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(54) **ESTIMATING WAIT TIMES FOR REQUESTS**

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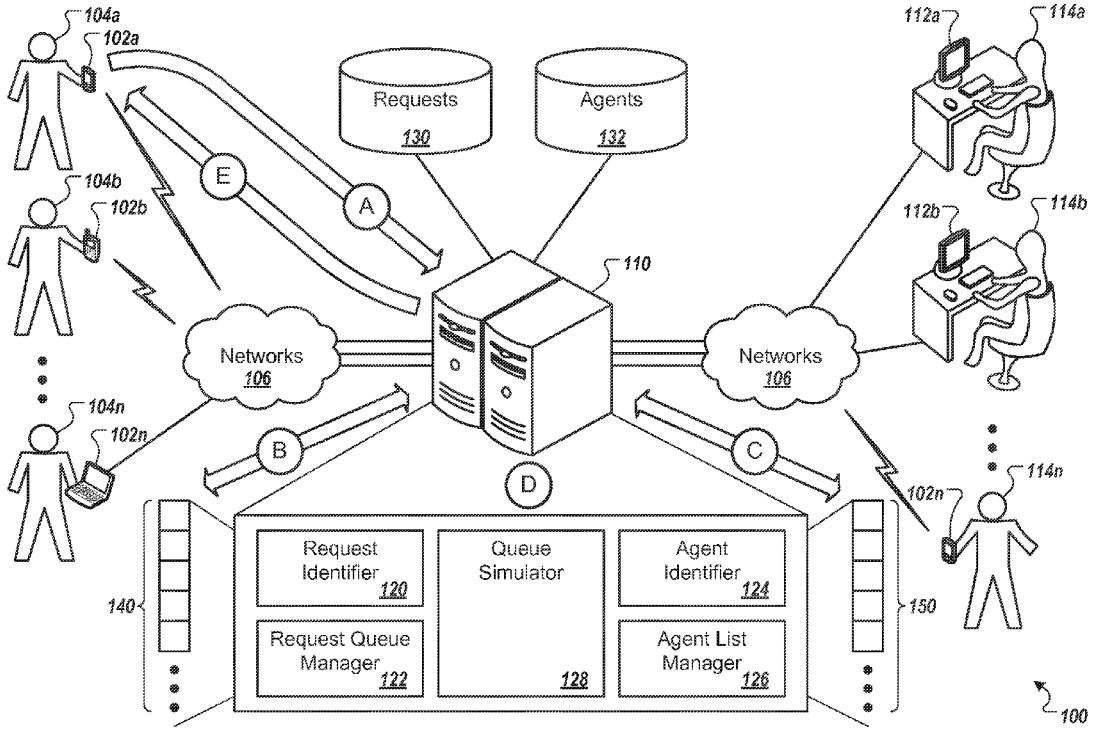
(57) **ABSTRACT**

Methods, systems, and computer program products are provided for estimating wait times for requests. One example method in identifying requests in a queue where each request includes a category, identifying a list of agents for servicing the requests including identifying agent capabilities for servicing particular request categories, running a simulation to determine an estimated wait time for a specific request in the queue, and providing an estimate of the wait time based on the simulation.



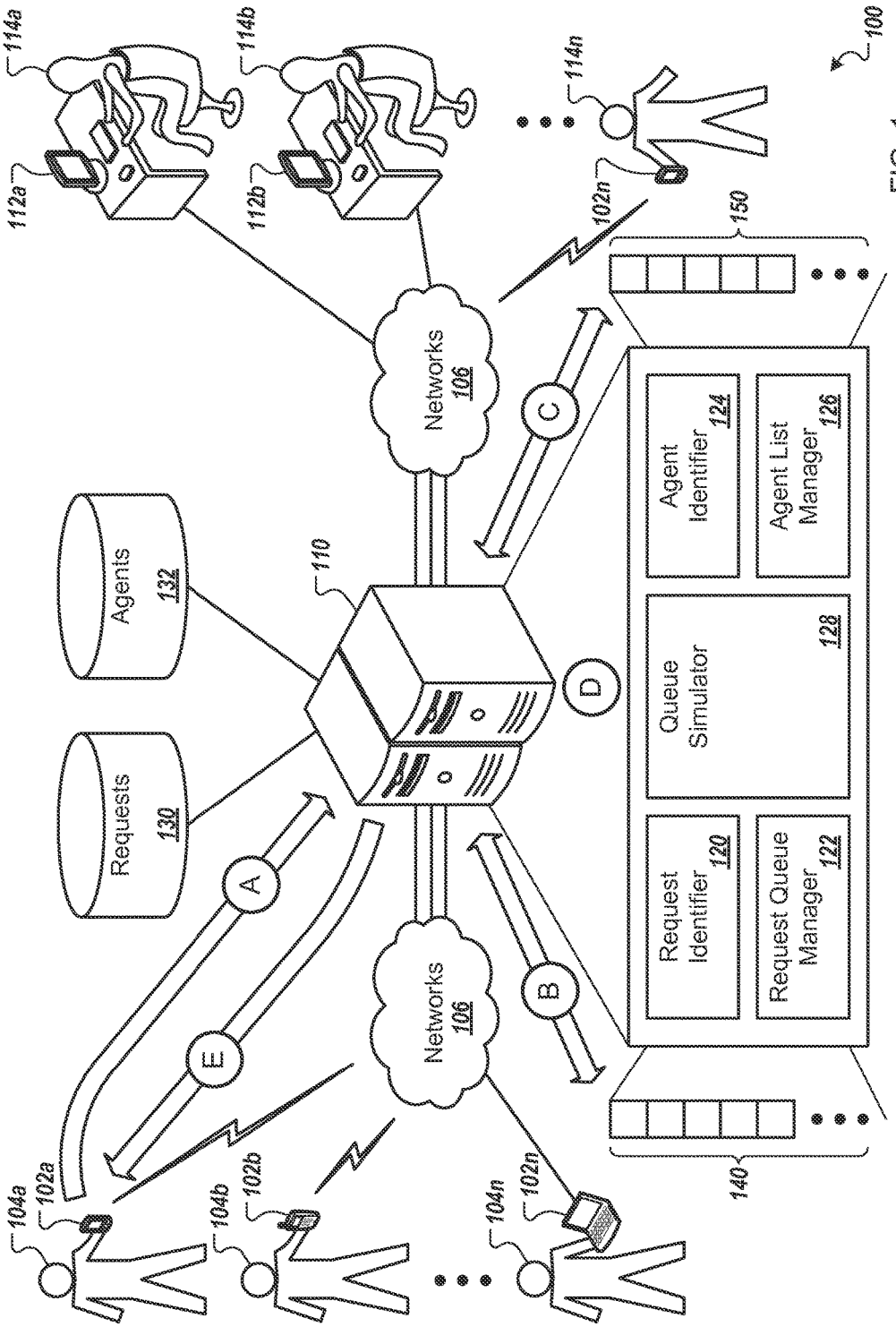

100
114a
114b
114n
112a
112b
102n
150
Networks 106
Agents 132
110
Requests 130
A
B
C
D
E
Agent Identifier 124
Agent List Manager 126
Queue Simulator 128
Request Identifier 120
Request Queue Manager 122
140
104a
102a
104b
102b
104n
102n

