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Automatic, voice-activated adjustment of shopping cart

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ABSTRACT

Screen-free virtual assistants, e.g., provided via smart speakers or appliances, are often used for online shopping by issuing voice commands. Prior to checkout, a user often finds a need to remove some items, e.g., due to cost or other considerations. When the device lacks a screen that allows viewing the shopping cart, it is difficult for the user to determine an optimal combination of items to remove such that high-priority items remain in the shopping cart and the shopping cart remains within budget.

This disclosure describes techniques that enable a user to command a virtual assistant to automatically prune a shopping list to stay within budget. The virtual assistant determines the items that stay in the shopping cart by removing the least important items from the cart, by reducing the quantity of items that cannot be dropped from the cart, or both.

KEYWORDS

- E-commerce
- Virtual assistant
- Voice command
- Spoken command
- Smart speaker
- Shopping cart
- Shopping budget

BACKGROUND

Screen-free virtual assistants, e.g., provided via smart speakers or appliances, are often used for online shopping by issuing voice commands. For example, a user might issue to a

virtual assistant the command “add shampoo to my cart,” with the result that the virtual assistant adds shampoo to the shopping cart.

Prior to checkout, a user often finds a need to remove some items, e.g., due to cost or other considerations. When the device lacks a screen that allows viewing the shopping cart, it is difficult for the user to determine an optimal combination of items to remove such that high-priority items remain in the shopping cart and the shopping cart remains within budget. Users can address this problem by commanding the virtual assistant to read aloud the contents of the shopping cart items and then by providing commands to remove items or reduce quantities of specific items. This process is error-prone and tedious.

DESCRIPTION

The techniques of this disclosure enable online shoppers to easily adjust their e-commerce shopping cart using voice commands. The shopping cart adjustment is done as follows:

- by automatically removing least important items from the cart, or
- by reducing the quantity of certain items, or
- a combination of the above.

The user is informed of the removal or reduction of items and can provide confirmation or choose to edit the shopping cart before placement of the order.

