conversion rate and the objective. The objective can be content providers targeting search queries with commercial intent. For example, using the aforementioned example, if the client device provide “tennis” as the search query, the search engine can provide a refinement query from a first content provider with “tennis shoes” and a second provider with “tennis bag” as the objectives. Based on the conversion rate, the search engine can rank the queries accordingly.

The ranking of the subset of refinement queries can be based on an overall monetization value of each refinement query within the subset. The overall monetization, for example, can be based on a click-through-rate of a respective refinement query multiplied by a long term value of one or more content items included with the refinement query associated with at least one content provider. The long term values may be referred to as a monetizable unit value one the client device selects the refinement search. The monetizable unit value of the one or more content items can be based on the traffic of client devices viewing the content items and return on investment or revenue for the content provider. In some cases, the ranking of the refinement queries can be based on a bid value provided by a respective content provider.

Once the client device provide an indication of interaction with a refinement query, the search engine can redirect the client device to a second result/landing page associated with the refinement query. Therein, the second landing page can include an

interface having refinement queries (e.g., with similar or different refinement queries than the previous result page).

The number of refinement queries displayed on a display device of the client device can be based on the screen size, aspect ratio, or search engine configuration. Within the interface displaying the refinement queries, interactive elements can be provided including feedback feature as a text, icon, or hyperlink.

## Abstract

Search engines can be accessed by client devices to improve search experiences, return on investment for content providers, and monetization of the search engine. A data processing system can construct a journey for a client device by suggesting subsequent steps for the client device to follow. The data processing system can generate search queries associated with a search query input by the client device, where each search query can include a statistical conversion rate. A subset of the search queries can be selected based on their statistical conversion rate. Consequently, the data processing system can transmit a search result including the subset of search queries for display on the client device.