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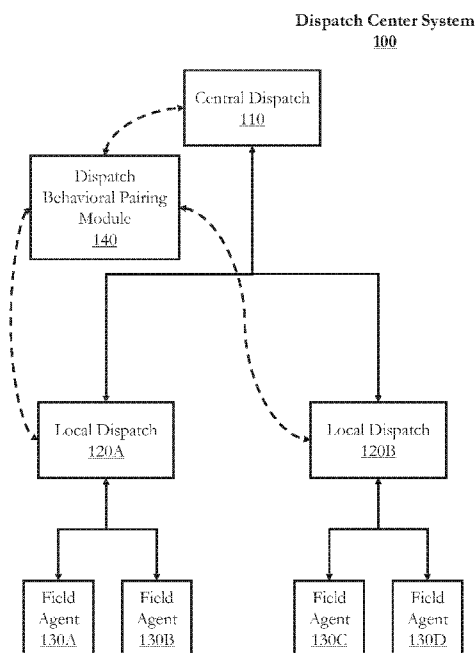


FIG. 1

(57) Abstract: Techniques for behavioral pairing in a dispatch center system are disclosed. In one particular embodiment, the techniques may be realized as a method for behavioral pairing in a dispatch center system comprising determining, by at least one computer processor communicatively coupled to and configured to operate in the dispatch center system, a dispatch request for a customer; determining, by the at least one computer processor, a plurality of field agents available to service the customer's dispatch request; determining, by the at least one computer processor, a model of preferred field agent-customer pairings based at least in part on historical field agent-customer interaction outcome data; selecting, by the at least one computer processor, one of the plurality of field agents based on the model; and outputting, by the at least one computer processor, the selection to facilitate dispatching the selected field agent to the customer.



TECHNIQUES FOR BEHAVIORAL PAIRING IN A DISPATCH CENTER SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This international patent application claims priority to U.S. Patent Application No.
5 15/480,034, filed April 5, 2017, which is hereby incorporated by reference in its entirety as if
fully set forth herein.

FIELD OF THE DISCLOSURE

This disclosure generally relates to pairing dispatched field agents with customers
10 through dispatch centers and, more particularly, to techniques for behavioral pairing in a
dispatch center system.

BACKGROUND OF THE DISCLOSURE

A typical dispatch center algorithmically assigns customers requesting service to field
15 agents available for assignment to those customers. The dispatch center may include a contact
center for receiving customer requests (*e.g.*, telephone calls, Internet chat sessions or forms,
emails, text messages). The field agents may perform a variety of tasks in various sectors,
such as cable installation for a telecommunications company, claim adjusting for an insurance
company, etc.

20 In some typical dispatch centers, customers are assigned to field agents ordered based
on which field agent has been waiting the longest for a new dispatch, appointment
availability, location, etc. Field agents and/or customers may be assigned to each other on a
first-come, first-served basis. This strategy may be referred to as a “first-in, first-out”,
“FIFO”, or “round-robin” strategy.

In some advanced contact centers, contacts (*e.g.*, callers) are paired with agents (*e.g.*, phone agents) using a “behavioral pairing,” or a “BP” strategy, under which contacts and agents may be deliberately (preferentially) paired in a fashion that enables the assignment of subsequent contact-agent pairs such that when the benefits of all the assignments under a BP strategy are totaled they may exceed those of FIFO and other strategies such as performance-based routing (“PBR”) strategies. BP is designed to encourage balanced utilization of agents within a skill queue while nevertheless simultaneously improving overall contact center performance beyond what FIFO or PBR methods will allow. This is a remarkable achievement inasmuch as BP acts on the same contacts and same agents as FIFO or PBR methods, utilizes agents approximately evenly as FIFO provides, and yet improves overall contact center performance. BP is described in, *e.g.*, U.S. Patent No. 9,300,802, which is incorporated by reference herein. Additional information about these and other features regarding the pairing or matching modules (sometimes also referred to as “SATMAP”, “routing system”, “routing engine”, etc.) is described in, for example, U.S. Patent No. 8,879,715, which is incorporated by reference herein.

However, even these advanced contact centers using BP dispatch field agents to customers using a suboptimal strategy such as FIFO. Field agents have numerous opportunities to deliver value to customers on behalf of their companies, such as customer satisfaction, up-selling and cross-selling, job completion time, etc., and under a FIFO pairing strategy, field agents will not be paired with customers so as to optimize dispatch center performance.

