

CLAIMS

WHAT IS CLAIMED IS:

1. A computer-implemented method, comprising:
 - collecting a data set for training a machine-learning model to predict response messages, wherein collecting the data set includes storing one or more previous messages included in a previous communication session between a network device and a terminal device associated with an agent;
 - facilitating a communication session between a terminal device and a network device, wherein the communication session enables the terminal device and the network device to exchange one or more messages;
 - receiving a new message during the communication session;
 - evaluating the new message using the trained machine-learning model, wherein evaluating the new message includes evaluating any messages exchanged before the new message was received;
 - predicting a response to the new message, wherein predicting the response includes using a result of the evaluation to determine which previous message to select from the data set as the predicted response to the new message; and
 - facilitating displaying the predicted response at the terminal device, wherein when the predicted response is selected, the predicted response is automatically transmitted to the network device during the communication session.
2. The computer-implemented method of claim 1, further comprising:
 - identifying an attribute associated with a previous message included in the data set;
 - appending an attribute tag to the previous message, wherein the attribute tag corresponds to the identified attribute; and
 - training the machine-learning model using the attribute tag.
3. The computer-implemented method of claim 1, wherein the communication session between the terminal device and the network device includes a bot, wherein the bot is configured to autonomously communicate with the network device.

4. The computer-implemented method of claim 3, further comprising:
 - evaluating the new message using the bot, wherein evaluating the new message includes automatically identifying a query from the new message, and wherein the new message is evaluated in real-time as the new message is received;
 - querying a database using the identified query; and
 - displaying one or more results of the querying at the terminal device.
5. The computer-implemented method of claim 1, wherein the machine-learning model includes a recurrent neural network (RNN) or a convolutional neural network (CNN).
6. The computer-implemented method of claim 1, wherein determining the predicted response message further comprises:
 - generating a vector representation of the new message;
 - using the machine-learning model to compare the vector representation of the new message to an additional vector representation of the one or more previous messages included in the data set; and
 - selecting a previous message from the one or more previous messages included in the data set, wherein the previous message is selected based on the comparison.
7. The computer-implemented method of claim 1, further comprising:
 - generating a matrix for a candidate message, wherein the matrix includes a number of words included in the previous message and a vector representation of the previous message;
 - generating an additional matrix for the new message, wherein the additional matrix includes a number of words included in the new message and a vector representation of the new message; and
 - comparing the matrix with the additional matrix to determine whether to select the previous message as the predicted response.
8. A system, comprising:
 - one or more data processors; and

a non-transitory computer-readable storage medium containing instructions which, when executed on the one or more data processors, cause the one or more data processors to perform operations including:

collecting a data set for training a machine-learning model to predict response messages, wherein collecting the data set includes storing one or more previous messages included in a previous communication session between a network device and a terminal device associated with an agent;

facilitating a communication session between a terminal device and a network device, wherein the communication session enables the terminal device and the network device to exchange one or more messages;

receiving a new message during the communication session;

evaluating the new message using the trained machine-learning model, wherein evaluating the new message includes evaluating any messages exchanged before the new message was received;

predicting a response to the new message, wherein predicting the response includes using a result of the evaluation to determine which previous message to select from the data set as the predicted response to the new message; and

facilitating displaying the predicted response at the terminal device, wherein when the predicted response is selected, the predicted response is automatically transmitted to the network device during the communication session.

9. The system of claim 8, wherein the operations further comprise:

identifying an attribute associated with a previous message included in the data set;

appending an attribute tag to the previous message, wherein the attribute tag corresponds to the identified attribute; and

training the machine-learning model using the attribute tag.

10. The system of claim 8, wherein the communication session between the terminal device and the network device includes a bot, wherein the bot is configured to autonomously communicate with the network device.

11. The system of claim 10, further comprising:
 - evaluating the new message using the bot, wherein evaluating the new message includes automatically identifying a query from the new message, and wherein the new message is evaluated in real-time as the new message is received;
 - querying a database using the identified query; and
 - displaying one or more results of the querying at the terminal device.
12. The system of claim 8, wherein the machine-learning model includes a recurrent neural network (RNN) or a convolutional neural network (CNN).
13. The system of claim 8, wherein predicting the response further comprises:
 - generating a vector representation of the new message;
 - using the machine-learning model to compare the vector representation of the new message to an additional vector representation of the one or more previous messages included in the data set; and
 - selecting a previous message from the one or more previous messages included in the data set, wherein the previous message is selected based on the comparison.
14. The system of claim 8, wherein the operations further comprise:
 - generating a matrix for a candidate message, wherein the matrix includes a number of words included in the previous message and a vector representation of the previous message;
 - generating an additional matrix for the new message, wherein the additional matrix includes a number of words included in the new message and a vector representation of the new message; and
 - comparing the matrix with the additional matrix to determine whether to select the previous message as the predicted response.
15. A computer-program product tangibly embodied in a non-transitory machine-readable storage medium, including instructions configured to cause a data processing apparatus to perform operations including:

collecting a data set for training a machine-learning model to predict response messages, wherein collecting the data set includes storing one or more previous messages included in a previous communication session between a network device and a terminal device associated with an agent;

facilitating a communication session between a terminal device and a network device, wherein the communication session enables the terminal device and the network device to exchange one or more messages;

receiving a new message during the communication session;

evaluating the new message using the trained machine-learning model, wherein evaluating the new message includes evaluating any messages exchanged before the new message was received;

predicting a response to the new message, wherein predicting the response includes using a result of the evaluation to determine which previous message to select from the data set as the predicted response to the new message; and

facilitating displaying the predicted response at the terminal device, wherein when the predicted response is selected, the predicted response is automatically transmitted to the network device during the communication session.

16. The computer-program product of claim 15, wherein the operations further comprise:

identifying an attribute associated with a previous message included in the data set;

appending an attribute tag to the previous message, wherein the attribute tag corresponds to the identified attribute; and

training the machine-learning model using the attribute tag.

17. The computer-program product of claim 15, wherein the communication session between the terminal device and the network device includes a bot, wherein the bot is configured to autonomously communicate with the network device.

18. The computer-program product of claim 17, further comprising:

evaluating the new message using the bot, wherein evaluating the new message includes automatically identifying a query from the new message, and wherein the new message is evaluated in real-time as the new message is received;

querying a database using the identified query; and

displaying one or more results of the querying at the terminal device.

19. The computer-program product of claim 15, wherein the machine-learning model includes a recurrent neural network (RNN) or a convolutional neural network (CNN).

20. The computer-program product of claim 15, wherein predicting the response further comprises:

generating a vector representation of the new message;

using the machine-learning model to compare the vector representation of the new message to an additional vector representation of the one or more previous messages included in the data set; and

selecting a previous message from the one or more previous messages included in the data set, wherein the previous message is selected based on the comparison.