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ASSISTANT AUTOGENERATED PLANNING LISTS

ABSTRACT

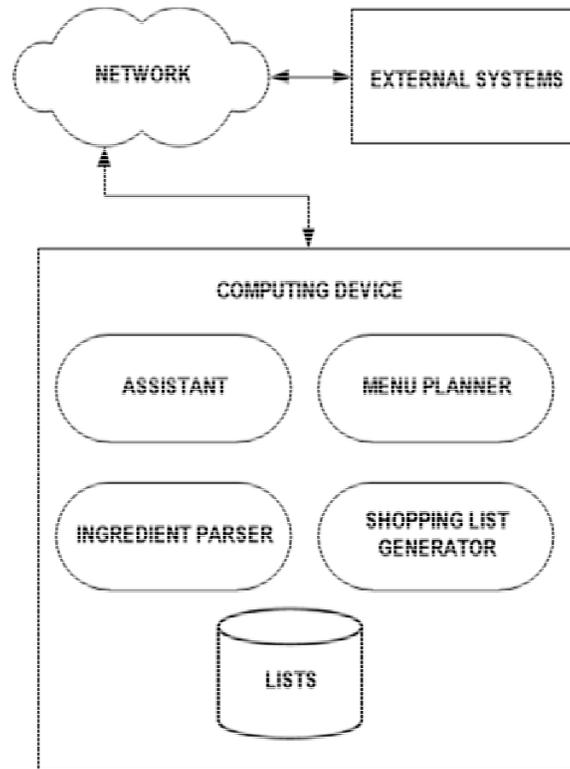
A virtual, intelligent, or computational assistant (e.g., also referred to simply as an “assistant”) is described that automatically generates grocery lists for preparing one or more meals or other events. The assistant is provided with a meal plan (e.g., a menu of one or more meals or dishes). The assistant parses the meal plan into individual recipes and from the recipes, generates a list of ingredients and respective quantities. The assistant then creates a shopping list from the ingredients list. The items in the shopping list may be grouped by meal or dish, item type, store location, need for refrigeration, date of meal, or some other way. A user may review the list while shopping at a physical store or may interact with the assistant, or apart from the assistant, to manually or automatically order the items online. The techniques are applicable beyond just groceries and could be used for generating other types of lists: the assistant may automatically generate any lists containing items that are needed to execute a specific plan. Other non-limiting examples include packing lists based on events, tool lists based on projects, route lists based on events, and so on.

DESCRIPTION

Virtual, intelligent, or computational assistants (e.g., also referred to simply “assistants”) execute on counter-top computing devices, mobile phones, automobiles, and many other types of computing devices. Assistants output useful information, responds to users’ needs, or otherwise performs certain operations to help users complete real-world and/or virtual tasks. Some assistants are configured to record shopping lists that each user can later retrieve or modify during subsequent interactions with the assistant. While providing a user interface for creating a

shopping list via an assistant may be somewhat useful (e.g., as the user may tell the assistant what he or she needs to buy as opposed to writing or typing out each item), the user still has to recall and provide as some sort of input to the assistant, each item that he or she wants included on the shopping list, the same way he or she would create a shopping list by writing or typing the list by-hand.

The example system shown in FIG. 1 provides an assistant architecture that automatically generates a grocery list of items to procure for executing a meal plan. The assistant is provided with a meal plan, i.e., a menu of one or more meals or dishes. After parsing the meal plan into individual recipes, the assistant creates a list of ingredients and respective quantities for the entire meal plan. The assistant generates a grocery list from the list of ingredients and provides the list to a user. The user may review the list while shopping at a physical store or may use the list (or command the assistant to use the list) to perform online ordering of the items on the list. This way, the user need not manually create (in whole or part) a grocery list, and need only provide the assistant with a desired list of meals. While described primarily from the perspective of creating grocery lists for preparing meals, the techniques described herein are equally applicable to enabling assistants to automatically generate procurement lists for executing any type of plan (e.g., auto generated materials lists for automotive or home repair, packing lists for travel, etc.).

**FIG. 1**

The system of FIG. 1 includes one or more external systems and a computing device communicating across a network to provide an assistant service that automatically generates grocery lists. The network of FIG. 1 represents a combination of any one or more public or private communication networks, for instance, television broadcast networks, cable or satellite networks, cellular networks, Wi-Fi networks, broadband networks, and/or other type of network for transmitting data (e.g., telecommunications and/or media data) between various computing devices, systems, and other communications and media equipment.

The computing device represents any type of computing device that is configured to execute an assistant and communicate on a network. The external systems represent any type of server or other computing system that is configured to support the assistants executing at the computing device. The external systems and computing device can be personal, corporate, or government owned computing devices. In some examples, the computing device may be a

shared asset of multiple users. Examples of the computing device include servers, mainframes, cloud computing environments, mobile phones, tablet computers, wearable computing devices, countertop computing devices, home automation computing devices, laptop computers, desktop computers, televisions, stereos, automobiles, and any and all other type of mobile and non-mobile computing device that is configured to execute an assistant.

The computing device includes an assistant that executes across the external systems and the computing device to provide assistant services to users of the computing device. Examples of assistant services include: setting up reminders, creating calendar entries, booking travel, online ordering, sending messages or other communications, controlling televisions, lights, thermostats, appliances, or other computing devices, providing navigational instructions, or any other conceivable task or operation that may be performed by an assistant.

