that can send images as well as text using standardized communication protocols. Messaging services are convenient for users in that they enable asynchronous communication, alerting users when a message comes in without the users having to pay constant attention as they would during a traditional audio-based telephone call.

SUMMARY

[0005] The term embodiment and like terms are intended to refer broadly to all of the subject matter of this disclosure and the claims below. Statements containing these terms should be understood not to limit the subject matter described herein or to limit the meaning or scope of the claims below. Embodiments of the present disclosure covered herein are defined by the claims below, not this summary. This summary is a high-level overview of various aspects of the disclosure and introduces some of the concepts that are further described in the Detailed Description section below. This summary is not intended to identify key or essential features of the claimed subject matter, nor is it intended to be used in isolation to determine the scope of the claimed subject matter. The subject matter should be understood by reference to appropriate portions of the entire specification of this disclosure, any or all drawings and each claim.

[0006] Embodiments of the present disclosure provide technical solutions to address the technical challenges presented above. For example, a network device (e.g., a user's mobile phone) may be used to make a telephone call to a landline telephone associated with a client device (e.g., a business's device). If the telephone call is terminated, either the network device or the client device may generate a text message to the other and establish a communication session. The client device may present a variety of options to the network device of service requests that may be completed by text message. The network device may transmit the service request and the service request may be fulfilled by the client. At some point thereafter, the client device may terminate the communication session and hand off the conversation to a server (e.g., an aggregator associated with a plurality of client devices, and/or a plurality of terminal devices and agents). The server may accept queries and natural language communications from the network device and answer the queries as appropriate. Unlike the client device, queries made to the server do not have to be client-specific, and may relate to a plurality of clients or any other subject unrelated to the client.

[0007] According to a first aspect of the present disclosure, there is provided a computer implemented method including: receiving a first message of a first communication type at a user device as part of an interaction, wherein the first message includes a plurality of routing paths for routing communication from the user device to a client device, and wherein, when the first message is received from the client device, a connection management system associated with the interaction stores an intent value associated with the interaction; generating, by the user device, a selected routing path of the plurality of routing paths; facilitating a two-way communication session as part of the interaction, wherein the two-way communication session is between the user device and a node of the client device, and wherein the node is determined based on the selected routing path; facilitating termination of the two-way communication session, wherein when two-way communication session is terminated, a server receives a transmission indicating the selected routing path; receiving, by the user device, data related to the selected routing path, wherein termination of the two-way communication session causes transmission of the data related to the selected routing path; transmitting, by the user device, a new message, wherein the new message includes intent indicator data to be used by the server to generate an updated intent value; generating, by the server when the server receives the intent indicator data, an updated intent value in response to the intent value and the intent indicator data; receiving, by the user device, a response message of a second communication type different than the first communication type, wherein when the response message is received as part of the interaction from the server, the response message includes one or more suggestions for routing communication from the user device to the client device that correspond to the updated intent value; and facilitating presentation of the response message on a display of the user device.

[0008] 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: receiving a first message of a first communication type at a user device as part of an interaction, wherein when the first message is received from a client device, the first message includes a plurality of routing paths for routing communication from the user device to a client device, and wherein a connection management system associated with the interaction stores an intent value associated with the interaction; generating, by the user device, a selected routing path of the plurality of routing paths; facilitating a two-way communication session as part of the interaction, wherein the two-way communication session is between the user device and a node of the client device, and wherein the node is determined based on the selected routing path; facilitating termination of the two-way communication session; receiving, by the user device, data related to the selected routing path, wherein termination of the two-way communication session causes transmission of the data related to the selected routing path; transmitting, by the user device, a new message, wherein the new message includes intent indicator data to be used by a server to generate an updated intent value; receiving, by the user device, a response message of a second communication type different than the first communication type, wherein when the response message is received as part of the interaction from the server, the response message includes one or more suggestions for routing communication from the user device to the client device that correspond to the updated intent value; and facilitating presentation of the response message on a display of the user device.