For example, in the television provider industry, a field technician may be dispatched to a customer residence to install or repair access to content via satellite, fiber optics, coaxial cable, etc. During the customer interaction, the field technician may have an opportunity to develop a rapport with the customer, thereby improving customer satisfaction with the

installation or repair experience. The field technician may also have an opportunity to assess the customer's other needs and inform the customer about additional products or services (e.g., premium channel subscriptions, warranties, screen wipes, sound bars), generating additional up-sell or cross-sell revenue along with increased customer satisfaction. Therefore, 5 determining a preferred pairing between a field agent and a customer may increase the likelihood of an optimal field agent–customer interaction over a typical FIFO pairing strategy.

In view of the foregoing, it may be understood that there is a need for a system that enables improving the efficiency and performance of dispatch pairing strategies that are 10 distend to choose among multiple possible dispatch pairings such as a BP strategy.

SUMMARY OF THE DISCLOSURE

Techniques for behavioral pairing in a dispatch center system are disclosed. In one particular embodiment, the techniques may be realized as a method for behavioral pairing in 15 a dispatch center system comprising determining, by at least one computer processor communicatively coupled to and configured to operate in the dispatch center system, a dispatch request for a customer; determining, by the at least one computer processor, a plurality of field agents available to service the customer's dispatch request; determining, by the at least one computer processor, a model of preferred field agent–customer pairings based 20 at least in part on historical field agent–customer interaction outcome data; selecting, by the at least one computer processor, one of the plurality of field agents based on the model; and outputting, by the at least one computer processor, the selection to facilitate dispatching the selected field agent to the customer.

In accordance with other aspects of this particular embodiment, the dispatch request 25 comprises at least one requested dispatch time, and determining the plurality of field agents

available to service the customer's dispatch request is constrained based on the at least one requested dispatch time.

In accordance with other aspects of this particular embodiment, the techniques may further comprise selecting, by the at least one computer processor, at least one suggested
5 dispatch time, wherein the selected field agent is available during the at least one suggested dispatch time.

In accordance with other aspects of this particular embodiment, the selected field agent may be dispatched immediately or as soon as practicable after the selection.

In accordance with other aspects of this particular embodiment, the techniques may
10 further comprise recording, by the at least one computer processor, results for a first plurality of field-agent customer interactions paired using a behavioral pairing strategy; recording, by the at least one computer processor, results for a second plurality of field-agent customer interactions paired using a FIFO pairing strategy; and outputting, by the at least one computer processor, a measure of relative performance between the behavioral pairing strategy and the
15 FIFO pairing strategy based on the recorded results for the first and second pluralities of field-agent customer interactions.

In accordance with other aspects of this particular embodiment, the techniques may further comprise updating, by the at least one computer processor, the model based at least in part on one or more of: the results for the first plurality of field-agent customer interactions,
20 the results for the second plurality of field-agent customer interactions, and the measure of relative performance.

In accordance with other aspects of this particular embodiment, the model may be based on a diagonal strategy.

In another particular embodiment, the techniques may be realized as a system for
25 behavioral pairing in a dispatch center system comprising at least one computer processor

communicatively coupled to and configured to operate in the dispatch center system, wherein the at least one computer processor is further configured to perform the steps in the above-discussed method.

In another particular embodiment, the techniques may be realized as an article of manufacture for behavioral pairing in a dispatch center system comprising a non-transitory processor readable medium and instructions stored on the medium, wherein the instructions are configured to be readable from the medium by at least one computer processor communicatively coupled to and configured to operate in the dispatch center system and thereby cause the at least one computer processor to operate to perform the steps in the above-discussed method.

The present disclosure will now be described in more detail with reference to particular embodiments thereof as shown in the accompanying drawings. While the present disclosure is described below with reference to particular embodiments, it should be understood that the present disclosure is not limited thereto. Those of ordinary skill in the art having access to the teachings herein will recognize additional implementations, modifications, and embodiments, as well as other fields of use, which are within the scope of the present disclosure as described herein, and with respect to which the present disclosure may be of significant utility.

