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Shopping Expedition Planner

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SHOPPING EXPEDITION PLANNER

ABSTRACT

A shopping system generates a shopping route based on a wish list of a user, shopping route preferences, and location information received from a plurality of merchant systems, and inventory information. The shopping system determines one or more offers associated with the shopping route and combines the offers with the shopping route.

BACKGROUND

Consumers often have wish lists of items to buy and may prefer to buy those items from brick-and-mortar stores instead of via online ordering. Current applications do not optimize shopping routes for consumers that take into consideration every detail of a consumer's shopping route.

OVERVIEW

The examples described herein provide computer-implemented techniques to generate a shopping route for a consumer.

A shopping system receives location information, inventory information, and hours of operation information from multiple merchant systems in addition to a wish list of a user, a location of the mobile device of the user, and the shopping route preferences from a mobile device. The shopping system generates a shopping route based on the wish list of the user, the shopping route preferences, and the location information, the hours of operation information, and the inventory information received from the plurality of merchant systems. The shopping system determines one or more offers associated with the shopping route to combine with the shopping route. The shopping system transmits the shopping route to the mobile device. The user arrives at a particular merchant system location along the shopping

route and the shopping application presents an offer associated with the particular merchant system location to the user via the mobile device. The shopping system periodically updates the shopping route as the user completes the shopping route or based on new conditions.

EXAMPLE PROCESSES AND ARCHITECTURE

With reference to Figure 1, a shopping system will be described.

In an example, a shopping system 130 receives location information, inventory information, and hours of operation information from a plurality of merchant systems 160 over a network 120. In an example, location information comprises an address and/or coordinates determined by a global positioning system ("GPS") component 113 of a mobile device 110. Inventory information may comprise, from each of the multiple merchant systems 160, a quantity, a description, and a price associated with each of the one or more items offered for sale by each respective merchant system 160. The shopping system 130 may keep a log comprising the location information, inventory information, and hours of operation information and may periodically receive updated location information, updated inventory information, and updated hours of operation information from each of the multiple merchant systems 160. For example, the shopping system 130 receives, from each of multiple merchant systems 160 over a network 120, information comprising location information, inventory information, and/or hours of operation information. The shopping system 130 may periodically, for example every day, receive one or more of updated inventory information, updated hours of operation, and/or updated location information from one or more of the multiple merchant systems 160.

In an example, a user 101 associated with a mobile device 110 accesses a website 131 of the shopping system 130 and downloads a shopping application 115 on the mobile device 110 of the user 101. For example, the user 101 accesses the website 131 via a web browser

117 of the mobile device 110 of the user 101 and selects an option on the website 131 to download a shopping application 115 onto the mobile device 110 of the user 101. The shopping application 115 on the mobile device 110 is able to communicate over the network 120 with the shopping system 130. The shopping application 115 may be configured by the user 101 to send location data logged by the GPS component 113 of the mobile device 110 to the shopping system 130 over the network 120 to aid in generating shopping routes and/or updating existing shopping routes.

The user 101 creates a wish list by selecting one or more items or categories using the shopping application 115. In an example embodiment, the shopping system 130 generates an item directory based on inventory data received from the multiple merchant systems 160 and transmits the item directory to the mobile device 110 for display to the user 101. The user may access item directory via the shopping application 115 on the mobile device and may browse the item directory by selecting one or more objects on the user interface 111 of the mobile device 110. In an example, the user 101 may add one or more items listed in the item directory to a wish list. The user 101 may select a particular item from the item directory and input a quantity of the selected item that the user 101 desires to purchase. The user 101 may remove particular items or edit the quantity of particular items in the wish list by selecting one or more objects on the user interface 111 of the mobile device 110. In an example, the user 101 manually inputs an item for addition to the wishlist and the user 101 is shown a sample of matching items from the item directory, and can then modify (e.g. changing dolly to doll) or refine their input. The user 101 may request a shopping route for the items in the wish list. For example, the user 101 selects an object on the user interface 111 displayed in the shopping application 115 that reads "generate shopping route." The shopping application 115 transmits wish list data comprising the selection of the one or more items the user 101

desires to purchase over the network 120 to the shopping system 130. The shopping system 130 receives the wish list data over the network 120.

