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ASSISTANT TAPERING LANGUAGE PATTERNS

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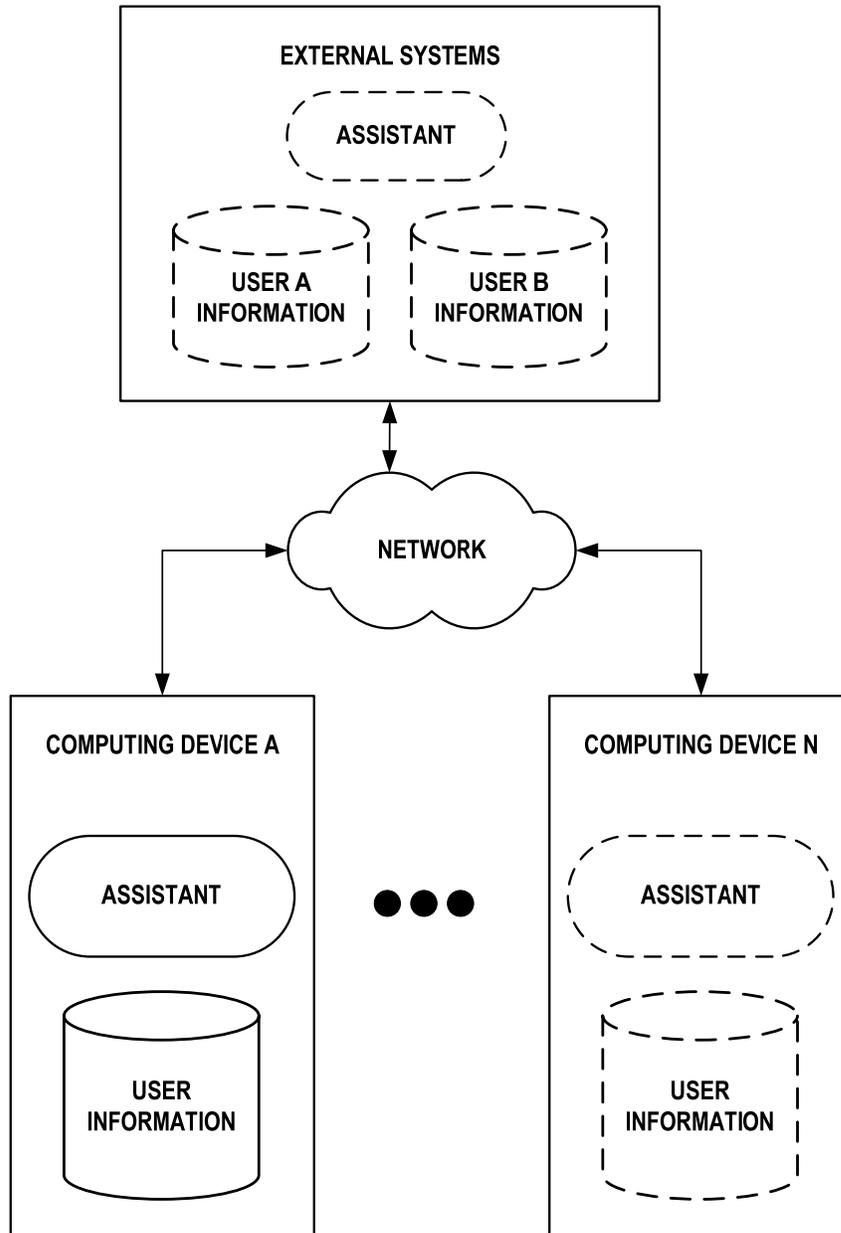# ASSISTANT TAPERING LANGUAGE PATTERNS

ABSTRACT

A virtual, intelligent, or computational assistant (e.g., also referred to simply as an "assistant") is described that is configured to become more concise (e.g., reduce, slim down, taper, etc.) when interacting with a user over time. Depending on the extent of the user's background knowledge, saying too much may be just as bad as saying too little. In fact, speakers whose language is perceived as either too elaborate (information in excess) or too abbreviated (insufficient info) may be perceived to be uncooperative. To avoid such negative perceptions, the assistant may provide users with more elaborate, more detailed, more precise content for situations and routines likely to be unfamiliar. In contrast, when familiarity is likely, the assistant may keep the message brief.

