SYSTEMS AND METHODS FOR MANAGING INTERACTION INVITATIONS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 62,886,647, filed August 14, 2019 and titled "SYSTEMS AND METHODS FOR MANAGING INTERACTION INVITATIONS" which is hereby incorporated by reference in its entirety and for all purposes.

FIELD

[0002] The present disclosure relates generally to facilitating routing of communications. More specifically, techniques are provided to automatically initiate interaction invitations, and to dynamically route invitation acceptances, such as invitations and acceptances involving a user invited to interact with an agent using artificial intelligence (AI) and machine learning techniques.

SUMMARY

[0002a] According to a first aspect of the present disclosure, there is provided a computer-implemented method including: determining capacities associated with a plurality of terminal devices, wherein the capacities are based on workloads for agents associated with the plurality of terminal devices; accessing historical acceptance data for past interaction invitations to user devices associated with one or more criteria; accessing current data for current user devices which are currently active in a network, wherein the current data includes associations between the current user devices and the one or more criteria; determining a current number of available interactions based on the historical acceptance data and the current data; determining that the current number of available interactions is less than a number of the current user devices; determining a subset of the current user devices matching the current number of available interactions, wherein determining includes prioritizing the subset using a likelihood of acceptance of a predictive interaction invitation, and wherein likelihood of acceptance includes the historical acceptance data and the one or more criteria; facilitating an interaction between an agent and a current user device in the subset using the predictive interaction invitation; and generating updated historical acceptance data using the interaction data and the historical acceptance data.

[0002b] According to a second aspect of the present disclosure, there is provided a system, including: 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: determining capacities associated with a plurality of terminal devices, wherein the capacities are based on workloads for agents associated with the plurality of terminal devices; accessing historical acceptance data for past interaction invitations to user devices associated with one or more criteria; accessing current data for current user devices which are currently active in a network, wherein the current data includes associations between the current user devices and the one or more criteria; determining a current number of available interactions based on the historical acceptance data and the current data; determining that the current number of available interactions is less than a

number of the current user devices; determining a subset of the current user devices matching the current number of available interactions, wherein determining includes prioritizing the subset using a likelihood of acceptance of a predictive interaction invitation, and wherein likelihood of acceptance includes the historical acceptance data and the one or more criteria; facilitating an interaction between an agent and a current user device in the subset using the predictive interaction invitation; and generating updated historical acceptance data using the interaction data and the historical acceptance data.

[0002c] According to a third aspect of the present disclosure, there is provided 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: determining capacities associated with a plurality of terminal devices, wherein the capacities are based on workloads for agents associated with the plurality of terminal devices; accessing historical acceptance data for past interaction invitations to user devices associated with one or more criteria; accessing current data for current user devices which are currently active in a network, wherein the current data includes associations between the current user devices and the one or more criteria; determining a current number of available interactions based on the historical acceptance data and the current data; determining that the current number of available interactions is less than a number of the current user devices; determining a subset of the current user devices matching the current number of available interactions, wherein determining includes prioritizing the subset using a likelihood of acceptance of a predictive interaction invitation, and wherein likelihood of acceptance includes the historical acceptance data and the one or more criteria; facilitating an interaction between an gent and a current user device in the subset using predictive the interaction invitation; and generating updated historical acceptance data using the interaction data and the historical acceptance data.

[0003] Embodiments described herein related systems and methods for automatically managing interaction invitations in a communication system. In some embodiments, elements of the communication system can be considered a computer implemented predictive invitation or dialing system. Various embodiments can use history information from the communication to match terminal (e.g. agent) device capacity in the system to possible interactions that can be initiated proactively by the system with user devices that are connected to the system. In some examples, this can also involve supplemental information about the users associated with the user devices, as well as agents associated with the terminal devices having capacity. Machine learning analysis can be used in such a communication system to increase capacity utilization of terminal devices while avoiding negative user experiences (e.g., such as negative experiences where a system contacts a user device with an invitation and then has a user wait for an agent after the user accepts an invitation). Invitation interaction management described herein can use machine learning to avoid such negative results while improving system efficiencies and utilization.

[0004] One example embodiment includes a communication server determining capacities associated with a terminal devices based on workloads for agents associated with the terminal

CLAIMS

1. A computer-implemented method comprising:

determining capacities associated with a plurality of terminal devices, wherein the capacities are based on workloads for agents associated with the plurality of terminal devices;

accessing historical acceptance data for past interaction invitations to user devices associated with one or more criteria;

accessing current data for current user devices which are currently active in a network, wherein the current data includes associations between the current user devices and the one or more criteria;

determining a current number of available interactions based on the historical acceptance data and the current data;

determining that the current number of available interactions is less than a number of the current user devices;

determining a subset of the current user devices matching the current number of available interactions, wherein determining includes prioritizing the subset using a likelihood of acceptance of a predictive interaction invitation, and wherein likelihood of acceptance includes the historical acceptance data and the one or more criteria;

facilitating an interaction between an agent and a current user device in the subset using the predictive interaction invitation; and

generating updated historical acceptance data using the interaction data and the historical acceptance data.

