CLAIMS

1. A network device, comprising:

a transceiver to send and receive data over a network; and

one or more processors that are operative to perform actions including:

tracking actions of a plurality of customers of a telecommunications service provider in using functionality provided by the telecommunications service provider, including actions performed by the plurality of customers after some customers of the plurality of customers receive a treatment and other customers of the plurality of customers do not receive the treatment;

determining, for a ranking model with information about a feature measure, and based at least in part on the tracked actions, multiple target frequency distributions for multiple target groups of customers and multiple control frequency distributions for multiple control groups of customers, wherein each of the multiple target frequency distributions corresponds to effects on the feature measure from actions for a respective target group of customers that receive the treatment, and wherein each of the multiple control frequency distributions corresponds to effects on the feature measure from actions for a respective control group of customers that do not receive the treatment;

predicting, based on the ranking model, multiple customers that are a subset of the plurality of customers and are expected to alter their future actions in response to a message to perform modifications to operations of accounts of the multiple customers with the telecommunications service provider, including, for each of the multiple customers:

identifying one of the multiple target groups of customers to which the customer belongs, and identifying one of the multiple control groups of customers associated with the identified one target group of customers; and

determining a predicted lift in the feature measure for the customer based on a difference between a target frequency distribution for the

identified one target group of customers and a control frequency distribution for the identified one control group of customers;

selecting the predicted multiple customers to receive the message to perform the modifications;

sending, over the network to client devices of the predicted multiple customers, electronic communications that include the message to perform the modifications;

tracking, over a period of time after sending the electronic communications, responses of the predicted multiple customers to the message based at least in part on further actions that are taken by at least some of the predicted multiple customers over the period of time to perform the modifications; and

updating, based on the tracked responses, stored information about the predicted multiple customers, to adjust future predictions that the predicted multiple customers will alter further future actions based on one or more future messages.

2. The network device of claim 1 wherein the predicting of the multiple customers includes determining the predicted lift in the feature measure for each of the plurality of customers to represent a determined response of the customer to the message, including to randomly select a first value from a target frequency distribution for each of the plurality of customers and to randomly select a second value from a control frequency distribution for each of the plurality of customers and to determine a difference between the first and second values, rank ordering each of the plurality of customers based on the determined predicted lift for the customer, and using the rank ordering to identify the subset of the plurality of customers.

3. The network device of claim 1 wherein the selecting of the predicted multiple customers includes determining that the predicted multiple customers are

eligible to receive the message based at least in part on attributes of the predicted multiple customers and on constraints associated with the message.

4. The network device of claim 1 wherein the predicting of the multiple customers includes assigning at least one customer to a control group that does not receive the message.

5. The network device of claim 4 wherein the predicting of the multiple customers further includes determining to assign the at least one customer to the control group based at least in part on the at least one customer having previously received a different message related to the message.

6. The network device of claim 1 wherein tracking of the responses to the message includes receiving replies to the sent message from some or all of the predicted multiple customers, and wherein the updating of the stored information about the predicted multiple customers includes adaptively refining the ranking model based in part on the received replies, and selecting another message to provide to at least one of the predicted multiple customers based in part on the refined ranking model.

7. The network device of claim 1 wherein the period of time is at least greater than one week, and wherein the tracking of the responses is based on a defined metric that includes a delay during the period of time between the sending of the messages and the further actions.

8. The network device of claim 1 wherein the selecting of the predicted multiple customers is performed to satisfy one or more defined criteria that include at least one of a frequency of assignments to a group or a total number of customers for a group.

9. A non-transitory computer-readable storage device having computer-executable instructions stored thereon that, in response to execution by a processor unit, cause the processor unit to perform operations including:

tracking, by the processor unit, actions of a plurality of customers having accounts with a telecommunications service provider, including actions performed by the plurality of customers after some customers of the plurality of customers receive a treatment and other customers of the plurality of customers do not receive the treatment;

determining, by the processor unit, for a ranking model with information about a feature measure, and based at least in part on the tracked actions, multiple target frequency distributions for multiple target groups of customers and multiple control frequency distributions for multiple control groups of customers, wherein each of the multiple target frequency distributions corresponds to effects on the feature measure from actions for a respective target group of customers that receive the treatment, and wherein each of the multiple control frequency distributions corresponds to effects on the feature measure from actions for a respective control group of customers that do not receive the treatment;

predicting, by the processor unit, and based on the ranking model for a message related to accounts of the plurality of customers, multiple customers that are a subset of the plurality of customers and are expected to alter their future actions based on the message, and selecting the predicted multiple customers to receive the message, including, for each of the multiple customers:

identifying one of the multiple target groups of customers to which the customer belongs, and identifying one of the multiple control groups of customers associated with the identified one target group of customers; and

determining a predicted lift in the feature measure for the customer based on a difference between a target frequency distribution for the identified one target group of customers and a control frequency distribution for the identified one control group of customers;

managing, by the processor unit, the message, including:

sending one or more communications that include the message over one or more networks to client devices of the predicted multiple customers;

tracking responses of the predicted multiple customers for the message based at least in part on further actions that are taken by at least some of those predicted multiple customers over a period of time related to the accounts of the at least some customers; and

updating, based on the tracked responses, stored information about the predicted multiple customers, to adjust future predictions that customers will alter further future actions based on one or more future messages.