[0009] 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: receiving a first message of a first communication type at a user device as part of an interaction, wherein the first message includes a plurality of routing paths for routing communication from the user device to a client device, and wherein when the first message is received from the client device, a connection management system associated with the interaction stores an intent value associated with the interaction; generating, by the user device, a selected routing path of the plurality of routing paths; facilitating a two-way communication session as part of the interaction, wherein the two-way communication session is between the user device and a node of the client device, wherein the node is determined based on the selected routing path; facilitating termination of the two-way communication session, wherein when the two-way communication session is terminated, a server receives a transmission indicating the selected routing path; receiving, by the user device, data related to the selected routing path, wherein termination of the two-way communication session causes transmission of the data related to the selected routing path; transmitting, by the user device, a new message, wherein the new message includes intent indicator data to be used by the server to generate an updated intent value, and wherein, when the intent indicator data is received at the server, the updated intent value is generated by the server in response to the intent value and the intent indicator data; receiving, by the user device, a response message of a second communication type different than the first communication type, wherein when the response message is received as part of the interaction from the server, the response message includes one or more suggestions for routing communication from the user device to the client device that correspond to the updated intent value; and facilitating presentation of the response message on a display of the user device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present disclosure is described in conjunction with the appended figures:

[0011] FIG. 1 shows a block diagram of an embodiment of a network interaction system;

[0012] FIG. 2 shows a block diagram of an embodiment of a network interaction system that includes a connection management system;

[0013] FIG. 3 shows a representation of a protocol-stack mapping of connection components' operation;

[0014] FIG. 4 represents a multi-device communication exchange system according to an embodiment;

[0015] FIG. 5 shows a block diagram of an embodiment of a connection management system;

CLAIMS

1. A computer-implemented method comprising:

receiving a first message of a first communication type at a user device as part of an interaction, wherein the first message includes a plurality of routing paths for routing communication from the user device to a client device, and wherein, when the first message is received from the client device, a connection management system associated with the interaction stores an intent value associated with the interaction;

generating, by the user device, a selected routing path of the plurality of routing paths;

facilitating a two-way communication session as part of the interaction, wherein the two-way communication session is between the user device and a node of the client device, and wherein the node is determined based on the selected routing path;

facilitating termination of the two-way communication session, wherein when two-way communication session is terminated, a server receives a transmission indicating the selected routing path;

receiving, by the user device, data related to the selected routing path, wherein termination of the two-way communication session causes transmission of the data related to the selected routing path;

transmitting, by the user device, a new message, wherein the new message includes intent indicator data to be used by the server to generate an updated intent value;

generating, by the server when the server receives the intent indicator data, an updated intent value in response to the intent value and the intent indicator data;

receiving, by the user device, a response message of a second communication type different than the first communication type, wherein when the response message is received as part of the interaction from the server, the response message includes one or more suggestions for routing communication from the user device to the client device that correspond to the updated intent value; and

facilitating presentation of the response message on a display of the user device.

2. The method of claim 1, wherein the response message is a text message.

3. The method of claim 1, wherein the connection management system is further connected to the client device; and wherein the client device is connected to a landline telephone.

4. The method of claim 3, further comprising:

prior to receiving the first message from the client device at the user device, generating a telephone call by the user device to the landline telephone; and

wherein the new message is received at the connection management system, and the connection management system generates the response message by using a machine learning model to evaluate the selected routing path and the intent indicator data.

5. The method of claim 3, wherein the landline telephone is associated with a same telephone number as the client device.

6. The method of claim 3, wherein the one or more suggestions includes aggregated data related to the selected routing path for a plurality of client devices, wherein the aggregated data is specific to the user device.