2. The method of claim 1, wherein the current data includes real-time data gathered via the network for the current user devices in the network available to receive a targeted interaction invitation.

3. The method of claim 1, wherein determining the current number of available interactions includes:

providing the capacities for the agents and the current data for the current user devices to a machine learning system trained using the historical acceptance data including the one or more criteria; and

receiving a value for the current number of available interactions from the machine learning system.

4. The method of claim 3, wherein the machine learning system includes:

a first neural network trained to determine the value for the current number of available interactions using the historical acceptance data; and

a second neural network trained to determine a likelihood of acceptance for each device of the current user devices using the historical acceptance data.

5. The method of claim 1 further comprising:

receiving interaction data for the interactions between the agents and the one or more user devices;

accessing updated current data for the current user devices in the network; and

generating an updated current number of available interaction invitations based on the updated historical acceptance data and the updated current data for the current user devices.

6. 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:

determining capacities associated with a plurality of terminal devices, wherein the capacities are based on workloads for agents associated with the plurality of terminal devices;

accessing historical acceptance data for past interaction invitations to user devices associated with one or more criteria;

accessing current data for current user devices which are currently active in a network, wherein the current data includes associations between the current user devices and the one or more criteria;

determining a current number of available interactions based on the historical acceptance data and the current data;

determining that the current number of available interactions is less than a number of the current user devices;

determining a subset of the current user devices matching the current number of available interactions, wherein determining includes prioritizing the subset using a likelihood of acceptance of a predictive interaction invitation, and wherein likelihood of acceptance includes the historical acceptance data and the one or more criteria;

facilitating an interaction between an agent and a current user device in the subset using the predictive interaction invitation; and

generating updated historical acceptance data using the interaction data and the historical acceptance data.

7. The system of claim 6, wherein the current data includes real-time data gathered via the network for the current user devices in the network available to receive a targeted interaction invitation.

8. The system of claim 6, wherein determining the current number of available interactions includes:

providing the capacities for the agents and the current data for the current user devices to a machine learning system trained using the historical acceptance data including the one or more criteria; and

receiving a value for the current number of available interactions from the machine learning system.

9. The system of claim 8, wherein the machine learning system includes:

a first neural network trained to determine the value for the current number of available interactions using the historical acceptance data; and

a second neural network trained to determine a likelihood of acceptance for each device of the current user devices using the historical acceptance data.

10. The system of claim 6 further comprising:

receiving interaction data for the interactions between the agents and the one or more user devices;

accessing updated current data for the current user devices in the network; and

generating an updated current number of available interaction invitations based on the updated historical acceptance data and the updated current data for the current user devices.

11. 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:

determining capacities associated with a plurality of terminal devices, wherein the capacities are based on workloads for agents associated with the plurality of terminal devices;

accessing historical acceptance data for past interaction invitations to user devices associated with one or more criteria;

accessing current data for current user devices which are currently active in a network, wherein the current data includes associations between the current user devices and the one or more criteria;

determining a current number of available interactions based on the historical acceptance data and the current data;

determining that the current number of available interactions is less than a number of the current user devices;

determining a subset of the current user devices matching the current number of available interactions, wherein determining includes prioritizing the subset using a likelihood of acceptance of a predictive interaction invitation, and wherein likelihood of acceptance includes the historical acceptance data and the one or more criteria;

facilitating an interaction between an agent and a current user device in the subset using the predictive interaction invitation; and

generating updated historical acceptance data using the interaction data and the historical acceptance data.

12. The computer-program product of claim 11, wherein the current data includes real-time data gathered via the network for the current user devices in the network available to receive a targeted interaction invitation.

13. The computer-program product of claim 11, wherein determining the current number of available interactions includes:

providing the capacities for the agents and the current data for the current user devices to a machine learning system trained using the historical acceptance data including the one or more criteria; and

receiving a value for the current number of available interactions from the machine learning system.

14. The computer-program product of claim 11, wherein the machine learning system includes:

a first neural network trained to determine the value for the current number of available interactions using the historical acceptance data; and

a second neural network trained to determine a likelihood of acceptance for each device of the current user devices using the historical acceptance data.

15. The computer-program product of claim 11 further comprising:

receiving interaction data for the interactions between the agents and the one or more user devices;

accessing updated current data for the current user devices in the network; and

generating an updated current number of available interaction invitations based on the updated historical acceptance data and the updated current data for the current user devices.