FIG. 1

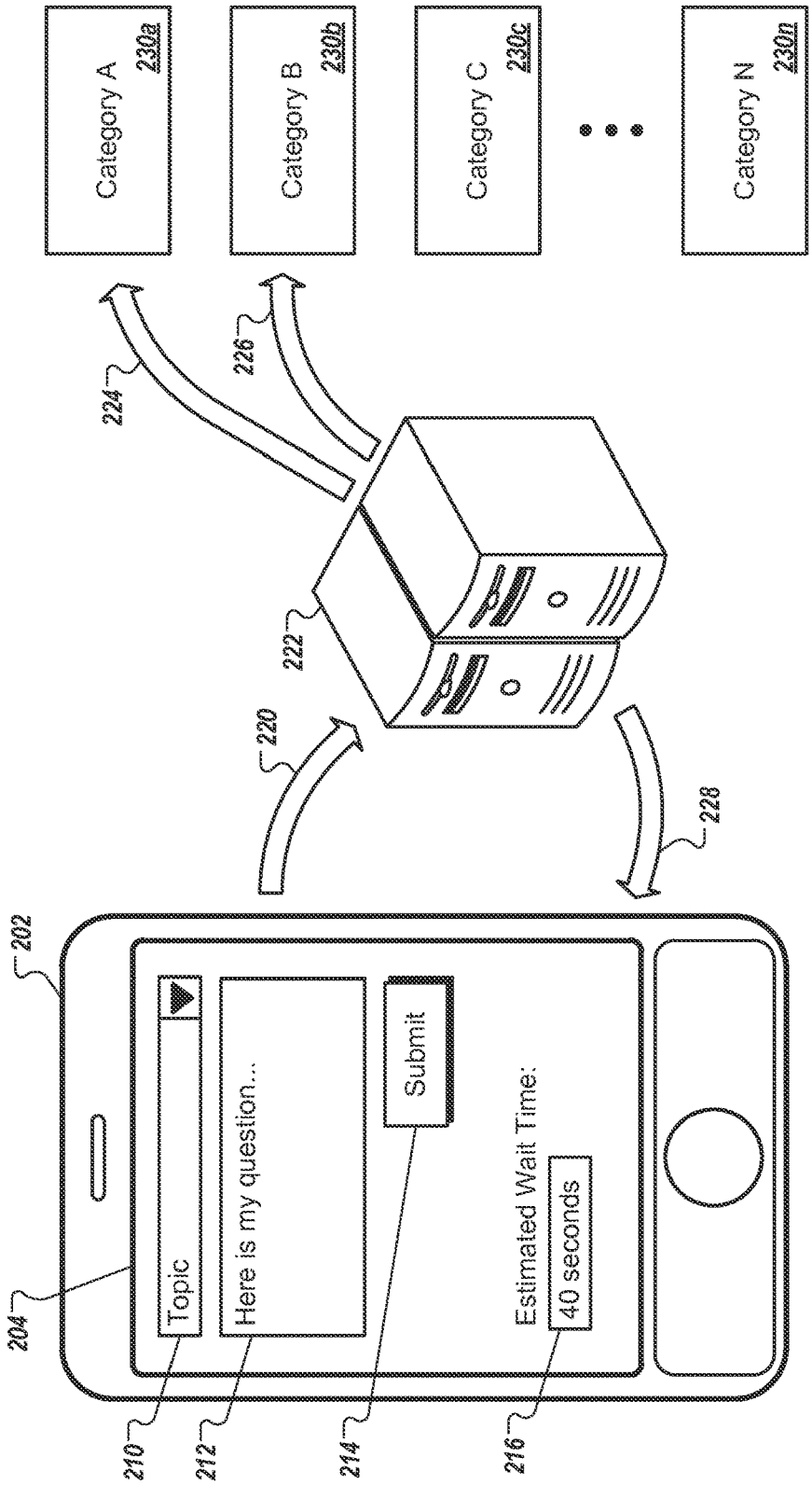

Category A
230a
Category B
230b
Category C
230c
Category N
230n
224
226
222
220
228
202
204
Topic
Here is my question...
Submit
Estimated Wait Time:
40 seconds
210
212
214
216
200

FIG. 2

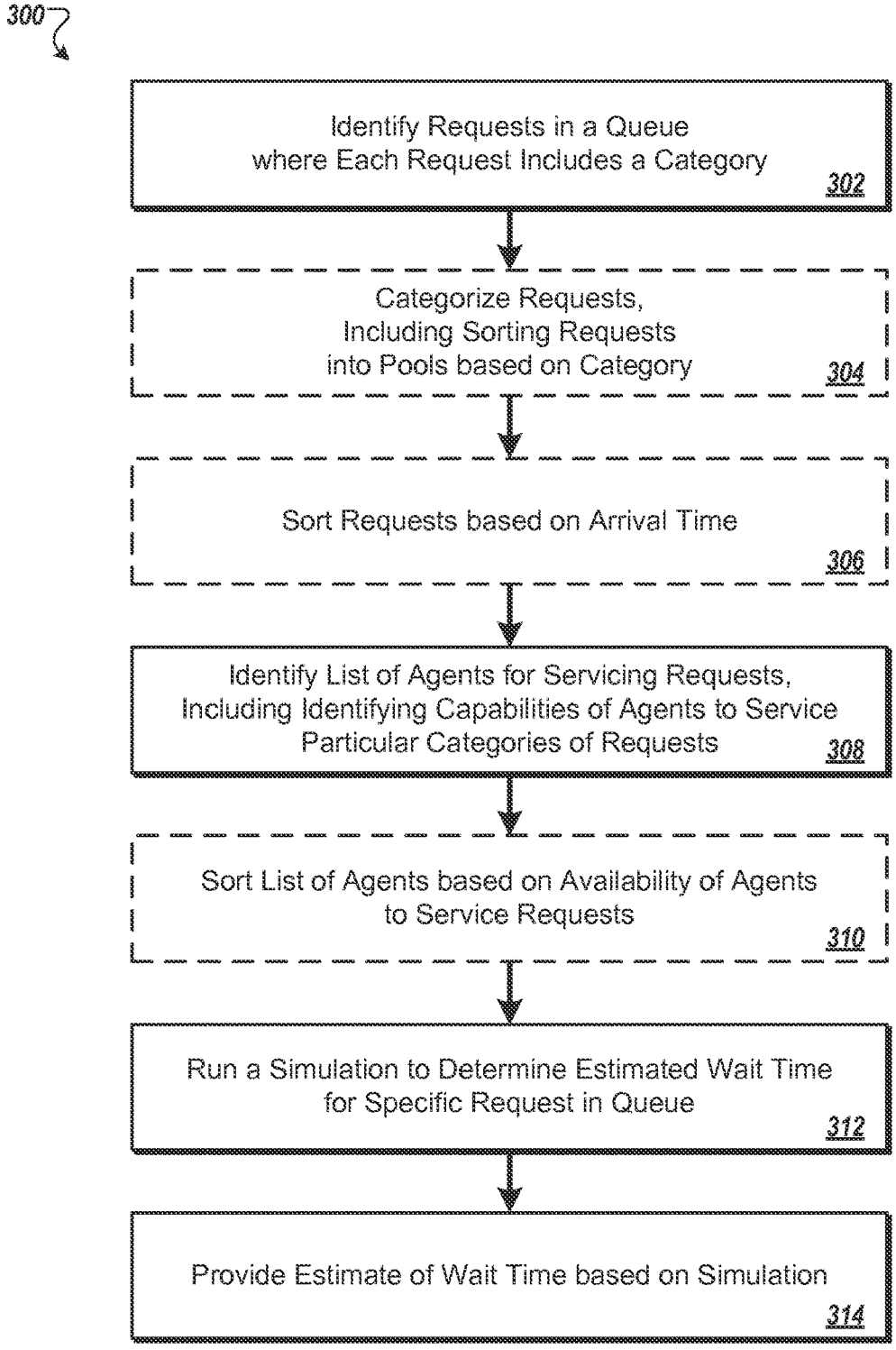

300
Identify Requests in a Queue where Each Request Includes a Category
302
Categorize Requests, Including Sorting Requests into Pools based on Category
304
Sort Requests based on Arrival Time
306
Identify List of Agents for Servicing Requests, Including Identifying Capabilities of Agents to Service Particular Categories of Requests
308
Sort List of Agents based on Availability of Agents to Service Requests
310
Run a Simulation to Determine Estimated Wait Time for Specific Request in Queue
312
Provide Estimate of Wait Time based on Simulation
314

FIG. 3

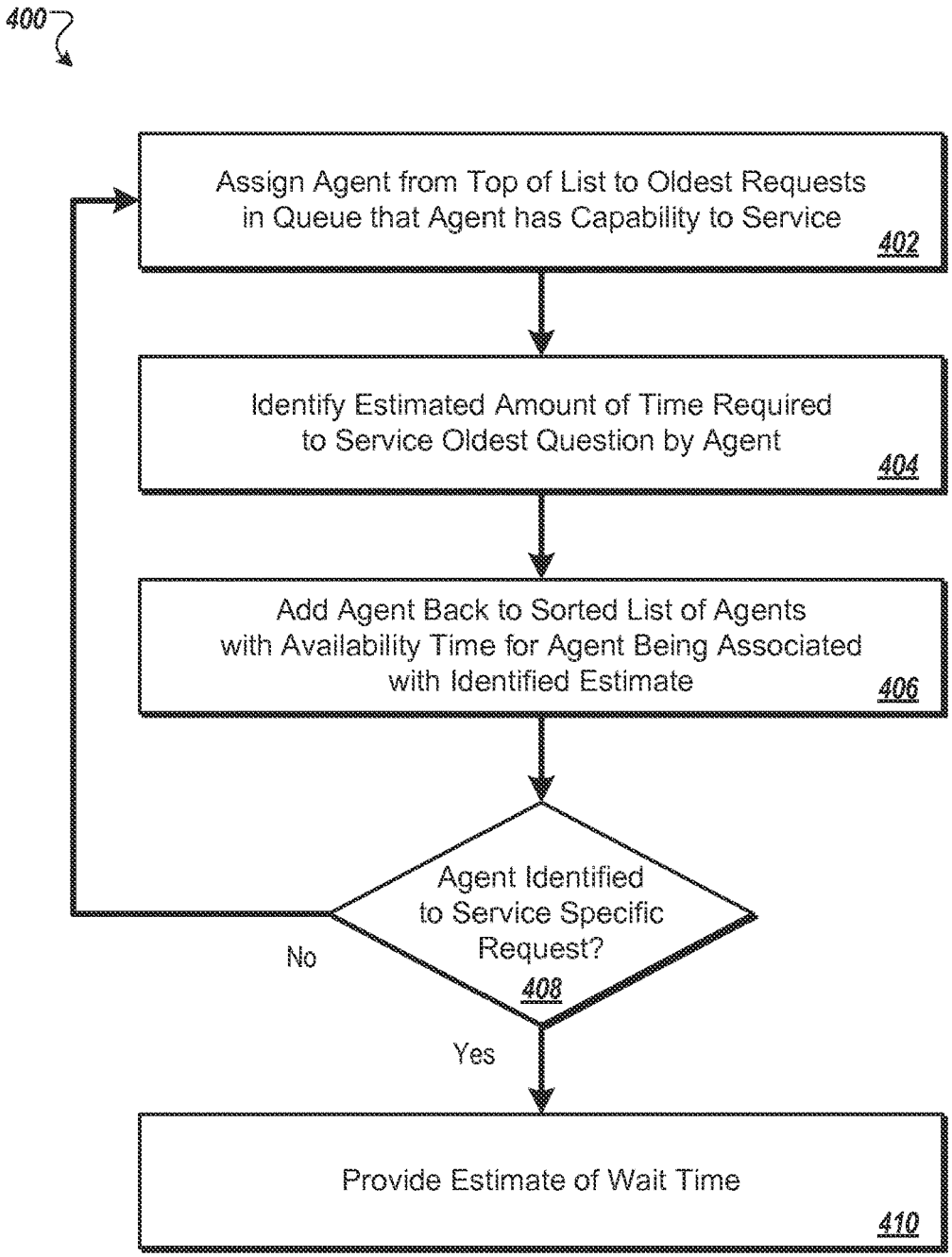

400
Assign Agent from Top of List to Oldest Requests in Queue that Agent has Capability to Service
402
Identify Estimated Amount of Time Required to Service Oldest Question by Agent
404
Add Agent Back to Sorted List of Agents with Availability Time for Agent Being Associated with Identified Estimate
406
Agent Identified to Service Specific Request?
408
No
Yes
Provide Estimate of Wait Time
410