As a user interacts with the assistant, the assistant may obtain personal information about the user including a context of the user as determined by the context identifier. Examples of personal information include: habits, preferences, notes, lists, contacts, communications, interests, location histories, and other types of user information. After receiving explicit permission from the user, the assistant may store, the personal information at user information data stores and in the course of providing assistant services, make use of the personal information stored at the user information data stores.

The external systems and the computing device treat the information stored at the information stores so that the information is protected, encrypted, or otherwise not susceptible to hacking or unauthorized use. The information stored at the information data stores may be stored locally at the computing device and/or remotely (e.g., in a cloud computing environment provided by the external systems and which is accessible via the network of FIG. 1).

The assistant stores and organizes user created information, such as shopping lists, memos, notes, meal plans, and reminders, on behalf of the user of the assistant. The assistant automatically generates shopping lists for items needed to be procured to execute a plan. Specifically, and as one example, the assistant automatically generates grocery lists of ingredients needed to prepare one or more meals according to one or more recipes. The assistant may automatically generate other types of lists, however, beyond grocery lists.

The assistant may rely on a menu planner of the computing device to identify one or more recipes for creating one or more meals of a menu or meal plan. For example, the assistant may receive input from a user as the user tells the assistant “I would like to impress my in-laws who are visiting from Denmark. Help me plan a traditional Danish Christmas dinner”. The assistant may provide as input to the menu planner “Danish Christmas Dinner” and receive as output, one or more recipes. For example, the menu planner may perform a search for “Danish Christmas Dinner” at one or more of the external systems and locate recipes for: roast duck, boiled potatoes, red cabbage, gravy, ris à l'amande (i.e., hot rice pudding), etc. In other examples, the user may be more specific and tell the assistant that he or she wants to specifically make a particular dish or series of dishes and the assistant will provide an indication of the dish or dishes as input to the menu planner and receive as output one or more recipes for creating the dishes. The assistant may output the recipes to the user (e.g., at a screen or via a printer) so the user may later rely on the recipes to prepare the menu. The assistant may allow the user to confirm the recipes (e.g., the user may tell the assistant “looks good, put it on the calendar for Friday night) or add / modify the recipes in the plan so that the user can customize the plan..

The assistant then feeds the recipes received from the menu planner into the ingredient parser which parses the recipes into a list of ingredients and their respective quantities. That is,

the ingredient parser identifies each item in each menu and groups like items from different recipes together. The ingredient parser adds quantities of each item that appears multiple times in the recipes to determine a total quantity of a particular ingredient that would be needed to prepare the entire meal plan. The ingredient parser outputs a list of ingredients and respective quantities required to create the entire menu or series of dishes that are input into the menu planner.

Lastly, and optionally, the assistant relies on the shopping list generator to organize the list of ingredients into a shopping list. The assistant may output the shopping list to the user (e.g., audibly, at a screen, or via a printer) so the user may go to a store and buy each item on the list. In some examples, the assistant may organize the list according to item location in a particular grocery store or group ingredients according to category or ingredient type. The assistant may search the Internet to identify multiple stores for purchasing the ingredients in the list and annotate the shopping list with or organize it according to the store that sells each ingredient, including optionally at the cheapest price and/or closest to the user's home location. The assistant can even, at the request of the user, place an online order at one or more online grocery stores for each item in the list. The assistant may walk the user through the shopping list and allow the user an opportunity to modify or remove items from the list (e.g., either ingredients that the user would like to substitute, already has on hand, or otherwise prefers not to have included in the list). For example, the assistant may provide an interface from which the user can cross off items he or she already has on hand.

In this way, the user need not spend hours researching and planning a particular meal plan but instead may rely on the assistant to do the research and planning for him or her. The user simply needs to provide the assistant with a menu of dishes he or she wishes to prepare, or

even a general idea of the type of meal he or she is considering, and the assistant will provide the recipes and ingredients list needed to make the meal plan happen.

Furthermore, the assistant may be provided access to the user's calendar as well as the user's historic recipe selections in such a manner that patterns can be identified, and the appropriate shopping lists created and made available to the user. For example, if, based on user's past recipe selections, entries in a calendar, etc., it is determined that a user cooks pasta each Monday night, the assistant may automatically select pasta dish suggestions to present to the user for a Monday night as part of weekly menu planning in the menu planner function. As another example, if the user selects one of a rotating set of four salad recipes each week over a period of time, the user's pattern of selection may be determined and the assistant can suggest one of the four recipes, avoiding repeats, following a prior pattern, etc.

As another example, to show how the techniques may apply to non-grocery lists, consider an example where a user of the computing device needs to pack for a trip. The user may tell the assistant his or her destination, duration of the trip, and other details of the trip and allow the assistant to generate one or more outfits that the user can wear at different times on each of the days. Alternatively, the assistant may automatically be informed of a user's upcoming trip when the user receives an e-mail confirmation from a hotel, airline, or travel agency. With the different outfits identified for each of the different days, the assistant determines articles of clothing and quantities necessary for the user to pack and have on hand during the trip. The assistant may automatically generate a packing list that has each item of clothing categorized by type, outfit, etc. and total quantity.

By automatically generating a shopping list from nothing more than a general menu or meal plan, or packing list from nothing more than a travel itinerary, the assistant makes planning

future grocery shopping, travel packing, etc. easier and less time consuming for the user. The above examples are just some use cases for the assistant architecture shown in FIG. 1, the assistant architecture has many other applications and use cases.