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# Dynamic Location-Based Shopping Lists Using Smart Assistants

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## Dynamic location-based shopping lists using smart assistants

ABSTRACT

Despite the growth of online retail, shopping at brick-and-mortar stores remains a powerful draw for even tech-savvy customers. For example, many customers still like to examine certain items, e.g., fruits, vegetables, clothing, etc., prior to purchasing such items. Customers who make purchases at physical stores often create shopping lists on their mobile devices. With user permission, the techniques of this disclosure detect the user's location (or navigation plan) to determine if items on the shopping list are available at physical stores in proximity to the user's current or immediate-future locations, and notify the user appropriately.

KEYWORDS

- shopping list
- location-aware service
- smart assistant
- virtual assistant
- brick-and-mortar store
- physical store
- natural language processing

BACKGROUND

Smart assistants are opening up an array of possibilities in the ways that users interact with their devices and the things that they can accomplish using the devices. Using natural language processing (NLP), smart assistants enable users to accomplish relatively complex tasks using only voice commands. One useful application of a smart assistant is the creation and maintenance of shopping lists. A user can simply say, for example, "add eggs to my shopping

list," and the smart assistant adds eggs as an item to a shopping list. There can be multiple lists, and lists can be shared between users. Users can bring up lists while at a store. When a user buys or no longer needs an item, it can be swiped away or removed through voice commands.

A feature of shopping lists is that the lists can be used directly to purchase the items online. This is a seamless experience involving the smart assistant, shopping lists, and online retail. However, shopping lists are very often used for shopping in a physical store as opposed to online. Even avid users of technology still purchase many things in stores. While grocery delivery is available, many people still prefer to see what they are buying, for example, fruits and vegetables. Furthermore, if a user wants to buy an item online, there often isn't any reason to add it to a list — the user can simply purchase it right away at the store. The main utility of a list is to remind the user of items to be purchased when the user is at a physical store. In that sense, the shopping list functions as a notepad that the user can add things to with voice commands.

DESCRIPTION

There is opportunity to train smart assistants to better serve the user for physical-store shopping, allowing users to accomplish shopping tasks more effectively and efficiently. With user permission, the techniques of this disclosure use location data along with a shopping list to tell the user where shopping-list items may be purchased. This information can be present within the shopping list, in a map application, etc. Notifications can automatically be displayed when a user is near a store that sells items on the list. There are additional convenient variations:

- prices can be displayed so that the user can find a nearby store with the best prices;

- items may be grouped based on what is available at the same store;

- the number of stops needed to purchase items on a list can be optimized;

- a user's favorite stores can be learned, e.g., by studying location history, and such stores can be surfaced preferentially;

- a user already at a particular store can be notified of items on the list that are available at that store;

- as the user's location changes and/or shopping list changes, the stores, groupings, and suggestions change; etc.
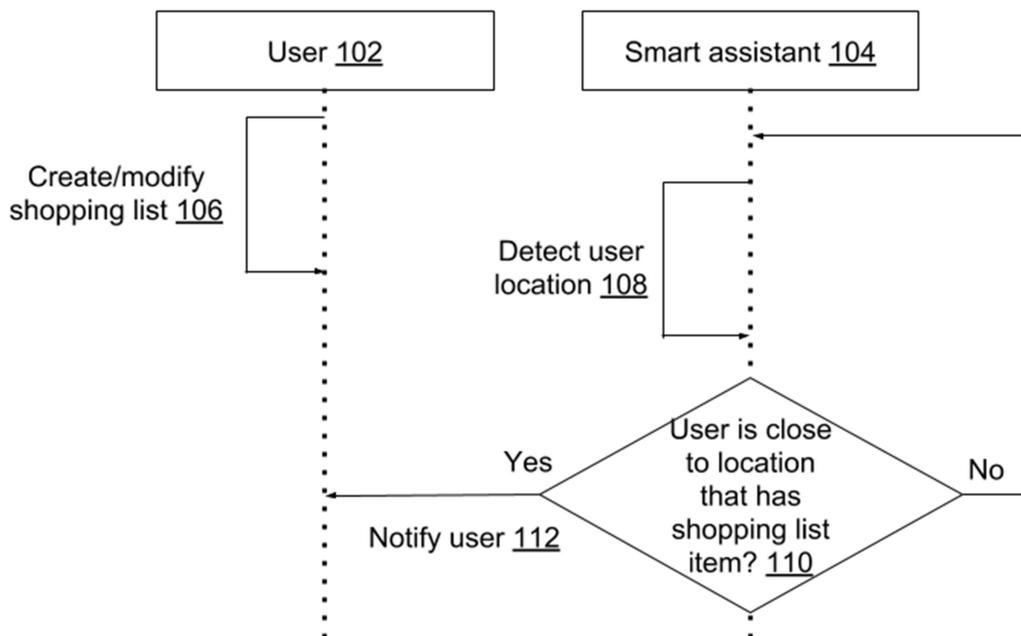