FIG. 4

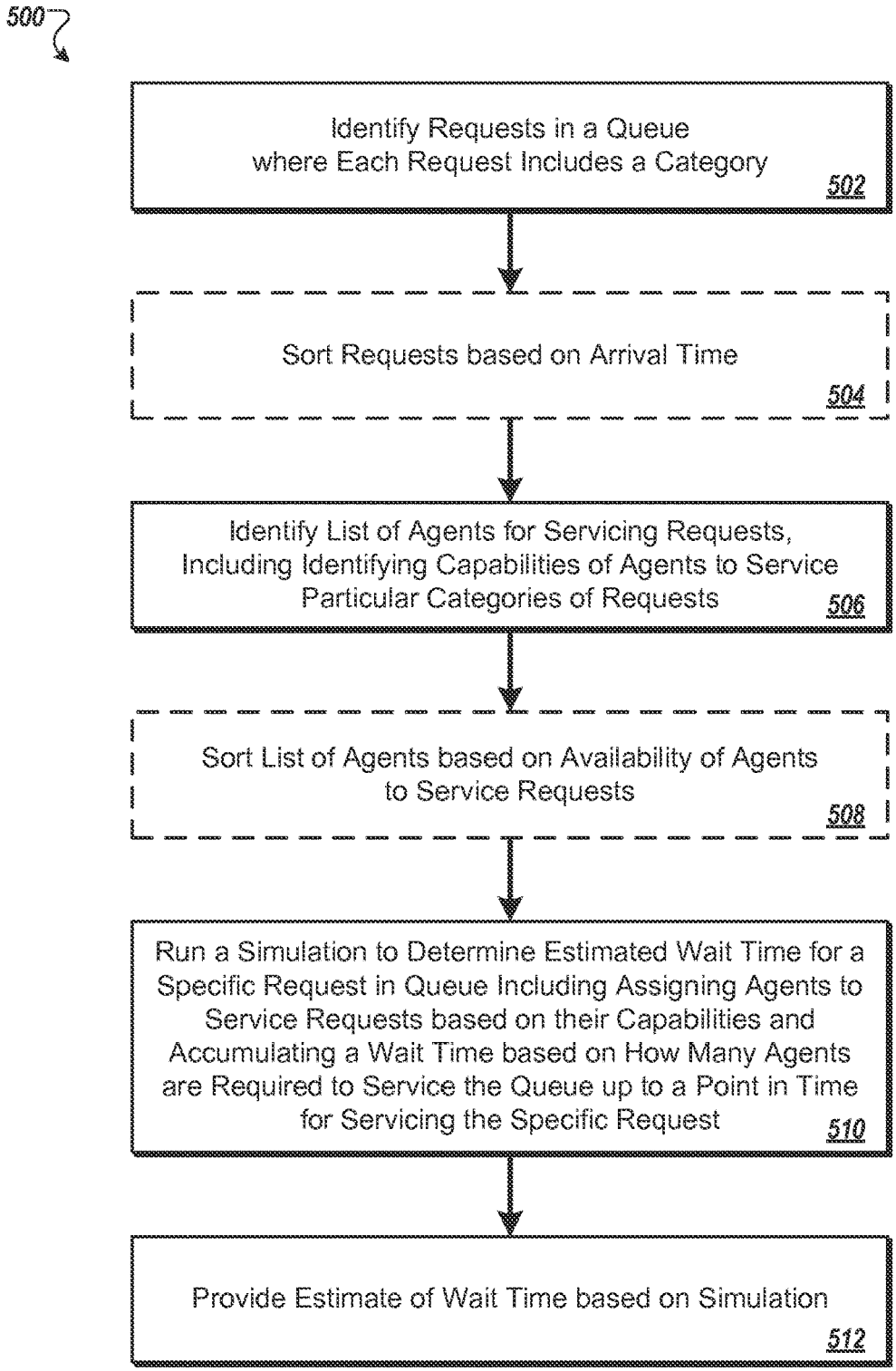

500
Identify Requests in a Queue where Each Request Includes a Category
502
Sort Requests based on Arrival Time
504
Identify List of Agents for Servicing Requests, Including Identifying Capabilities of Agents to Service Particular Categories of Requests
506
Sort List of Agents based on Availability of Agents to Service Requests
508
Run a Simulation to Determine Estimated Wait Time for a Specific Request in Queue Including Assigning Agents to Service Requests based on their Capabilities and Accumulating a Wait Time based on How Many Agents are Required to Service the Queue up to a Point in Time for Servicing the Specific Request
510
Provide Estimate of Wait Time based on Simulation
512

FIG. 5

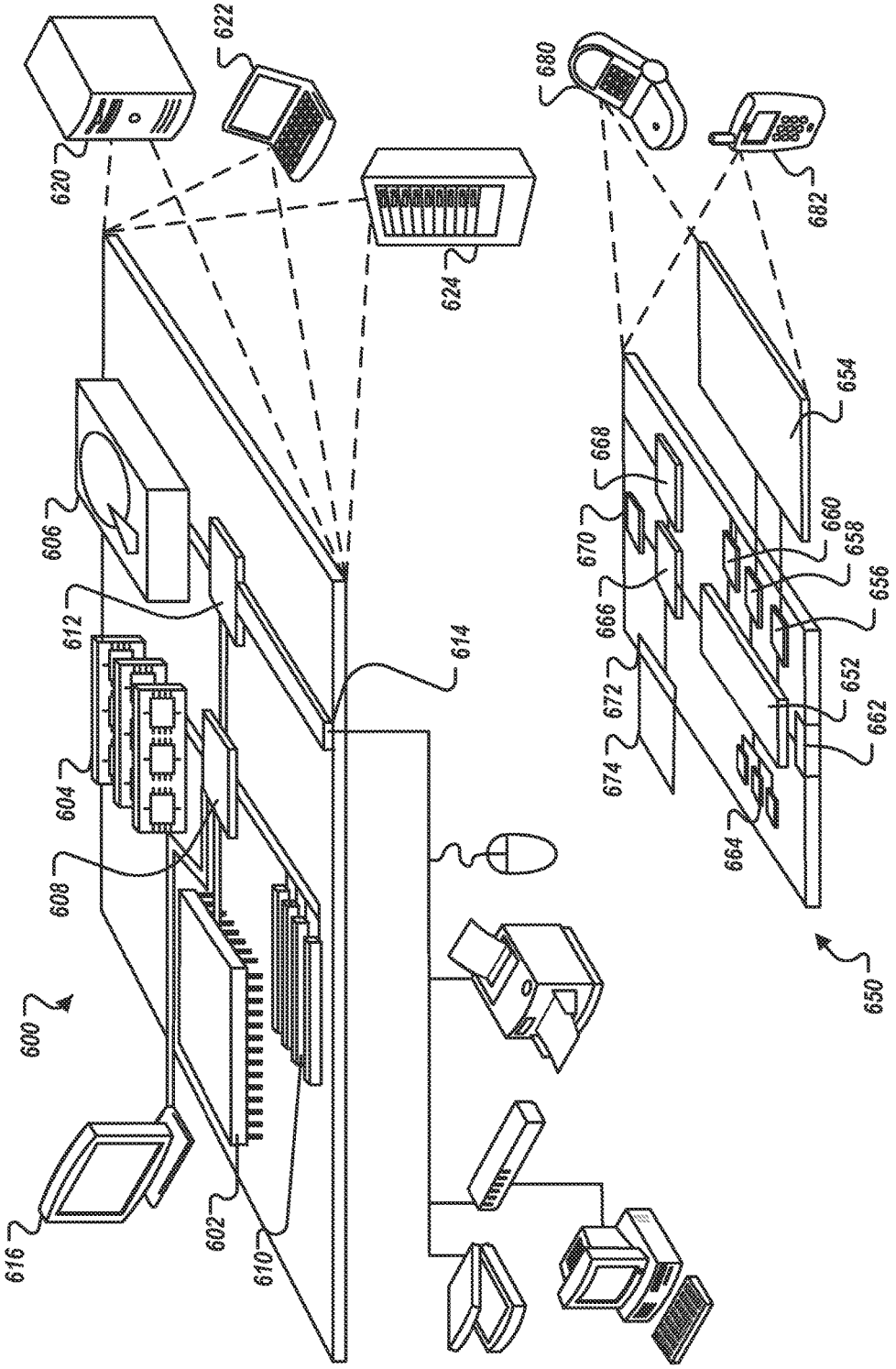

600
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FIG. 6

ESTIMATING WAIT TIMES FOR REQUESTS

BACKGROUND

[0001] This specification generally relates to performing data manipulation.

[0002] Help systems, such as phone-based and Internet-based systems, can match users requesting information or assistance with personnel who may be able to assist the users. If the number of personnel employed by the help system is insufficient for assisting all of the users that request assistance at any one time, the users may be placed in a queue. The users wait their turn before being assigned to an available assistant.

SUMMARY

[0003] In general, one innovative aspect of the subject matter described in this specification may be embodied in methods, systems, and computer program products for estimating wait times for requests. One example method includes identifying requests in a queue where each request includes a category, identifying a list of agents for servicing the requests including identifying capabilities of the agents to service particular request categories, running a simulation to determine an estimated wait time for a specific request in the queue, and providing an estimate of the wait time based on the simulation. The simulation can include assigning agents service requests based on their capabilities and accumulating a wait time based on how many agents are required to service the queue up to a point in time for servicing the specific request.