10. The non-transitory computer-readable storage device of claim 9 wherein the predicting of the multiple customers includes determining the predicted lift in the feature measure for each of the plurality of customers to represent a determined response of the customer to the message, including to randomly select a first value from a target frequency distribution for each of the plurality of customers and to randomly select a second value from a control frequency distribution for each of the plurality of customers and to determine a difference between the first and second values, and rank ordering each of the plurality of customers based on the determined predicted lift for the customer.

11. The non-transitory computer-readable storage device of claim 9 wherein the selecting of the predicted multiple customers to receive the message includes determining that the predicted multiple customers are eligible to receive the message based at least in part on attributes of the predicted multiple customers and on rules associated with the message.

12. The non-transitory computer-readable storage device of claim 9 wherein the predicting of the multiple customers includes selecting at least one customer for a control group that does not receive the message.

13. The non-transitory computer-readable storage device of claim 12 wherein the selecting of the at least one customer for the control group is based at least in part on the at least one customer being previously assigned to a target group for a different message that is related to the message.

14. The non-transitory computer-readable storage device of claim 9 wherein the tracking of the responses of the predicted multiple customers includes receiving replies to the sent one or more communications, and wherein the updating of the stored information includes adaptively refining the ranking model and selecting at least one customer to receive at least one additional message based in part on the refined ranking model.

15. The non-transitory computer-readable storage device of claim 9 wherein the processing unit is one of a plurality of processing units that are arranged to execute as asynchronous and independent processes and that are coordinated through an interchange of data at defined points.

16. The non-transitory computer-readable storage device of claim 9 wherein the selecting of the predicted multiple customers is performed to satisfy one or more defined criteria that include at least one of a frequency of assignments to a target group, or a total number of customers for a target group.

17. A system, comprising:

a non-transitory data storage device; and

a computer device that accesses and stores data on the data storage device and employs at least one processor to perform actions, including:

tracking actions of a plurality of customers of a service provider in using functionality provided by the service provider, including actions performed by the plurality of customers after some customers of the plurality of customers receive a treatment and other customers of the plurality of customers do not

receive the treatment, and wherein the plurality of customers have accounts with the service provider;

determining, for a ranking model with information about a feature measure, and based at least in part on the tracked actions, multiple target frequency distributions for multiple target groups of customers and multiple control frequency distributions for multiple control groups of customers, wherein each of the multiple target frequency distributions corresponds to effects on the feature measure from actions for a respective target group of customers that receive the treatment, and wherein each of the multiple control frequency distributions corresponds to effects on the feature measure from actions for a respective control group of customers that do not receive the treatment;

predicting, based on the ranking model, multiple customers that are a subset of the plurality of customers and are expected to alter their future actions based on a message to perform modifications to the accounts of the multiple customers with the service provider, and selecting the predicted multiple customers to receive the message, including, for each of the multiple customers:

identifying one of the multiple target groups of customers to which the customer belongs, and identifying one of the multiple control groups of customers associated with the identified one target group of customers; and

determining a predicted lift in the feature measure for the customer based on a difference between a target frequency distribution for the identified one target group of customers and a control frequency distribution for the identified one control group of customers;

sending, to client devices of the predicted multiple customers over one or computer networks, the message to perform the modifications;

tracking, over a period of time after sending the message, responses of the predicted multiple customers to the message based at least in part on further actions that are taken by at least some of the predicted multiple customers over the period of time to perform the modifications; and

updating, based on the tracked responses, stored information about the predicted multiple customers, to adjust future predictions that the predicted

multiple customers will alter further future actions based on one or more future messages.

18. The system of claim 17 wherein the predicting of the multiple customers includes determining the predicted lift in the feature measure for each of the plurality of customers to represent a determined response of the customer to the message, including to randomly select a first value from a target frequency distribution for each of the plurality of customers and to randomly select a second value from a control frequency distribution for each of the plurality of customers and to determine a difference between the first and second values, and rank ordering each of the plurality of customers based on the determined predicted lift for the customer, and wherein the ranking model includes one of a tree, a logistic a regression model, a neural network, a support vector regression, a Gaussian process regression, or a Generalized Bayesian model.

19. The system of claim 17 wherein the selecting of the predicted multiple customers includes determining that the predicted multiple customers are eligible to receive the message based at least in part on attributes of the predicted multiple customers and on constraints associated with the message.

20. The system of claim 17 wherein the selecting of the predicted multiple customers includes assigning at least one customer to a control group that does not receive the message.

21. The system of claim 17 wherein the selecting of the predicted multiple customers further includes determining to assign at least one customer to a target group for the message based on the at least one customer having previously received a different message related to the message.

22. The system of claim 17 wherein the tracking of the responses is based on a defined metric that includes a delay during the period of time between the sending of the message and the further actions.