7. 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:

receiving a first message of a first communication type at a user device as part of an interaction, wherein when the first message is received from a client device, the first message includes a plurality of routing paths for routing communication from the user device to a client device, and wherein a connection management system associated with the interaction stores an intent value associated with the interaction;

generating, by the user device, a selected routing path of the plurality of routing paths;

facilitating a two-way communication session as part of the interaction, wherein the two-way communication session is between the user device and a node of the client device, and wherein the node is determined based on the selected routing path;

facilitating termination of the two-way communication session;

receiving, by the user device, data related to the selected routing path, wherein termination of the two-way communication session causes transmission of the data related to the selected routing path;

transmitting, by the user device, a new message, wherein the new message includes intent indicator data to be used by a server to generate an updated intent value;

receiving, by the user device, a response message of a second communication type different than the first communication type, wherein when the response message is received as part of the interaction from the server, the response message includes one or more suggestions for routing communication from the user device to the client device that correspond to the updated intent value; and

facilitating presentation of the response message on a display of the user device.

8. The system of claim 7, wherein the response message is a text message.

9. The system of claim 7, wherein the connection management system is further connected to the client device; and wherein the client device is connected to a landline telephone.

10. The system of claim 9, wherein the operations further include:

prior to receiving the first message from the client device at the user device, generating a telephone call by the user device to the landline telephone; and

wherein the new message is received at the connection management system, and the connection management system generates the response message by using a machine learning model to evaluate the selected routing path and the intent indicator data.

11. The system of claim 9, wherein the landline telephone is associated with a same telephone number as the client device.

12. The system of claim 7, wherein the one or more suggestions includes aggregated data related to the selected routing path for a plurality of client devices, wherein the aggregated data is specific to the user device.

13. 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:

receiving a first message of a first communication type at a user device as part of an interaction, wherein the first message includes a plurality of routing paths for routing communication from the user device to a client device, and wherein when the first message is received from the client device, a connection management system associated with the interaction stores an intent value associated with the interaction;

generating, by the user device, a selected routing path of the plurality of routing paths;

facilitating a two-way communication session as part of the interaction, wherein the two-way communication session is between the user device and a node of the client device, wherein the node is determined based on the selected routing path;

facilitating termination of the two-way communication session, wherein when the two-way communication session is terminated, a server receives a transmission indicating the selected routing path;

receiving, by the user device, data related to the selected routing path, wherein termination of the two-way communication session causes transmission of the data related to the selected routing path;

transmitting, by the user device, a new message, wherein the new message includes intent indicator data to be used by the server to generate an updated intent value, and wherein, when the intent indicator data is received at the server, the updated intent value is generated by the server in response to the intent value and the intent indicator data;

receiving, by the user device, a response message of a second communication type different than the first communication type, wherein when the response message is received as part of the interaction from the server, the response message includes one or more suggestions for routing communication from the user device to the client device that correspond to the updated intent value; and

facilitating presentation of the response message on a display of the user device.

14. The computer-program product of claim 13, wherein the message is a text message.

15. The computer-program product of claim 13, wherein the connection management system is further connected to the client device; and wherein the client device is connected to a landline telephone.

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

prior to receiving the first message from the client device at the user device, generating a telephone call by the user device to the landline telephone; and

wherein the new message is received at the connection management system, and the connection management system generates the response message by using a machine learning model to evaluate the selected routing path and the intent indicator data.

17. The computer-program product of claim 15, wherein the landline telephone is associated with a same telephone number as the client device.

18. The computer-program product of claim 13, wherein the one or more suggestions includes aggregated data related to the selected routing path for a plurality of client devices, wherein the aggregated data is specific to the user device.

19. The computer-program product of claim 13, further comprising processing metadata for the selected routing path to determine an intent value from the intent indicator data and the metadata.

20. The computer-program product of claim 13 further comprising:

receiving communication data from the two-way communication session;

processing the communication data using natural language processing to generate natural language understanding data; and

selecting an intent value based on the intent indicator data using the natural language understanding data such that the intent value for the intent indicator data is a signal of a purpose of a user of the user device in a context of the communication data from the two-way communication session.