[0004] In general, another innovative aspect of the subject matter described in this specification may be embodied in methods that include the actions of identifying requests in a queue where each request includes a category, identifying a list of agents for servicing the requests including identifying capabilities of the agents to service particular request categories, and running a simulation to determine an estimated wait time for a specific request in the queue. The simulation can include the steps of assigning an agent from a top of the list to an oldest request in the queue that the agent has a capability to service, identifying an estimated amount of time required to service the oldest request by the agent, adding the agent back to the sorted list of agents with an availability time for the agent being associated with the identified estimate, and repeating the steps until an agent is identified to service the specific request. An estimate of the wait time can be provided based on the simulation.

[0005] These and other embodiments may each optionally include none, one or more of the following features. In various examples, the requests can be questions posed in a chat help queue. The category can include a topic. The category can include a topic and a language. Categorizing the requests based on category can include sorting the requests into a plurality of pools based on the category. The requests can be sorted based on arrival time. Sorting the requests can be based in part on priority of the requests.

[0006] The list of agents can be sorted based on availability of the agents to service requests. An agent's capabilities can be measured in terms of one or more thresholds, and determining a request in the simulation that can be serviced by a given agent can include determining if the agent is sufficiently capable to service the request, where sufficiency is measured based on one or more criteria. The criteria can be a number of other agents in the list that have a minimum capability to service the request. The criteria can be a number of requests of a given type that are in the queue. Agents can be capable of working on a plurality of N requests at one time, and an agent can be added hack to the sorted list of agents with an availability time for the agent being associated with the estimated time/N. Running the simulation can include removing agents from the simulation if they do not have a capability to service any requests in the queue. Running the simulation can include ending the simulation if the list of available agents reaches zero.

[0007] Providing the estimate can include compensating for simulation start up error when providing the estimate. Compensating for simulation start-up error can include adjusting an amount of time of delay in answering a first question by an agent by an amount equal to approximately one half of a historical average. Providing the estimate can include providing an estimate that indicates that no agents are presently available to service the request. Providing the estimate can include determining a number of questions that the agent that has been identified to process the specific request has processed in the simulation prior to being available to process the specific request, and multiplying an average processing time associated with the agent by the number of questions to produce the estimate. Providing the estimate can include maintaining a cumulative total of estimated handling times for requests that the agent that has been identified to process the specific request has processed in the simulation prior to being available to process the specific request. When determining a wait time associated with processing a first request by a given agent, the estimated wait time can be reduced by one half of an average processing time associated with the agent.

[0008] Particular embodiments of the subject matter described in this specification may be implemented to realize none, one or more of the following advantages. Accurate information regarding wait times for requests can be provided to users, taking into account different categories of requests submitted by the users, and different capabilities of agents. Agents in multi-agent environments can be employed effectively and efficiently. Users can receive timely assistance from agents capable of servicing their requests. Wait time estimates can be adjusted for skew in distribution of requests for information with respect to agent capabilities.

[0009] The details of one or more embodiments of the subject matter described in this specification are set forth in the accompanying drawings and the description below. Other potential features, aspects, and advantages of the subject matter will become apparent from the description, the drawings, and the claims.

BRIEF DESCRIPTION OF DRAWINGS

[0010] FIG. **1** is a diagram of an example system that can estimate wait times for requests.

[0011] FIG. **2** is a diagram of an example system that can categorize requests.

[0012] FIG. **3** is a flowchart of an example process for estimating wait times for requests.

[0013] FIG. **4** is a flowchart of an example process for running a simulation to determine estimated wait times.

[0014] FIG. **5** is a flowchart of an example process for estimating wait times for requests.

[0015] FIG. **6** shows an example of a computer device and a mobile computer device that can be used to implement the techniques described here.

[0016] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0017] In general, a system estimates wait times for users that submit requests for information (e.g., questions) to be handled by agents (e.g., support personnel). The requests can be added to a queue, and agents capable of handling the requests can be identified. For example, a request may be associated with one or more categories, and agents having expertise or experience related to the categories can be identified as having a capability to service the request. To estimate user wait times, the system can run a simulation based in part on agent availability, on agent capability, and on historical averages for handling requests. Wait time estimates produced by the simulation can be provided to users.

[0018] FIG. **1** is a diagram of an example system **100** that can estimate wait times for requests. FIG. **1** also illustrates an example flow of data within the system **100** during states (A) to (E), where the states (A) to (E) may occur in the illustrated sequence, or they may occur in a sequence that is different than in the illustrated sequence.

[0019] In further detail, the system **100** includes one or more client computing devices **102** (each operated by a user **104**) which communicates over one or more networks **106** with one or more computing servers **110**. The system **100** also includes one or more client computing devices **112** (each operated by an agent **114**) which communicates aver the network(s) **106** with the computing server(s) **110**. The networks **106** may include a wireless cellular network, a wireless local area network (WLAN) or WiFi network, a Third Generation (3G) or Fourth Generation (4G) mobile telecommunications network, a private network such as an intranet, a public network such as the Internet, or any appropriate combination thereof.

[0020] The client devices **102**, **112** may be any appropriate type of computing device (e.g., mobile phone, smart phone, PDA, music player, e-book reader, tablet computer, laptop or desktop computer, or other stationary or portable device) that includes one or more processors and computer readable media. Among other components, for example, the client devices **102**, **112** include one or more processors, computer readable media that store software applications, input device (s) (e.g., touch screens, keyboards, computer mice, motion sensors and the like), output device(s) (e.g., display screens, speakers, and the like), and communications interfaces.

[0021] The computing server(s) **110** may be configured to execute application code associated with a variety of software components (e.g., modules, objects, libraries, services, and the like) including a request identifier **120**, a request queue manager **122**, an agent identifier **124**, an agent list manager **126**, and a queue simulator **128**. Two or more of the components **120**, **122**, **124**, **126**, and **128** may be implemented on the same computing device, or on different computing devices, such as devices included in a server farm or a peer-to-peer network.

[0022] The computing server(s) **110** may be configured to access and maintain data stored by a requests data store **130** and an agents data store **132**. For example, the requests data store **130** can be used to maintain data related to requests for information submitted by the users **104**, including information related to question types and categories. The agents data store **132**, for example, can be used to maintain data related to the agents **114**, including information related to agent capabilities and agent processing of requests for information.

[0023] Referring to the example flow of data, during state (A), the user **104***a* employs the client device **102***a* to submit a request. For example, the request may include a question to be handled by support personnel. The computing server **110** can receive the request and can add the request to a request queue **140**. For example, the request queue **140** can be maintained using static and/or dynamic memory structures managed by the computing server(s) **110**.

[0024] During state (B), the computing server(s) **110** can identify requests submitted by the users **104**. For example, the computing server(s) **110** can use the request identifier **120** to identify the request in the request queue **140** submitted by the user **104***a*. In some implementations, users may provide category information (e.g., topics, subjects, languages) with the requests. For example, the users **104** can provide category information using one or more configuration interfaces. In some implementations, the computing server(s) **110** may derive category information from the submitted requests. For example, the request identifier **120** can parse text included in the request submitted by the user **104***a* to identify keyword information, and the keyword information can be referenced (e.g., against request information provided by the requests data store **130**) to identify one or more categories related to the request. As another example, text can be parsed to identify the preferred language of the user **104***a*.

[0025] The computing server(s) **110** can use the request queue manager **122** to sort requests based on arrival time. In the present example, as the computing server(s) **110** may have received a request from the user **104***a* after receiving requests from other users **104**, the request queue manager **122** may place the request from the user **104***a* at the end of the request queue **140**. As other users **104** submit additional requests, for example, the request queue manager **122** may similarly add such requests to the end of the queue **140**. As requests are handled by agents **114**, for example, the request queue manager **122** may remove the handled requests from the queue **140**. If a particular user **104** were to cancel his or her request, for example, the request queue manager **122** may remove the canceled request from the queue **140**.

[0026] During state (C), the computing server(s) **110** can identify agents **114** for servicing the requests, and can determine agent availability. For example, the computing server(s) **110** can use the agent identifier **124** to identify agents **114** in an agent list **150**. The agent list **150** can be maintained using static and/or dynamic memory structures managed by the computing server(s) **110**, for example. Identifying the list of agents can include identifying one or more capabilities for the agents **114** to service particular categories of requests. For example, the agents **114** may have different areas of expertise, different user interaction skills, different language skills, different authority levels, and so forth. In some implementations, the agents **114** may be associated with a particular organization (e.g., employees or representatives of business). In some implementations, the agents **114** may be part of a community of users (e.g., some or all of the users **104** may also be agents **114**). Information related to the capabilities of the agents **114** can

be maintained by the agents data store **132**, and can be used by the agent identifier **124** for identifying agents.

[0027] The computing server(s) **110** can use the agent list manager to sort the agents **114** based on the ability to service requests. For example, idle agents may be placed at or near the top of the agent list **150**. Occupied agents may be sorted by the agent list manager **126** further down the agent list **150**, for example, based on projected availability. For example, information maintained by the agents data store **132** may be provided to agent list manager **126** for determining availability of each of the agents **114** in the agent list **150**. As agents **114** become available to handle user requests (e.g., as they log into the system **100**), the agent list manager **126** may add the agents to the agent list **150**. As the agents **114** become unavailable (e.g., as they log out), the agent list manager **126** may remove the agents from the agent list **150**.