The user 101, in addition to selecting one or more items the user 101 desires to purchase, may select one or more shopping route preferences via the shopping application 115. For example, the user 101 may select a preference for a shorter overall shopping route, a shopping route that avoids major highways, a shopping route that prioritizes or avoids particular merchant systems, a shopping route that prioritizes ease of parking, and/or other shopping route preferences. In another example, the user 101 may select a preference to start the shopping route immediately or may set a time to start the shopping route. In an example, the shopping application 115 transmits, over the network 120 and to the shopping system 130, the selected one or more shopping route preferences along with the wish list data comprising the one or more selected items for purchase.

The shopping system 130 receives the wish list of the user 101, a location of the mobile device 110 of the user 101, and the shopping route preferences from the mobile device 110. The user 101 may configure one or more settings on the shopping application 115 to allow the shopping system 130 to receive location data logged by the mobile device 110 of the user 101. For example, the shopping system 130 is able to log the location of the mobile device 110 as long as the user 101 is logged into the shopping application 115 and if the user 101 configured the settings of the shopping application to allow the shopping system 130 to receive location data logged by the GPS component 113 of the mobile device 110.

The shopping system 130 generates a shopping route based on the wish list of the user 101, the shopping route preferences, and the location information received from the plurality of merchant systems 160, the hours of operation information received from the plurality of merchant systems 150, and the inventory information received from the plurality of merchant systems 1560. In an example, the shopping system 130 may further determine the shopping

route based on traffic information received from a traffic information system 140, parking information received from a parking information system 140, and one or more offers received from one or more offer systems 170. In an example, the shopping system 130 generates multiple candidate shopping routes based on the wish list of the user 101 and the location, hours of operation, and inventory information received from the multiple merchant systems 160. This shopping system 130 may use constrained optimization techniques to build a set of optimal candidate itineraries. For instance, comparing prices across these different stores, using distances from the user's 101 current location or home to compute the total travel time to visit all the merchant system 160 locations selected, and so on. The shopping system 130 may also use machine learning to incorporate user preferences for certain brands or malls based on past shopping routes of the user 101 or learning how to trade off item cost versus travel time based on similar shopping routes generated for other users 101.

In an example, the shopping system 130 may then select a particular generated candidate shopping route to optimize the shopping route in accordance with the one or more shopping route preferences selected by the user 101. For example, the shopping system 130 may select the candidate shopping route that results in the least total shopping time in accordance with a user 101 preference for a short-duration shopping route. In another example, the shopping system 130 may select the candidate shopping route that results in the least distance travelled in accordance with a user 101 preference for a short-distance shopping route. In yet another example, the shopping system 130 selects a candidate shopping route that avoids certain highways based on a user 101 preference to avoid certain highways. In another example, the shopping system 130 selects a candidate shopping route that prioritizes or avoids particular merchant systems 160 based on a user 101 preference to prioritize or avoid one or more particular merchant systems 160. In some examples, the shopping system 130 may select a candidate shopping route based on two or more shopping

route preferences selected by the user 101. For example, the shopping system 130 selects a candidate shopping route comprising the shortest duration shopping route of all candidate shopping routes that avoid certain highways in accordance with the user's 101 selected shopping route preference to avoid certain highways and preference for a short-duration shopping route. In another example, the shopping system 160 may display several candidate shopping routes and the user 101 can then compare these itineraries based on which wishlist items are covered and how much inventory/variety is estimated to be available, total travel times, or estimated prices. The user 101 may further refine their inputs to edit the wishlist, modify shopping route preferences, or specify a time or date for beginning the shopping route to get a new set of candidate itineraries and then select a particular candidate shopping route.

The shopping system 130 determines one or more offers associated with the shopping route and combines the offers with the shopping route. In an example, the shopping system 130 determines offers associated with one or more items in the shopping route and/or one or more merchant systems 160 in the shopping route. Offers may be usable for any item offered by a particular merchant system, may be usable for a particular item offered by any merchant system 160, or may be usable for a particular item offered by a particular merchant system 160. In an example, an offer may be associated with a particular merchant system 160 location. The shopping system 130 may organize the offers and configure the offers to be displayed at appropriate times or locations along the shopping route.