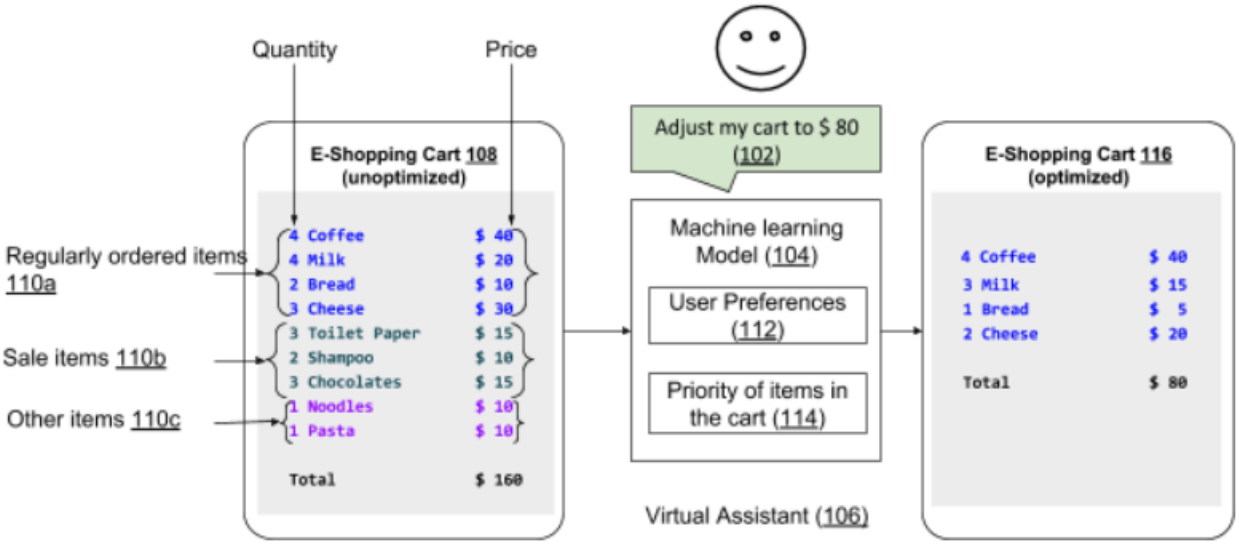

Fig.1: Automatic, voice-activated shopping cart adjustment by virtual assistant

Fig. 1 illustrates automatic, voice-activated shopping cart adjustment by a virtual assistant, per techniques of this disclosure. A user commands a virtual assistant (106) to build a shopping cart (108) using voice commands. The shopping cart includes regularly ordered items (110a), e.g., items that the user orders on a daily, weekly, or other periodic basis, denoted {R1, R2, … , RN}; sale items (110b), e.g., items where the discount is above a threshold, or where the metadata of the item includes an on-sale tag, denoted {S1, S2, …, SN}; and all other items (110c), denoted {O1, O2, …, ON}; etc. The shopping cart is as yet unoptimized, e.g., it does not as yet comply with a budget constraint.

With user permission, the virtual assistant uses a trained machine learning model (104) that draws upon user preferences (112) and the aforementioned priority of items (114) to build an optimized shopping cart (116). For example, when the user issues a command (102) to adjust the total budget to $80, the virtual assistant prunes the unoptimized shopping cart (108) which has a cost of $160) to determine the optimized shopping cart (116) which has a cost of $80.

The order in which items are dropped from the cart to meet budget is as follows:

- Items from the other-items category {O1, O2, …, ON} are dropped or reduced in quantity one by one until no items from this category are left, or until the budget is met.
- If the budget constraint is still not met, items from the on-sale category, {S1, S2, …, SN} are dropped or reduced in quantity one by one until no items from this category are left, or until the budget is met..
- If the budget constraint is still not met, items from the regularly-ordered category, {R1, R2, …, RN} are dropped or reduced in quantity one by one until the budget constraint is met. If the user's preferences around regularly-ordered items is set, the quantity of least important regularly-ordered items is reduced and until the budget is met. If the user's preference around regularly-ordered items is not set, then items are dropped starting from the least-important, regularly-ordered items until the budget is met.

Training the machine learning model

The machine learning model that determines the next item to be dropped (or reduced in quantity) within a certain category is trained in a supervised manner, e.g., by feeding in shopping cart add-drop patterns from a population of users that have provided permission for use of such data to train a machine learning model. Such shopping cart add-drop patterns are obtained, e.g., when permitting users use their mobile devices or computers visually (rather than orally) to shop online. If the users permit use of demographic information, the machine learning model can also be trained to be cognizant of the user's demographic, e.g., the geography, age group, gender, etc. No user data is utilized without permission. Data used for training is pre-processed to remove certain types of information, e.g., payment information, demographic information, personal information of the user, etc.

Examples of voice commands

(i) “Adjust my cart to my budget of $150.” This voice-command adjusts the e-commerce shopping cart value to less than or equal to $150.

(ii) “Adjust my cart to my budget of around $150.” This voice-command adjusts the e-commerce shopping cart value to within $150 plus or minus x%, where x is a predetermined number, e.g., 5%.

(iii) “Fix my cart budget at $150.” This voice-command continually adjusts the composition of the shopping cart so that it remains within $150 throughout the shopping process. Each time a user adds or removes an item, the shopping cart can be re-optimized by determining the current order of importance of items, and by removing the current least important items from the cart, by reducing the quantity of items that cannot be dropped from the cart, or by a combination of the above.

In this manner, the techniques of this disclosure enable a budget-based pruning of a shopping cart using a single voice command.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user’s social network, social actions or activities, profession, a user’s preferences, or a user’s current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user’s identity may be treated so that no personally identifiable information can be determined for the user, or a user’s geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of

a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques that enable a user to command a virtual assistant to automatically prune a shopping list to stay within budget. The virtual assistant determines the items that stay in the shopping cart by removing the least important items from the cart, by reducing the quantity of items that cannot be dropped from the cart, or both.