[0028] During state (D), the computing server(s) **110** can run a simulation to determine wait times for user requests. For example, the computing server(s) **110** can use the queue simulator **128** to determine an estimated wait time for the request in the request queue **140** submitted by the user **104***a*. Generally, the simulation can include assigning the agent at the top of the agent list **150** to the oldest request in the request queue **140** that the agent has a capability to service. The amount of time required to service the request can be estimated, and the agent can be added back to the agent list with an availability time associated with the estimate. The process may be repeated until an agent is identified to service a specific request.

[0029] During state (E), the computing server(s) **110** can provide an estimate of the wait time based on the simulation. For example, the computing server(s) **110** can provide to the client device **102***a* information associated with the estimated wait time for a response to the request submitted by the user **104***a*. The client device **102***a* can present such information to the user **104***a*, for example, through a visual and/or audio interface. In some implementations, the information may be updated periodically. For example, one or more other users **104** with requests higher in the request queue **140** relative to the request submitted by the user **104***a* may cancel their requests before receiving assistance from one or more agents **114**, and the queue simulator **128** may recalculate an estimated wait time for the user **104***a* to take the cancellations into account. As another possibility, one or more agents **114** may log in or log out of the system **100** before the request submitted by the user **104***a* is handled. Thus, the queue simulator **128** can adjust the simulation to recalculate estimated wait times for the users **104** as conditions change, and can provide the recalculated wait times to the users.

[0030] By running simulations, for example, the computing server(s) **110** in the system **100** can provide the users **104** with accurate information regarding wait times for requests, while taking into account different categories of requests submitted by the users, and different capabilities of the agents **114**.

[0031] FIG. **2** is a diagram of an example system **200** that can categorize requests. In some implementations, the system **200** may be included in or may be in communication with the system **100** (shown in FIG. **1**). For example, the computing server(s) **110** can be configured to categorize requests or to receive categorization information.

[0032] The system **200** includes a client computing device **202**. Similar to client devices **102**, **112** (shown in FIG. **1**), for example, the client computing device **202** may be any appropriate type of computing device that includes one or more processors and computer readable media. The client device **202** includes an interface **204** that can enable a device user to submit requests (e.g., questions) for handling by one or more agents. For example, the interface **204** can include visual, audio and tactile sensors, controls, and feedback mechanisms.

[0033] In some implementations, the interface **204** can include a topic control **210** and/or a request control **212**. For example, the topic control **210** can include a list of request topics selectable by the device user. The user can employ the request control **212** to enter a particular request for information, for example, using one or more text or voice input devices. Upon selecting a topic and/or entering the request, for example, the user can submit topic and request information by interacting with a submission control **214**.

[0034] As shown by arrow **220**, the topic and/or request can be received by computing server(s) **222**. Similar to computing server **110** (shown in FIG. **1**), for example, the computing server(s) **222** may be configured to execute application code associated with a variety of software components for identifying and categorizing requests, identifying agent capabilities, and providing estimated wait times for requests. The computing server(s) **222** may determine that the topic and/or request submitted by the user relates to one or more categories. In the present example, as shown by arrows **224**, **226**, the computing server(s) **222** may identify relationships between the submitted topic and/or request and categories **230***a* and **230***b*.

[0035] In some implementations, categories may include topic information. For example, the categories **230** may relate to general classes of products, services, or problems and the list of topics selectable by the user through the topic control **210** may include various subclasses of the general classes. The computing server(s) **222** can include a mechanism (e.g., a mapping function) for relating specific topics to general categories. As another example, a category may be associated with a list of related keywords. For example, request information submitted by the user through the request control **212** can be analyzed by the computing server(s) **222**, and the request information can be mapped to one or more categories **230** using the list of keywords.

[0036] In some implementations, categories may include topics and languages For example, categories **230***a*, **230***b*, and **230***c* may each be associated with a similar class of products, services, or problems, but with different languages. It may be determined by the computing server(s) **222**, for example, that the user of the device **202** has submitted a topic and/or request related to a particular category, end that the user has a preference for one or more languages. For example, topic and/or request information submitted by the user can be analyzed to identify language preferences. As another example, language preferences may be directly provided by the user.

[0037] The computing server(s) **222** can identify one or more agents for servicing the user request. In the present example, the computing server(s) **222** can identify the capabilities of one or more agents to service the categories **230***a*, **230***b*, the agents can be sorted, and a simulation can be run to determine an estimated wait time for the request. As shown by arrow **228**, the wait time estimate is provided to the client device **202**, and information associated with the estimate is presented to the user through an estimate reporting control **216**.

[0038] FIG. **3** is a flowchart of an example process **300** for estimating wait times for requests. In some implementations, the process **300** may be performed by the system **100**, and will be described as such for purposes of clarity. Briefly, the process **300** includes identifying requests in a queue, categorizing requests, sorting requests based on arrival time, identifying agents for servicing requests, sorting agents based on availability, running a simulation to determine estimated wait times, and providing estimated wait times.

[0039] In more detail, a plurality of requests in a queue can be identified (**302**), where each request includes a category. For example, the request identifier **120** can identify requests in the request queue **140** submitted by the users **104**. In some implementations, the requests may be questions posed in a chat help queue. For example, the user **104***a* can use client device **102***a* to submit a question to be handled by one or more of the agents **114** through an Internet chat dialog. In the event that a capable agent **104** is not immediately available, for example, the computing server(s) can run a simulation to determine an estimated wait time for the user **104***a*, and can provide information associated with the wait time for presentation to the user via the client device **102***a*.

[0040] In some implementations, the category may include a topic. For example, the user **104***a* can specify that the request pertains to troubleshooting a technical problem with a particular product (e.g., a camera). In the present example, the category may be associated with the product or product class (e.g., the particular type of camera, or cameras in general), and the topic may be relative to the category (e.g., troubleshooting a technical problem with the camera). In some implementations, the category may include a topic and a language. For example, the category can include a topic relative to the category for a particular language, such as troubleshooting a technical problem with the camera in English.

[0041] In some implementations, requests may be categorized (**304**). As shown in FIG. **2**, for example, categorizing requests can include sorting the requests into a plurality of pools based on the category. For example, using request, topic and/or language information, the computing server(s) **110** (shown in FIG. **1**) can associate a particular request with one or more categories.

[0042] In some implementations, requests may be sorted (**306**), based on arrival time. For example, the request queue manager **122** can sort requests in the request queue **140** based on the order received by the computing server(s) **110**. As additional requests are submitted by the users **104**, for example, the requests can be added to the end of the request queue **140**. As requests are handled by the agents **114**, for example, the requests can be removed from the request queue **140**. In some implementations, the request queue manager **122** can manage multiple request queue copies. For example, a simulation for estimating wait time for a particular request can use a copy of the request queue **140**.

[0043] A list of agents for servicing the requests can be identified (**308**), including identifying one or more capabilities of the agents to service particular categories of requests. For example, the agent identifier **124** can access the agents data store **132** to identify capabilities of the agents **114**. In the present example, the agent identifier **124** may determine that the agents **114***a*, **114***b* have various capabilities, including the capability to handle questions related to troubleshooting technical problems with cameras, and the capability to communicate in English. Thus, both agents **114***a*, **114***b* may be identified as having the capability to service such categories of requests as "troubleshooting technical problems", "cameras", "troubleshooting technical problems with cameras", and "troubleshooting technical problems with cameras in English", depending on the granularity of the request categorization. Additional agent(s) **114***n*, for example, may or may not be identified as having the capability to service such categories of requests. However, agent(s) **114***n* may have the capability to service other request categories, potentially freeing one or more agents **114***a*, **114***b* to handle the troubleshooting problem of the present example.

[0044] In some implementations, the list of agents may be sorted (**310**), based on the availability of the agents to service requests. For example, the agent list manager **126** can add agents **114** to the agent list **150** (e.g., an array, a list, or another sort of data structure), and can sort the agent list **150** based on agent availability. In the present example, the agent list manager **126** may determine that the agent **114***a* is currently available (e.g., is not currently handling a user request), and may determine that the agent **114***b* is currently occupied. Thus, the agent list manager **126** may sort the agents **114***a*, **114***b*, such that agent **114***a* is placed at the top of the agent list **150**, and the agent **114***b* is placed further down the agent list **150**. As the availability of the agents **114** to handle requests changes (e.g., as agents log in or out of the system **100**, as agents are assigned requests, as agents handle requests, as the efficiency of request handling by agents increases or decreases), the agent list manager **126** may re-sort the agent list **150** to reflect the changes. In some implementations, the agent list manager **126** can manage multiple agent list copies. For example, a simulation for estimating wait time for a particular request can use a copy of the agent list **150**.

[0045] A simulation can be run (**312**) to determine an estimated wait time for a specific request. In general, the simulation can include assigning agents to service requests based at least in part on capabilities of the agents. An example simulation process is shown in FIG. **4**, and will be discussed in further detail below.

[0046] In some implementations, an agent's capabilities may be measured in terms of one or more thresholds, and determining in the simulation whether a particular request can be serviced by a given agent can include determining if the agent is sufficiently capable to service the request. For example, the agent identifier **124** can access the agents data store **132** to identify capabilities of each of the agents **114**, and can provide such information to the queue simulator **128**. The request identifier **120**, for example, can identify category, topic, and language information associated with requests submitted by the users **104**, and can provide such information to the queue simulator **128**. Based on provided information, for example, the queue simulator **128** can match user requests to sufficiently capable agents.

[0047] Sufficiency of agent capabilities may be measured based on one or more criteria. In some implementations, the criteria may include a number of other agents in the list of agents that have a minimum capability to service the request. For example, if the request submitted by user **104***a* is categorized as "troubleshooting technical problems with cameras in English", the queue simulator **128** may initially identify a subset of the agents **114** (e.g., agents **114***a*, **114***b*) in the agent list **150** as being sufficiently capable to handle the request. In the present example, if the criterion for the

number of agents is configured to include a greater number of agents, the threshold for agent capability can be lowered to include agents that are capable in regard to such general categories as "troubleshooting technical problems" or "cameras". As another example, certain agents may be identified as being more or less capable of handling requests of a particular type. If the queue simulator **128** initially identities a greater number of agents **114** in the agent list **150** than the criterion for the number of agents, for example, the threshold for agent capability can be raised such that a lesser number of agents are included. For example, agents may be selected based on an amount of experience handling the type of request, based on an efficiency level, based on an authority level, or some other qualifier.