The shopping system 130 transmits the shopping route comprising the one or more offers to the mobile device 110 of the user 101. The mobile device 110 receives the shopping route comprising the one or more offers via the network 120. In an example, the shopping route is configured to begin immediately upon receipt by the mobile device 110. In another example, the shopping route is configured to being at a time previously requested by the user 101. The user 101 may review the received shopping route and if the user is not satisfied

with the shopping route, the user 101 may request a new shopping route by actuating one or more objects via the user interface 111 displayed by the shopping application 115. For example, the user 101 may modify one or more shopping route preferences or may add, edit, or delete one or more items from the user's 101 wish list to provide a basis from which the shopping system 130 may modify the shopping route. In an example, the shopping route comprises directions and/or a map display to be displayed via the user interface 111 of the mobile device 110 that indicates to the user 101 the shopping route. The shopping route may indicate via the map display the user's 101 current location on the map display as the user 101 travels along the shopping route and highlight the shopping route on the map display.

The user 101 begins completing the shopping route. In an example embodiment, the shopping system 130 periodically receives an updated location logged by the mobile device as the user completes the shopping route. The shopping system 130 may transmit alerts comprising offers, parking instructions, or other relevant alerts to the mobile device based on the updated location of the mobile device. The shopping system 130 may also make one or more changes to the shopping route based on the updated location information received from the mobile device 110. For example, the shopping system 130 may periodically receive updated traffic information from the traffic information system 140 indicating a traffic jam between the current location of the mobile device 110 and the next location in the shopping route and may provide the user 101 with an alternative shopping route or may recalculate the entire shopping route to accommodate for the change in traffic information. In another example, the a particular merchant system 160 location along the shopping route closes based on the hours of operation data associated with the particular merchant system 160 and the shopping system 130 eliminates the particular merchant system 160 location from the shopping route or otherwise calculates a new shopping route for the user 101 that does not require the user 101 to visit the merchant system 160 location that has closed. In yet another

example, during the shopping route, the user 101 may add, edit, or delete one or more items from the wish list and the shopping system 130 may recalculate or otherwise edit the shopping route based on the changes to the wish list.