20

BRIEF DESCRIPTION OF THE DRAWINGS

To facilitate a fuller understanding of the present disclosure, reference is now made to the accompanying drawings, in which like elements are referenced with like numerals. These drawings should not be construed as limiting the present disclosure, but are intended to be illustrative only.

FIG. 1 shows a block diagram of a dispatch center system according to embodiments of the present disclosure.

FIG. 2 shows an example of a BP dispatching method according to embodiments of the present disclosure.

5 FIG. 3 depicts an example of a dispatch benchmarking method according to embodiments of the present disclosure.

DETAILED DESCRIPTION

FIG. 1 shows a block diagram of a dispatch center system 100 according to
10 embodiments of the present disclosure. The description herein describes network elements, computers, and/or components of a system and method for simulating dispatch center systems that may include one or more modules. As used herein, the term “module” may be understood to refer to computing software, firmware, hardware, and/or various combinations thereof. Modules, however, are not to be interpreted as software which is not implemented on
15 hardware, firmware, or recorded on a processor readable recordable storage medium (*i.e.*, modules are not software *per se*). It is noted that the modules are exemplary. The modules may be combined, integrated, separated, and/or duplicated to support various applications. Also, a function described herein as being performed at a particular module may be performed at one or more other modules and/or by one or more other devices instead of or in
20 addition to the function performed at the particular module. Further, the modules may be implemented across multiple devices and/or other components local or remote to one another. Additionally, the modules may be moved from one device and added to another device, and/or may be included in both devices.

As shown in FIG. 1, the dispatch center system 100 may include a central dispatch
25 110. The central dispatch 110 may receive incoming customer requests (*e.g.*, requests from

callers) or support outbound connections to customers via a telecommunications network (not shown). The central dispatch 110 may include customer request routing hardware and software for helping to route customer requests among one or more dispatch centers, or to one or more PBX/ACDs or other queuing or switching components, including other Internet-based, cloud-based, or otherwise networked agent–customer hardware or software-based dispatch center solutions.

The central dispatch 110 may not be necessary such as if there is only one dispatch center, or if there is only one PBX/ACD routing component, in the dispatch center system 100. If more than one dispatch center is part of the dispatch center system 100, each dispatch center may include at least one local dispatch (e.g., local dispatches 120A and 120B). The local dispatches 120A and 120B may be communicatively coupled to the central dispatch 110. In embodiments, various topologies of routing and network components may be configured to implement the dispatch center system.

Each local dispatch for each dispatch center may be communicatively coupled to a plurality (or “pool”) of field agents. Each dispatch center may support a certain number of field agents to be available for scheduling during a given time. At any given time, a field agent may be available and waiting to be dispatched to a contact (e.g., for immediate dispatch, or for an open appointment time at a future date and time), or the field agent may be unavailable for any of a number of reasons, such as already having been dispatched—or scheduled for a future dispatch—to another customer. The dispatch center may also account for additional field agent activities such as travel time to and from the customer, and performing certain post-dispatch functions such as logging information about the dispatch, or taking breaks.

In the example of FIG. 1, the central dispatch 110 routes customer requests to one of two local dispatches via local dispatch 120A and local dispatch 120B, respectively. Each of

the local dispatches 120A and 120B are shown with two field agents each. Field agents 130A and 130B may be assigned or otherwise delegated to local dispatch 120A, and field agents 130C and 130D may be assigned or otherwise delegated to local dispatch 120B.

The dispatch center system 100 may also be communicatively coupled to an integrated service from, for example, a third party vendor. In the example of FIG. 1, dispatch BP module 140 may be communicatively coupled to one or more dispatches in the dispatch center system 100, such as central dispatch 110, local dispatch 120A, or local dispatch 120B. In some embodiments, central or local dispatches of the dispatch center system 100 may be communicatively coupled to multiple dispatch BP modules. In some embodiments, dispatch BP module 140 may be embedded within a component of a dispatch center system (*e.g.*, embedded in or otherwise integrated with a dispatch center component, or a “BP dispatch center”). The dispatch BP module 140 may receive information from a dispatch component (*e.g.*, local dispatch 120A) about field agents assigned to the dispatch (*e.g.*, field agents 130A and 130B) and about incoming customer requests via another dispatch component (*e.g.*, central dispatch 110) or, in some embodiments, from a network (*e.g.*, the Internet or a telecommunications network) (not shown).