[0048] In some implementations, the criteria may include a number of requests of a given type that are in the queue. For example, if the queue simulator **128** determines that a number of requests related to "troubleshooting technical problems" in the request queue **140** is greater than a certain level, a threshold for measuring an agent's capabilities may be lowered such that the number of agents **114** identified as being sufficiently capable of handling the type of request increases. Correspondingly, if the number of requests is less than a certain level, the threshold may be raised such the number of identified agents **114** decreases. Thus, by considering the number of agents **114** in the agent list **150**, and the number of requests of a given type in the request queue **140**, thresholds for measuring agent capabilities can be adjusted by the queue simulator **128** to dynamically balance available agents with user requests.

[0049] An estimate of wait time can be provided (**314**) based on the simulation. In the present example, the queue simulator **128** may determine that the agent **114***a* is capable of servicing a request of the user **104***a,* and that the agent will be available at a particular time. Information related to the wait time estimate can be provided by the computing server(s) **110** to the user client device **102***a* and can be presented to the user **104***a.*

[0050] FIG. **4** is a flowchart of an example process **400** for running a simulation to determine estimated wait times. In some implementations, the process **400** may be performed by the queue simulator **128** in the system **100** (shown in FIG. **1**), and will be described as such for purposes of clarity. Briefly, the process **400** includes assigning an agent from the top of a list of agents to an oldest request in a request queue that the agent has a capability to service. An estimated amount of time required to service the oldest request can be identified, and the agent can be added back to the sorted agent list with an availability time for the agent being associated with the estimate. The steps may be repeated until a particular agent is identified to service the specific request. Upon identifying the agent, an estimate of wait time may be provided.

[0051] In more detail, an agent from the top of a list of agents is assigned (**402**) to an oldest request in a request queue that the agent has a capability to service. For example, the agent **114***a* may be currently available, and may be positioned at the top of the agent list **150**. The queue simulator **128**, for example, can traverse from the top of the request queue **140** toward the bottom, and can determine whether the agent **114***a* is capable of servicing each of the requests. When a match between a particular request (e.g., based on category) and the capabilities of the agent **114***a* is identified, for example, the queue simulator **128** can assign the agent **114***a* to the request.

[0052] In some implementations, running the simulation may include removing agents from the simulation if they do not have a capability to service any requests in the queue. For example, if the queue simulator **128** were to determine that the agent **114***a* does not have the capability to service any of the requests in the request queue **140**, the agent **114***a* may be removed from the simulation. In some implementations, as additional requests are added to the request queue **140**, the queue simulator **128** may again include the agent **114***a* in the simulation. For example, if sorting of requests is based at least in part on priority, additional requests may affect simulation results.

[0053] An estimated amount of time required to service the oldest request by the agent is identified (**404**). For example, the queue simulator **128** can access the requests data store **130** and/or the agents data store **132** to identify historical data related to handling of similar (e.g., based on category) requests by the agent **114***a.* A historical average of the amount of time spent by the agent **114***a* handling similar requests can be used to estimate the amount of time required to service the request.

[0054] In some implementations, providing the estimate may include compensating for simulation start up error. For example, when beginning the simulation, the queue simulator **128** may determine that the agent **114***a* is currently handling a user question. To compensate, the queue simulator **128** may adjust an amount of time of delay in answering a first question by the agent **114***a* by a predetermined amount. In some implementations, the predetermined amount is equal to approximately one half of a historical average. For example, the queue simulator **128** can access the agents data store **132** to identify historical data related to handling of past requests by the agent **114***a,* and can use the data to calculate an average amount of time for servicing requests. The average amount of time divided by two for servicing requests can be added to the estimated amount of time required to answer a first question by agent in the simulation.

[0055] The agent is added (**406**) back to the sorted list of agents with an availability time for the agent being associated with the identified estimate. For example, each of the agents **114** in the agent list **150** can be associated with an estimated time of availability, based on cumulative estimated times for servicing assigned requests. If the agent **114***a* is initially positioned at the top of the agent fist **150**, for example, the queue simulator **128** can remove the agent from the top position, and can use the estimated amount of time for answering a question by the agent to insert the agent **114***a* at a different position in the agent list **150**. To sort the agent list **150**, the queue simulator **128** can compare the estimated availability times for the agents **114**. Thus, as agents **114** from the agents list **150** are assigned to requests by the queue simulator **128**, their relative positions in the agents list **150** may change.

[0056] In some implementations, agents may be capable of working on a plurality of N requests at one time, and may be added back to the sorted list of agents with an availability time for the agent being associated with the estimated time/N. For example, the agent **114***a* may have the capability to process multiple requests at a time (e.g., by using multiple chat windows, texting sessions, or e-mail exchanges). To account for increased agent efficiency, for example, the

queue simulator **128** can identify an estimated amount of time for servicing each request assigned to the agent **114***a*, and can divide the estimated amount of time for each request by the number of requests that the agent is capable of servicing. The modified time estimate for each assigned request can be accumulated by the queue simulator **128**, and can be used for sorting the agent **114***a* in the agent list **150**.

[0057] A determination (**408**) is made of whether an agent is identified to service a specific request. For example, if the queue simulator **128** is to provide a wait time estimate for the request at a specific position in request queue **140**, multiple iterations of steps **402**, **404**, **406** in the process **400** may or may not be necessary for identifying an agent to service the request. If the agent at the top of the agent list **150** is determined to be capable of servicing the request, for example, the estimated wait time for the request may correspond with the availability time of the agent. If the agent at the top of the agent list **150** is determined to be incapable of servicing the request, for example, the next agent is identified as a possibility, and so forth. In some implementations, the simulation may be ended if the list of available agents reaches zero. For example if all of the agents **114** log out of the system **100**, the queue simulator **128** may end the simulation. As another example, if the queue simulator **128** is unable to identify an agent **114** capable of handling a particular request, the queue simulator **128** may end the simulation for that request until additional agents log in to the system **100**.

[0058] An estimate of wait time is provided (**410**) based on the simulation. For example, the queue simulator **128** can provide wait time estimates for each of the requests in the request list **140**, and the computing server(s) **110** may provide estimate information to the users **104**. The wait time estimate for a request may correspond with the availability time of a particular agent when the queue simulator **128** assigns the agent to a specific request. For an initially unoccupied agent, for example, a wait time estimate for a first request assigned to the agent may be zero. For the second request assigned to the agent, the estimated wait time may be based on the estimated time for the agent to service the first request. For the third request assigned to the agent, the estimated wait time may be based on the estimated time for the agent to service the first two requests, and so forth.

[0059] In some implementations, providing the estimate can include providing an estimate that indicates that no agents are presently available to service the request. For example, if none of the agents **114** are identified by the queue simulator **128** as having the capability to service a request submitted by the user **104***b* (e.g., the request is submitted in a language in which none of the agents are proficient), the user **104***b* may be notified of such a condition.

[0060] In some implementations, providing the estimate may include determining a number of requests that the identified agent has processed in the simulation prior to being available to process the specific request, and multiplying an average processing time associated with the agent by the number of requests to produce the estimate. For example, the queue simulator **128** may assign the agent **114***a* to three requests (e.g., questions) before assigning the agent to a specific request. In the present example, the queue simulator **128** can access the requests data store **130** and/or the agents data store **132** to identify an average processing time associated with the agent **114***a*, and may multiply the average processing time by three to produce an estimated wait time for the specific request.

[0061] In some implementations, providing the estimate may include maintaining a cumulative total of estimated handling times for requests that the identified agent has processed in the simulation prior to being available to process the specific request. For example, the queue simulator **128** may assign the agent **114***a* to three requests (e.g., questions) before assigning the agent to a specific request. In the present example, the queue simulator **128** can access the request data store **130** and/or the agents data store **132** to identify projected processing times (e.g., based on category) for each of the three requests, and can accumulate the projected processing times to produce an estimated wait time for the specific request.

[0062] In some implementations, the estimated wait time may be reduced by one half of an average processing time associated with the agent when determining a wait time associated with processing a first request by a given agent. For example, if the agent **114***a* is handling a request when the simulation begins, the queue simulator **128** can divide the average processing time of the agent **114***a* by two in order to produce an estimated wait time for the first request assigned to the agent. Thus, the estimated time for the agent **114***a* to handle an initial ongoing request can be added at the beginning of a simulation, for example, when estimating wait times for subsequent requests.

[0063] FIG. **5** is a flowchart of an example process **500** for estimating wait times for requests. In some implementations, the process **500** may be performed by the system **100**, and will be described as such for clarity. Briefly, the process **500** includes identifying requests in a queue, sorting the requests, identifying a list of agents for servicing the requests, sorting the list of agents based on agent availability, running a simulation to determine estimated wait time for a specific request, and providing an estimate of the wait time.

[0064] A plurality of requests in a queue can be identified (**502**). In some implementations, each request may include a category. For example, the request identifier **120** can identify requests submitted by the users **104** (e.g., using client devices **102**) in the request queue **140**. Each of the requests may be associated with category, topic, and/or language information.

[0065] In some implementations, the requests may be sorted (**504**) based on arrival time. For example, as requests are received by the computing server(s) **110**, the request queue manager **122** can add the requests to the end of the request queue **140**. As requests are handled by agents **114**, for example, the requests queue manager **122** can remove the requests from the queue **140**.