**Fig. 1: Interactions between a user and smart assistant**

Fig. 1 illustrates example interactions between a user (102) and a smart assistant (104), per techniques of this disclosure. The user creates or modifies a shopping list (106) on their mobile device. With user permission, the smart assistant detects present or near-future location of the user (108). The smart assistant determines if the user is close (or shortly will be close) to a retail location that sells one or more items on the shopping list (110). If so, the smart assistant notifies the user of their proximity to a suitable retail location (112). If not, the smart assistant

continues to monitor user location and look for opportunities to leverage user location and shopping list items.

Smart assistants have access to information about product availability at many stores, e.g., via explicit partnership between the smart assistant and retailers, via search, via user reviews, etc. Smart assistants also have access to data regarding the locations of stores, e.g., via map apps. With user permission, smart assistants can also detect the user's location. The smart assistant can therefore determine when a user is close to a particular store. In this manner, the techniques of this disclosure combine location data and shopping lists formulated with smart assistants to inform users about nearby locations where items on a shopping list can be purchased.

Beyond showing a nearby store where an item on the shopping list can be purchased, there can be various additional enhancements, as follows.

Grouping of items: The items on a list can be grouped based on what is available at the same store. For example, groceries can be one grouping, electronics another, and clothes yet another. Alternately, items available at a particular store might be a grouping. Items in a list can be organized and shown by the group if so commanded by the user. Several ways to group items together may be utilized, e.g., fewest number of stores; fewest stops (in case some stores are located in physical proximity, e.g., within a shopping mall); shortest travelled distance; smallest amount of time spent per store; shortest checkout lines; best customer service; lowest total costs; etc.

Per the techniques of this disclosure, the user is able to pick a store from the stores that sell the listed items, and see items that can be bought from that store, while leaving the rest of the items grouped separately using one of the above-listed (or custom) criteria. When a user is

actually in a store, grouping can be made to show what items on the list are available at the store. The user also has the option of pinning (saving) a grouping of one or more items, such that this grouping does not change with the user's location or list. Items and groupings can also be added to a map app. For example, when the user opens a map app from the shopping list, the locations of stores where list items can be purchased are shown.

Store comparison: One store might have a subset of items from the list. The smart assistant can provide additional information about the items on the list, such as prices. A user is able to select an item and see prices at various nearby stores. Upon picking a different store for a certain item from the available list of stores, the list dynamically updates itself to take into account the selection. A map interface is provided with prices for a particular item shown on a store-by-store basis on a map.

Favorite stores: The user can have favorite stores. These can be set manually or be determined automatically based on the stores that the user most often visits. If the user shops predominantly at certain favorite stores, those stores are used predominantly (or by default) for the shopping list. Groupings and additional information such as prices may be provided only for the favorite stores, or be tied in with default groupings in cases where a favorite store is just a little further away from another store that is not marked a favorite.

Notifications: A notification can be sent to alert the user that they can purchase items on their list at the store. Notifications are sent, e.g., if the user is near a store where items on their list can be purchased. As the user location changes, the shopping list is dynamically updated with nearby places to purchase the items on their list.

The user can request that the smart assistant help buy one or more items on a list. If so, the smart assistant groups items to achieve a combination of one or more of the following: minimize the number of stops; minimize the distance traveled; minimize the total price; use favorite stores; etc. The user can customize and move items between groups, e.g., to shop at different stores, and have a map application lay out a travel (navigation) plan for them. Groceries can be ordered for either delivery or pickup. The techniques herein can be applied towards pickup, e.g., to automatically order shopping list items for pickup at the nearest retailer, and provide the user with navigation guidance to get there. Thus combining smart assistants with shopping lists, location data, and map applications enhances the experience and usefulness of the shopping list.

The techniques of this disclosure can be implemented in any smart assistant device, e.g., mobile device such as a smartphone with a software assistant, smart speaker, in-car assistant, etc.

CONCLUSION

Customers who make purchases at physical stores often create shopping lists on their mobile devices. With user permission, the techniques of this disclosure detect the user's location (or navigation plan) to determine if items on the shopping list are available at physical stores in proximity to the user's current or immediate-future locations, and notify the user appropriately.