A dispatch center may include multiple pairing modules (*e.g.*, a dispatch BP module and a dispatch FIFO module) (not shown), and one or more pairing modules may be provided by one or more different vendors. In some embodiments, one or more pairing modules may be components of dispatch BP module 140 or one or more dispatch components such as central dispatch 110 or local dispatches 120A and 120B. In some embodiments, a dispatch BP module may determine which pairing module may handle pairing for a particular customer or other contact. For example, the dispatch BP module may alternate between enabling pairing via the dispatch BP module and enabling pairing with the dispatch FIFO module. In other embodiments, one pairing module (*e.g.*, the dispatch BP module) may be configured to

emulate other pairing strategies. For example, a dispatch BP module, or a dispatch BP component integrated with dispatch BP components in the dispatch BP module, may determine whether the dispatch BP module may use BP or emulated FIFO pairing for a particular customer request. In this case, “BP on” may refer to times when the dispatch BP
5 module is applying the BP strategy, and “BP off” may refer to other times when the dispatch BP module is applying a different pairing strategy (*e.g.*, FIFO).

In some embodiments, regardless of whether pairing strategies are handled by separate modules, or if some pairing strategies are emulated within a single pairing module, the single pairing module may be configured to monitor and store information about pairings
10 made under any or all pairing strategies. For example, a dispatch BP module may observe and record data about FIFO pairings made by a FIFO module, or the BP module may observe and record data about emulated FIFO pairings made by a BP module operating in FIFO emulation mode.

FIG. 2 shows an example of a BP dispatching method 200 according to embodiments
15 of the present disclosure. BP dispatching method 200 may begin at block 210.

At block 210, at least one customer dispatch request may be determined. For example, a customer may call a call center, and the call center agent may assess the customer’s needs and determine that a field agent should be dispatched to provide technical service to the customer. In some embodiments, an interactive voice response (IVR) system or other
20 automated computer system may assess the customer’s needs and/or determine the at least one customer dispatch request. After—or in parallel with—determining the at least one customer dispatch request, BP dispatching method 200 may proceed to block 220.

At block 220, available field agents may be determined. In some embodiments, available field agents may be limited to those field agents that are available for immediate (or
25 otherwise near-term) dispatch to the customer. In other embodiments, available field agents

may be limited to those field agents that are available during the requested dates or time windows requested by the customer, or to those field agents that are available during dates or time windows suggested by the dispatcher (*e.g.*, a call center agent). In other embodiments, the available field agents may be any or all of the agents assigned or otherwise delegated to a particular dispatch center or dispatch queue (*e.g.*, local dispatch), regardless of potential scheduling constraints. After determining available field agents, BP dispatching method 200 may proceed to block 230.

At block 230, a dispatch BP model of preferred field agent–customer pairings may be determined, based at least in part on an analysis of historical field agent–customer interaction outcome data. In some embodiments, historical outcome data, customer attribute data (*e.g.*, customer relationship management or CRM data), and/or third-party data may be analyzed, and a computer-generated model of preferred field agent–customer pairings may be generated. In some embodiments, the dispatch BP model may be based on a diagonal strategy for BP. In some embodiments, the dispatch BP model may be used to increase the overall performance of the dispatch center system while targeting a balanced utilization of field agents. After determining the dispatch BP model, BP dispatching method 200 may proceed to block 240.

At block 240, one of the field agents determined at block 220 may be selected for pairing to a customer whose request was determined at block 210 based on the dispatch BP model determined at block 230. In some embodiments, such as those in which the available field agents may be any or all of the agents assigned or otherwise delegated to a particular dispatch center or dispatch queue (*e.g.*, local dispatch), regardless of potential scheduling constraints, the BP dispatching method 200 may suggest specific dates or time windows to the customer during which one or more preferred field agents would be available.

The selected pairing may be outputted to another component of the dispatch center system or otherwise displayed or used to assign the field agent and schedule the dispatch. After outputting the selected field agent–customer pairing, BP dispatching method 200 may end.

5 FIG. 3 depicts an example of a dispatch benchmarking method 300 according to embodiments of the present disclosure. At block 310, dispatch benchmarking method 300 may begin.