DESCRIPTION

Assistants execute on counter-top devices, mobile phones, automobiles, and many other type 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 may provide output, such as text or speech, to users. In some cases, assistants may maintain a constant level of conciseness throughout their interactions with a user. In other words, some assistants may not have a varying dress of familiarity or language intimacy with users.

The example system shown in FIG. 1 provides an assistant that becomes more concise with a user as it gets to know the user better (e.g., over time). For example, the assistant may

initially provide all potentially relevant contextual information during a particular interaction

with the user. As the interaction proceeds, the assistant may begin to abbreviate some

information.

EXTERNAL SYSTEMS

ASSISTANT

USER A
INFORMATION

USER B
INFORMATION

NETWORK

COMPUTING DEVICE A

ASSISTANT

USER
INFORMATION

COMPUTING DEVICE N

ASSISTANT

USER
INFORMATION

FIG. 1

The system of FIG. 1 includes one or more external systems and computing devices A–N

communicating across a network with each of computing devices A–N executing an assistant

that performs operations involving groups of people. 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. Computing devices A–N represent any type of computing device, server, or other system that is configured to execute an assistant and communicate on a network. The external systems represent any type of mainframe, cloud computing environment, server or other computing system that is configured to support the assistants executing at computing devices A–N.

The external systems and computing devices A–N can be personal computing devices. In some examples, the external systems and/or computing devices A–N may be shared assets of multiple users. Examples of computing devices A–N include 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. For example, computing device A may be a countertop assistant device and computing device N may be a mobile phone or automobile infotainment system.

An assistant executes across any combination of external systems one or more of computing devices A–N to provide assistant services to users of computing devices A–N. Examples of assistant services include: setting up reminders, creating calendar entries, booking travel, online ordering, sending messages or other communications, reading text aloud, 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. Examples of personal information include: habits, word or phrase selections, voice samples, routines, 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 computing devices A–N and the assistant treat the information stored at the information stores so that the information is protected, encrypted, or otherwise not susceptible to unauthorized use. The information stored at the information data stores may be stored locally at each of computing devices A–N 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).

Further to the descriptions below, a user may be provided with controls allowing the user to make an election as to both if and when the assistant, the computing device, or the computing systems described herein can collect or make use of supplemental data (e.g., user information or contextual information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if and when 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 supplemental data is collected about the user, how that supplemental data is used, and what supplemental data is provided to the user.

In operation, the assistant may taper the language used during an interaction (e.g., conversation, session, etc.) as the interaction progressed. As one example, in the case where the assistant is providing a certain set of options more than once in the same interaction, the assistant may progressively pair down the wording. For instance, where the certain set of options is "Would you like to reply to it, play it again, or go on to the next one?," the assistant may initially list off the full set of options (e.g., the assistant may output synthesized speech saying "Would you like to reply to it, play it again, or go on to the next one?"). When subsequently providing the user with the set of options, the assistant may provide a paired down version (e.g., the assistant may output synthesized speech saying "Do you want to reply, play it again, or keep going?"). The assistant may further pair down the set of options when subsequently providing the user with the set of options (e.g., the assistant may output synthesized speech saying "Reply, play it again, or play the next one?").

As another example, in the case where the assistant is responding to a question multiple times during an interaction, the assistant may become more succinct with subsequent responses to the question. For instance, when the assistant is asked "What temperature is it outside?," the assistant may output synthesized speech saying "It is 55 degrees in Syracuse right now." If the assistant is subsequently asked "what temperature is it supposed to be tomorrow?," the assistant may output synthesized speech saying "The forecast is 42 degrees" (i.e., the assistant may avoid restating the city to which the temperature applies). If the assistant is subsequently asked "what

temperature is it supposed to be the day after tomorrow?," the assistant may output synthesized speech saying "47 degrees" (i.e., the assistant may avoid restating the city to which the temperature applies and avoid restating that the number being provided is a forecast).

By becoming more succinct with the user during an interaction, the assistant may avoid monotony and may leverage familiarity as the user will what was previously said during the interaction. 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.