[0066] In some implementations, the requests may be sorted based et least in part on priority. For example, one or more of the users **104** may have a service agreement with an organization (e.g., a business) managing the agents **114**. Requests from preferred users **104**, for example, may receive priority from the computing server(s) **110** when assigning the requests to agents **114**.

[0067] A list of agents can be identified (**506**) for servicing the requests. In some implementations, the identifying may include identifying one or more capabilities of the agents to service particular categories of requests. For example, the agent identifier **124** can identify agents **114** in the agent list **150**, and can identify agent capabilities by referencing the agents data store **132**.

[0068] In some implementations, the list of agents may be sorted (**508**) based on the availability of the agents to service requests. For example, the agent list manager **126** can sort the agent list **150** based on availability of each of the agents **114**. The agent list manager **126** may consider factors including availability times of the agents, ability of the agents to handle multiple requests concurrently, ability of the agents to handle particular categories of requests, experience levels of the agents and/or efficiency levels of the agents, when sorting the agent list **150**.

[0069] A simulation can be run (**510**) to determine estimated wait time for a specific request. For example, the queue simulator **128** can run the simulation for a specific request in the request queue **140**. The simulation can include assigning agents to service requests based on their capabilities and accumulating a wait time based on how many agents are required to service the queue up to a point in time for servicing the specific request. For example, the queue simulator **128** can progressively assign agents **114** to user requests, based on the capabilities of the agents **114**. In general, estimated wait times for requests may be based on the accumulated wait times for the agents required to service the queue. The estimated wait time for the specific request, for example, may be associated with the accumulated wait time for the agent eventually assigned to the request. In some implementations, estimated wait times may be based in part on request priority. For example, requests from preferred users **104** (e.g., users having a service level agreement) may be promoted to the front of the request queue **140**, or may receive an improved position in the queue (e.g., moved toward the front).

[0070] An estimate of the wait time can be provided (**512**), based on the simulation. For example, the computing server (s) **110** may provide estimated wait time information to the client devices **102**, for presentation to the users **104**.

[0071] FIG. **6** shows an example of a generic computer device **600** and a generic mobile computer device **650**, which may be used with the techniques described here. Computing device **600** is intended to represent various forms of digital computers, such as laptops, desktops, workstations, personal digital assistants, servers, blade servers, mainframes, and other appropriate computers. Computing device **650** is intended to represent various forms of mobile devices, such as personal digital assistants, cellular telephones, smartphones, and other similar computing devices. The components shown here, their connections and relationships, and their functions, are meant to be exemplary only, and are not meant to limit implementations of the inventions described and/or claimed in this document.

[0072] Computing device **600** includes a processor **602**, memory **604**, a storage device **606**, a high-speed interface **608** connecting to memory **604** and high-speed expansion ports **610**, and a low speed interface **612** connecting to low speed bus **614** and storage device **606**. Each of the components **602**, **604**, **606**, **608**, **610**, and **612**, are interconnected using various busses, and may be mounted on a common motherboard or in other manners as appropriate. The processor **602** can process instructions for execution within the computing device **600**, including instructions stored in the memory **604** or on the storage device **606** to display graphical information for a GUI on an external input/output device, such as display **616** coupled to high speed interface **608**. In other implementations, multiple processors and/or multiple buses may be used, as appropriate, along with multiple memories and types of memory. Also, multiple computing devices **600** may be connected, with each device providing portions of the necessary operations (e.g., as a server bank, a group of blade servers, or a multi-processor system).

[0073] The memory **604** stores information within the computing device **600**. In one implementation, the memory **604** is a volatile memory unit or units. In another implementation, the memory **604** is a non-volatile memory unit or units. The memory **604** may also be another form of computer-readable medium, such as a magnetic or optical disk.

[0074] The storage device **606** is capable of providing mass storage for the computing device **600**. In one implementation, the storage device **606** may be or contain a computer-readable medium, such as a floppy disk device, a hard disk device, an optical disk device, or a tape device, a flash memory or other similar solid state memory device, or an array of devices, including devices in a storage area network or other configurations. A computer program product can be tangibly embodied in an information carrier. The computer program product may also contain instructions that, when executed, perform one or more methods, such as those described above. The information carrier is a computer- or machine-readable medium, such as the memory **604**, the storage device **606**, memory on processor **602**, or a propagated signal.

[0075] The high speed controller **608** manages bandwidth-intensive operations for the computing device **600**, while the low speed controller **612** manages lower bandwidth-intensive operations. Such allocation of functions is exemplary only. In one implementation, the high-speed controller **608** is coupled to memory **604**, display **616** (e.g., through a graphics processor or accelerator), and to high-speed expansion ports **610**, which may accept various expansion cards (not shown). In the implementation, low-speed controller **612** is coupled to storage device **606** and low-speed expansion port **614**. The low-speed expansion port, which may include various communication ports (e.g., USB, Bluetooth, Ethernet, wireless Ethernet) may be coupled to one or more input/output devices, such as a keyboard, a pointing device, a scanner, or a networking device such as a switch or router, e.g., through a network adapter.

[0076] The computing device **600** may be implemented in a number of different forms, as shown in the figure. For example, it may be implemented as a standard eerier **620**, or multiple times in a group of such servers. It may also be implemented as part of a rack server system **624**. In addition, it may be implemented in a personal computer such as a laptop computer **622**. Alternatively, components from computing device **600** may be combined with other components in a mobile device (not shown), such as device **650**. Each of such devices may contain one or more of computing device **600**, **650**, and an entire system may be made up of multiple computing devices **600**, **650** communicating with each other.

[0077] Computing device **650** includes a processor **652**, memory **664**, an input/output device such as a display **654**, a communication interface **666**, and a transceiver **668**, among other components. The device **650** may also be provided with a storage device, such as a microdrive or other device, to provide additional storage. Each of the components **650**, **652**, **664**, **654**, **666**, and **668**, are interconnected

using various buses, and several of the components may be mounted on a common motherboard or in other manners as appropriate.

[0078] The processor **652** can execute instructions within the computing device **650**, including instructions stored in the memory **664**. The processor may be implemented as a chipset of chips that include separate and multiple analog and digital processors. The processor may provide, for example, for coordination of the other components of the device **650**, such as control of user interfaces, applications run by device **650**, and wireless communication by device **650**.

[0079] Processor **652** may communicate with a user through control interface **658** and display interface **656** coupled to a display **654**. The display **654** may be, for example, a TFT LCD (Thin-Film-Transistor Liquid Crystal Display) or an OLED (Organic Light Emitting Diode) display, or other appropriate display technology. The display interface **656** may comprise appropriate circuitry for driving the display **654** to present graphical and other information to a user. The control interface **658** may receive commands from a user and convert them for submission to the processor **652**. In addition, an external interface **662** may be provide in communication with processor **652**, so as to enable near area communication of device **650** with other devices. External interface **662** may provide, for example, for wired communication in some implementations, or for wireless communication in other implementations, and multiple interfaces may also be used.

[0080] The memory **664** stores information within the computing device **650**. The memory **664** can be implemented as one or more of a computer-readable medium or media, a volatile memory unit or units, or a non-volatile memory unit or units. Expansion memory **674** may also be provided and connected to device **650** through expansion interface **672**, which may include, for example, a SIMM (Single In Line Memory Module) card interface. Such expansion memory **674** may provide extra storage space for device **650**, or may also store applications or other information for device **650**. Specifically, expansion memory **674** may include instructions to carry out or supplement the processes described above, and may include secure information also. Thus, for example, expansion memory **674** may be provide as a security module for device **650**, and may be programmed with instructions that permit secure use of device **650**. In addition, secure applications may be provided via the SIMM cards, along with additional information, such as placing identifying information on the SIMM card in a non-hackable manner.

[0081] The memory may include, for example, flash memory and/or NVRAM memory, as discussed below. In one implementation, a computer program product is tangibly embodied in an information carrier. The computer program product contains instructions that, when executed, perform one or more methods, such as those described above. The information carrier is a computer- or machine-readable medium, such as the memory **664**, expansion memory **674**, memory on processor **652**, or a propagated signal that may be received, for example, over transceiver **668** or external interface **662**.

[0082] Device **650** may communicate wirelessly through communication interface **666**, which may include digital signal processing circuitry where necessary. Communication interface **666** may provide for communications under various modes or protocols, such as GSM voice calls, SMS, EMS, or MMS messaging, CDMA, TDMA, PDC, WCDMA, CDMA2000, or GPRS, among others. Such communication may occur, for example, through radio-frequency transceiver **668**. In addition, short-range communication may occur, such as using a Bluetooth, WiFi, or other such transceiver (not shown). In addition, GPS (Global Positioning System) receiver module **670** may provide additional navigation- and location-related wireless data to device **650**, which may be used as appropriate by applications running on device **650**.

[0083] Device **650** may also communicate audibly using audio codec **660**, which may receive spoken information from a user and convert it to usable digital information. Audio codec **660** may likewise generate audible sound for a user, such as through a speaker, e.g., in a handset of device **650**. Such sound may include sound from voice telephone calls, may include recorded sound (e.g., voice messages, music files) and may also include sound generated by applications operating on device **650**.

[0084] The computing device **650** may be implemented in a number of different forms, as shown in the figure. For example, it may be implemented as a cellular telephone **680**. It may also be implemented as part of a smartphone **682**, personal digital assistant, or other similar mobile device.

[0085] Various implementations of the systems and techniques described here can be realized in digital electronic circuitry, integrated circuitry, specially designed ASICs (application specific integrated circuits), computer hardware, firmware, software, and/or combinations thereof. These various implementations can include implementation in one or more computer programs that are executable and/or interpretable on a programmable system including at least one programmable processor, which may be special or general purpose, coupled to receive data and instructions from, and to transmit data and instructions to, a storage system, at least one input device, and at least one output device.