At block 310, results for a first plurality of field agent–customer interactions paired using a first pairing strategy of alternating pairing strategies may be recorded or otherwise
10 determined. For example, after a field technician finishes installing cable television service in a customer’s home, the customer may be asked to rate the field technician’s performance and answer other questions regarding customer satisfaction. In another example, a field technician may sell the customer additional products or services during the interaction, such as a warranty, a premium channel subscription, or a speaker system. During or after the
15 interaction, the field technician may submit or otherwise record information about the sale. In another example, information about the interaction outcome may be recorded automatically, such as the amount of time the field technician spent during the interaction.

In some embodiments, the alternating strategies may be BP and a FIFO pairing strategy, and the first pairing strategy may be BP. In these embodiments, each of the first
20 plurality of field agent–customer interactions may have been paired using BP and thus have a likelihood of improving the overall performance of the dispatch center compared with pairing using FIFO. In some embodiments, pairing strategies may alternate according to periodic cycling (*e.g.*, cycling BP on and off). In some embodiments, the dispatch center system may cycle among more than two pairing strategies.

After—or in parallel with—determining results for a first plurality of field agent–customer interactions paired using the first pairing strategy, dispatch benchmarking method 300 may proceed to block 320.

At block 320, results for a second plurality of field agent–customer interactions paired using the second pairing strategy of the alternating pairing strategies may be recorded or otherwise determined. In some embodiments, the second pairing strategy may be FIFO or another non-BP pairing strategy. In these embodiments, each of the second plurality of field agent–customer interactions may have been paired using FIFO (or another non-BP pairing strategy) and thus likely have a worse overall performance of the dispatch center compared with pairing using BP. After determining results for the second plurality of field agent–customer interactions paired using the second pairing strategy, dispatch benchmarking method 300 may proceed to block 330.

At block 330, relative performance between the alternating pairing strategies may be determined. For example, if the alternating pairing strategies are BP and FIFO, dispatch benchmarking method may compare the performance of the first plurality of interactions with the performance of the second plurality of interactions. The relative performance may represent a performance gain achieved using BP instead of FIFO. In some embodiments, such as those in which BP is provided by a third-party vendor, payments to the third-party vendor may be calculated based at least in part on the extent of performance gain actually measured over a period of time that is attributable to BP.

At this point it should be noted that behavioral pairing in a dispatch center system in accordance with the present disclosure as described above may involve the processing of input data and the generation of output data to some extent. This input data processing and output data generation may be implemented in hardware or software. For example, specific electronic components may be employed in a behavioral pairing module or similar or related

circuitry for implementing the functions associated with behavioral pairing in a dispatch center system in accordance with the present disclosure as described above. Alternatively, one or more processors operating in accordance with instructions may implement the functions associated with behavioral pairing in a dispatch center system in accordance with the present disclosure as described above. If such is the case, it is within the scope of the present disclosure that such instructions may be stored on one or more non-transitory processor readable storage media (*e.g.*, a magnetic disk or other storage medium), or transmitted to one or more processors via one or more signals embodied in one or more carrier waves.

The present disclosure is not to be limited in scope by the specific embodiments described herein. Indeed, other various embodiments of and modifications to the present disclosure, in addition to those described herein, will be apparent to those of ordinary skill in the art from the foregoing description and accompanying drawings. Thus, such other embodiments and modifications are intended to fall within the scope of the present disclosure. Further, although the present disclosure has been described herein in the context of at least one particular implementation in at least one particular environment for at least one particular purpose, those of ordinary skill in the art will recognize that its usefulness is not limited thereto and that the present disclosure may be beneficially implemented in any number of environments for any number of purposes. Accordingly, the claims set forth below should be construed in view of the full breadth and spirit of the present disclosure as described herein.

CLAIMS

1. A method for behavioral pairing in a dispatch center system comprising:
 - determining, by at least one computer processor communicatively coupled to and configured to operate in the dispatch center system, a dispatch request for a customer;
 - determining, by the at least one computer processor, a plurality of field agents available to service the customer's dispatch request;
 - determining, by the at least one computer processor, a model of preferred field agent--customer pairings based at least in part on historical field agent--customer interaction outcome data;
 - selecting, by the at least one computer processor, one of the plurality of field agents based on the model; and
 - outputting, by the at least one computer processor, the selection to facilitate dispatching the selected field agent to the customer.
2. The method of claim 1, wherein the dispatch request comprises at least one requested dispatch time, and wherein determining the plurality of field agents available to service the customer's dispatch request is constrained based on the at least one requested dispatch time.
3. The method of claim 1, further comprising selecting, by the at least one computer processor, at least one suggested dispatch time, wherein the selected field agent is available during the at least one suggested dispatch time.
4. The method of claim 1, wherein the selected field agent is dispatched immediately or as soon as practicable after the selection.