The user 101 arrives at a particular merchant system 160 location along the shopping route and the shopping application 115 presents an offer associated with the particular merchant system 160 location to the user via a user interface 111 of the mobile device 110. The shopping application 115 may also present, via the user interface 111 of the mobile device 110, parking directions as the user 101 arrives at a particular merchant system 160 location. In another example, the shopping application 115 does not present offers to the user 101 but instead notifies the user 101, at each merchant system 160 location along the shopping route, of one or more offers that may be used at each respective merchant system 160 location. In this example, the user 101 may browse the one or more offers received from the shopping system 130 to find the one or more offers identified in the notification for use at the particular merchant system 160 location.
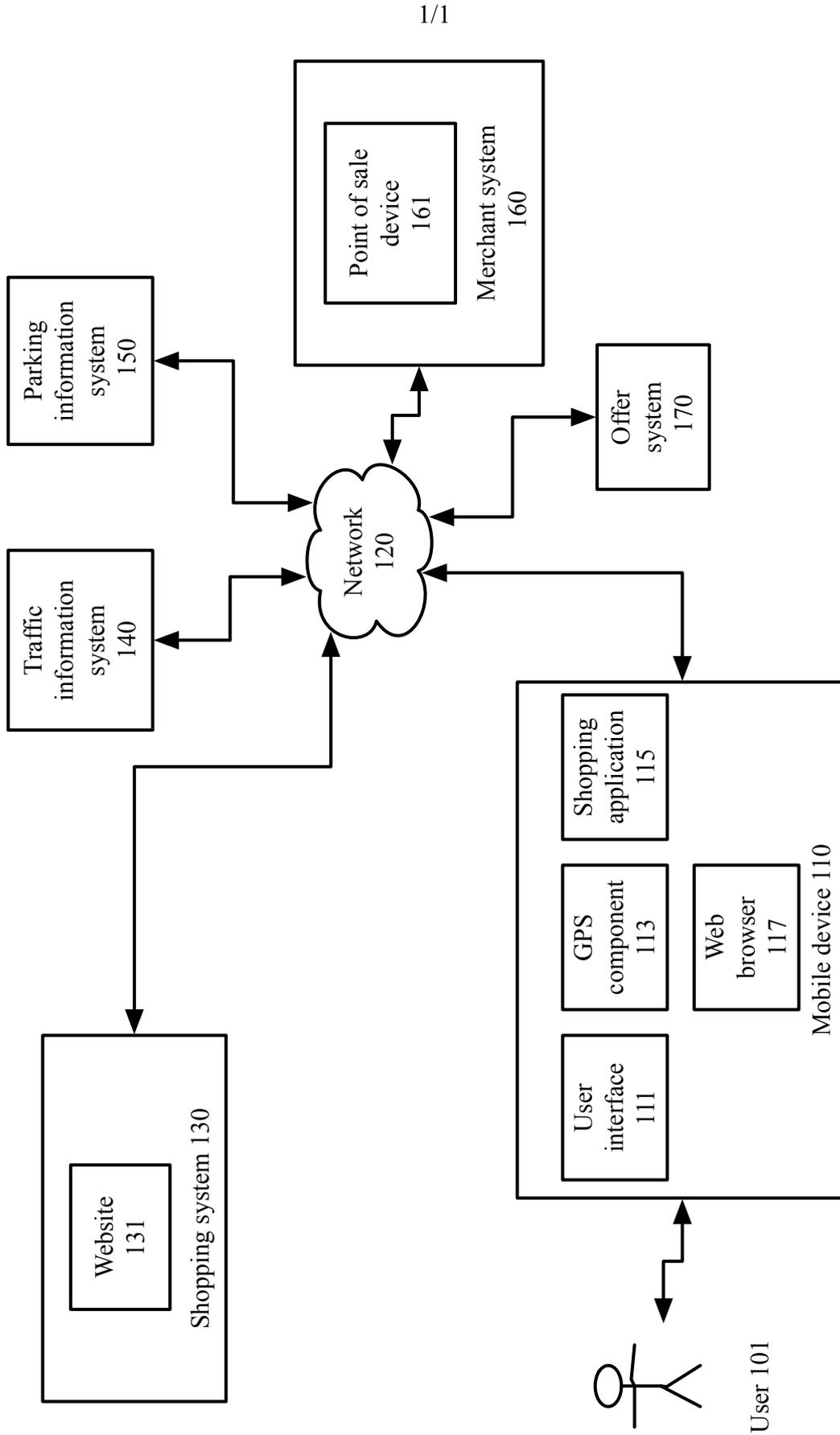
The user 101 uses the offer in a transaction at the merchant system 160 location. In an example, the user 101 selects the offer presented by the shopping application 115 via the user interface 111 of the mobile device 110. In an example, in response to selecting the offer, the shopping application 115 displays a barcode representing the offer via the user interface 111 of the mobile device 110 and a merchant system point of sale device 161 operator scans the barcode displayed by the user interface 111 to apply the offer to a transaction. In another example, the user 101 taps the mobile device 110 to a point of sale device 161 at the merchant system 160 location to establish a local network connection – for example, a near field communication ("NFC") channel, Wi-Fi communication channel, Bluetooth communication channel, or Bluetooth low-energy communication channel – between the mobile device 110 and the point of sale device 161 and the shopping application 115

transmits the one or more offers to the point of sale device 161 from the mobile device 110 via the local network connection.

The shopping system 130 periodically updates the shopping route as the user 101 completes the shopping route or based on new conditions. For example, the shopping system 130 receives updated location data from the mobile device 110 via the network 120. The shopping system 130 may receive updated traffic information from the traffic system 140 via the network 120. The shopping system 130 may receive updated location information, updated inventory information, and updated hours of operation information from each of the multiple merchant systems 160 via the network 120. The shopping system 130 may receive updated parking information from the parking information system 150 via the network 120. The shopping system 130 may receive one or more subsequent offers from the offer system 170 via the network 120. In an example, the shopping system 130 modifies the shopping route based on the updated location data from the mobile device 110, the updated traffic information, the updated information from each of the multiple merchant systems, the updated parking information, and/or one or more other new conditions that may affect the shopping route or necessitate a modification of the shopping route. The shopping system 130 transmits the modified or updated shopping route to the mobile device 110 via the network 120 for presentation to the user 101.

By using and relying on the methods and systems described herein, the shopping system 130 provides shopping routes to users in accordance with wish lists of users 101, locations of mobile devices 110 of users, one or more shopping route preferences of users 101, traffic information, parking information, inventory information of merchant systems 160, hours of operation of merchant systems 160, locations of merchant systems 160, and/or other relevant data.

Figure 1