[0086] These computer programs (also known as programs, software, software applications or code) include machine instructions for a programmable processor, and can be implemented in a high-level procedural and/or object-oriented programming language, and/or in assembly/machine language. As used herein, the terms "machine-readable medium" "computer-readable medium" refers to any computer program product, apparatus and/or device (e.g., magnetic discs, optical disks, memory, Programmable Logic Devices (PLDs)) used to provide machine instructions and/or to a programmable processor, including a machine-readable medium that receives machine instructions as a machine-readable signal. The term "machine-readable signal" refers to any signal used to provide machine instructions and/or data to a programmable processor.

[0087] To provide for interaction with a user, the systems and techniques described here can be implemented on a computer having a display device (e.g., a CRT (cathode ray tube) or LCD (liquid crystal display) monitor) for displaying information to the user and a keyboard and a pointing device (e.g., a mouse or a trackball) by which the user can provide input to the computer. Other kinds of devices can be used to provide for interaction with a user as well; for example, feedback provided to the user can be any form of sensory feedback (e.g., visual feedback, auditory feedback, or tactile

feedback); and input from the user can be received in any form, including acoustic, speech, or tactile input.

[0088] The systems and techniques described here can be implemented in a computing system that includes a back end component (e.g., as a data server), or that includes a middleware component (e.g., an application server), or that includes a front end component (e.g., a client computer having a graphical user interface or a Web browser through which a user can interact with an implementation of the systems and techniques described here), or any combination of such back end, middleware, or front end components. The components of the system can be interconnected by any form or medium of digital data communication (e.g., a communication network). Examples of communication networks include a local area network ("LAN"), a wide area network ("WAN"), and the Internet.

[0089] The computing system can include clients and servers. A client and server are generally remote from each other and typically interact through a communication network. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.

[0090] A number of embodiments have been described. Nevertheless, it will be Understood that various modifications may be made without departing from the spirit and scope of the invention.

[0091] In addition, the logic flows depicted in the figures do not require the particular order shown, or sequential order, to achieve desirable results. In addition, other steps may be provided, or steps may be eliminated, from the described flows, and other components may be added to, or removed from, the described systems. Accordingly, other embodiments are within the scope of the following claims.

What is claimed is:

1.-**24**. (canceled)

25. A method for providing users with estimated wait times for servicing requests, the method comprising:

receiving, by a computing server, a request submitted by a user via a client device;

adding the received request to a requests queue comprising a plurality of requests;

identifying a plurality of agents available to service the plurality of requests, based on a respective capability of each of the agents to service one or more categories of requests, and identifying a respective availability time for each of the plurality of agents, wherein the respective capability of each of the agents involves at least one of an amount of experience, an efficiency level, and an authority level;

running, responsive to receiving the request submitted by the user, a simulation based on the capabilities of the agents and the availability times for the agents to determine an estimated wait time for the request submitted by the user; and

presenting the estimated wait time to the user via the client device.

26. The method of claim **25**, wherein running the simulation comprises:

assigning an agent having an earliest availability time to an oldest request in the requests queue that the agent has a capability to service;

estimating an amount of time required to service the oldest request;

updating the availability time for the agent based on the estimated amount of time required to service the oldest request; and

repeating the assigning, estimating, and updating steps until an agent is assigned to the request submitted by the client device.

27. The method of claim **26**, wherein estimating an amount of time required to service the oldest request comprises:

identifying an attribute of the agent assigned to the oldest request, the attribute comprising at least one of an experience level or an efficiency level; and

using the identified attribute to estimate the amount of time for the agent to service the oldest request.

28. The method of claim **26**, wherein estimating an amount of time required to service the oldest request comprises:

accessing a requests data store to identify a history of times required by the plurality of agents to service previous requests in a same category as the oldest request;

calculating a historical average of the identified times required to service previous requests in the same category as the oldest request; and

using the historical average as the estimated amount of time to service the oldest request.

29. The method of claim **26**, wherein estimating an amount of time required to service the oldest request comprises:

accessing an agents data store to identify a history of times required by the agent assigned to the oldest request to service previous requests;

calculating a historical average of the times required by the agent assigned to the oldest request to service previous requests; and

using the historical average as the estimated amount of time to service the oldest request.

30. The method of claim **26**, wherein estimating an amount of time required to service the oldest request comprises:

determining whether the agent assigned to the oldest request is capable of concurrently servicing multiple requests; and

in response to a determination that the agent is capable of concurrently servicing multiple requests, updating the availability time for the agent based on a number of concurrent requests that the agent is capable of servicing.

31. The method of claim **30**, wherein updating the availability time for the agent assigned to the oldest request comprises:

determining the number of requests that the agent is capable of concurrently servicing;

calculating a modified servicing time by dividing the estimated amount of time required to service the oldest request by the number of requests that the agent is capable of concurrently servicing; and

adding the modified servicing time to the availability time for the agent assigned to the oldest request.

32. The method of claim **25**, further comprising:

generating a list of the plurality of agents available to service requests; and

sorting the list according to the availability times for the plurality of agents, wherein the availability time for an agent is an earliest time at which the agent is available to service a request.

33. The method of claim **25**, further comprising:

identifying one or more of the plurality of agents currently servicing a request at a time the simulation is started;

estimating a time required for each of the identified agents to finish servicing the request currently being serviced by the agent; and

updating the availability time for each of the identified agents based on the estimated time required for the agent to finish servicing the request currently being serviced by the agent.

34. The method of claim **33**, wherein estimating the time required for each of the identified agents to finish servicing the request currently being serviced by the agent comprises, for each of the identified agents:

accessing a data store to identify a history of times required by the agent to service previous requests;

calculating a historical average of the times required by the agent to service previous requests; and

using one half of the historical average as the estimated time required to finish servicing the request currently being serviced by the agent.

35. A system for providing users with estimated wait times for servicing requests, the system comprising:

a computing device configured to:

receive a request submitted to the computing device by a user via a client device;

add the received request to a requests queue comprising a plurality of requests;

identify a plurality of agents available to service the plurality of requests, based on a respective capability of each of the agents to service one or more categories of requests, and identify a respective availability time for each of the plurality of agents, wherein the respective capability of each of the agents involves at least one of an amount of experience, an efficiency level, and an authority level;

run, responsive to receiving the request submitted by the user, a simulation based on the capabilities of the agents and the availability times for the agents to determine an estimated wait time for the request submitted by the user; and

present the estimated wait time to the user via the client device.

36. The system of claim **35**, wherein running the simulation comprises:

assigning an agent having an earliest availability time to an oldest request in the requests queue that the agent has a capability to service;

estimating an amount of time required to service the oldest request;

updating the availability time for the agent based on the estimated amount of time required to service the oldest request; and

repeating the assigning, estimating, and updating steps until an agent is assigned to the request submitted by the client device.

37. The system of claim **36**, wherein estimating an amount of time required to service the oldest request comprises:

identifying an attribute of the agent assigned to the oldest request, the attribute comprising at least one of an experience level or an efficiency level; and

using the identified attribute to estimate the amount of time for the agent to service the oldest request.

38. The system of claim **36**, wherein estimating an amount of time required to service the oldest request comprises:

accessing a data store to identify a history of times required to service previous requests;

calculating a historical average of the identified times required to service the previous requests; and

using the historical average as the estimated amount of time to service the oldest request.

39. The system of claim **36**, wherein estimating an amount of time required to service the oldest request comprises:

determining whether the agent assigned to the oldest request is capable of concurrently servicing multiple requests; and

in response to a determination that the agent is capable of concurrently servicing multiple requests, updating the availability time for the agent based on a number of concurrent requests that the agent is capable of servicing.

40. The system of claim **39**, wherein updating the availability time for the agent assigned to the oldest request comprises:

determining the number of requests that the agent is capable of concurrently servicing;

calculating a modified servicing time by dividing the estimated amount of time required to service the oldest request by the number of requests that the agent is capable of concurrently servicing; and

adding the modified servicing time to the availability time for the agent assigned to the oldest request.

41. A method for providing users with estimated wait times for servicing requests, the method comprising:

receiving, by a computing server, a request submitted by a user via a client device;

adding the received request to a requests queue comprising a plurality of requests;

identifying a plurality of agents for servicing the plurality of requests;

running, responsive to receiving the request submitted by the user, a simulation to determine an estimated wait time for the request submitted by the user, wherein the simulation is based at least in part on capability of the plurality of agents, and wherein capability of the agents involves at least one of an amount of experience, an efficiency level, and an authority level; and

presenting the estimated wait time to the user via the client device.

42. (canceled)

43. The method of claim **41**, wherein each of the plurality of agents has an availability time;

wherein the simulation to determine the estimated wait time for the request submitted by the client device is based on the availability times for the agents.

44. The method of claim **43**, wherein running the simulation comprises:

assigning an agent having an earliest availability time to an oldest request in the requests queue that the agent has a capability to service;

estimating an amount of time required to service the oldest request;

updating the availability time for the agent based on the estimated amount of time required to service the oldest request; and

repeating the assigning, estimating, and updating steps until an agent is assigned to the request submitted by the client device.

45. The method of claim **25**, further comprising:

running a second simulation, subsequent to providing the estimated wait time to the client device, the second simulation based on a set of updated availability times for the agents to determine a recalculated estimated wait time for the request submitted by the client device; and

providing the recalculated estimated wait time to the client device.

46. The system of claim **35**, the computing device further configured to:

run a second simulation, subsequent to providing the estimated wait time to the client device, the second simulation based on a set of updated availability times for the agents to determine a recalculated estimated wait time for the request submitted by the client device; and

provide the recalculated estimated wait time to the client device.

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