5. The method of claim 1, further comprising:

recording, by the at least one computer processor, results for a first plurality of field-agent customer interactions paired using a behavioral pairing strategy;

recording, by the at least one computer processor, results for a second plurality of field-agent customer interactions paired using a FIFO pairing strategy; and

outputting, by the at least one computer processor, a measure of relative performance between the behavioral pairing strategy and the FIFO pairing strategy based on the recorded results for the first and second pluralities of field-agent customer interactions.

6. The method of claim 5, further comprising updating, by the at least one computer processor, the model based at least in part on one or more of: the results for the first plurality of field-agent customer interactions, the results for the second plurality of field-agent customer interactions, and the measure of relative performance.

7. The method of claim 1, wherein the model is based on a diagonal strategy.

8. A system for behavioral pairing in a dispatch center system comprising:

at least one computer processor communicatively coupled to and configured to operate in the dispatch center system, wherein the at least one computer processor is further configured to:

determine a dispatch request for a customer;

determine a plurality of field agents available to service the customer's dispatch request;

determine a model of preferred field agent–customer pairings based at least in part on historical field agent–customer interaction outcome data;

select one of the plurality of field agents based on the model; and

output the selection to facilitate dispatching the selected field agent to the customer.

9. The system of claim 8, wherein the dispatch request comprises at least one requested dispatch time, and wherein determining the plurality of field agents available to service the customer's dispatch request is constrained based on the at least one requested dispatch time.

10. The system of claim 8, wherein the at least one computer processor is further configured to select at least one suggested dispatch time, wherein the selected field agent is available during the at least one suggested dispatch time.

11. The system of claim 8, wherein the selected field agent is dispatched immediately or as soon as practicable after the selection.

12. The system of claim 8, wherein the at least one computer processor is further configured to:

record results for a first plurality of field–agent customer interactions paired using a behavioral pairing strategy;

record results for a second plurality of field–agent customer interactions paired using a FIFO pairing strategy; and

output a measure of relative performance between the behavioral pairing strategy and the FIFO pairing strategy based on the recorded results for the first and second pluralities of field-agent customer interactions.

13. The system of claim 12, wherein the at least one computer processor is further configured to update the model based at least in part on one or more of: the results for the first plurality of field-agent customer interactions, the results for the second plurality of field-agent customer interactions, and the measure of relative performance.

14. The system of claim 8, wherein the model is based on a diagonal strategy.

15. An article of manufacture for behavioral pairing in a dispatch center system comprising:

a non-transitory processor readable medium; and

instructions stored on the medium;

wherein the instructions are configured to be readable from the medium by at least one computer processor communicatively coupled to and configured to operate in the dispatch center system and thereby cause the at least one computer processor to operate so as to:

determine a dispatch request for a customer;

determine a plurality of field agents available to service the customer's dispatch request;

determine a model of preferred field agent-customer pairings based at least in part on historical field agent-customer interaction outcome data;

select one of the plurality of field agents based on the model; and

output the selection to facilitate dispatching the selected field agent to the customer.

16. The article of manufacture of claim 15, wherein the dispatch request comprises at least one requested dispatch time, and wherein determining the plurality of field agents available to service the customer's dispatch request is constrained based on the at least one requested dispatch time.

17. The article of manufacture of claim 15, wherein the instructions further cause the at least one computer processor to operate so as to select at least one suggested dispatch time, wherein the selected field agent is available during the at least one suggested dispatch time.

18. The article of manufacture of claim 15, wherein the selected field agent is dispatched immediately or as soon as practicable after the selection.

19. The article of manufacture of claim 15, wherein the instructions further cause the at least one computer processor to operate so as to:

record results for a first plurality of field-agent customer interactions paired using a behavioral pairing strategy;

record results for a second plurality of field-agent customer interactions paired using a FIFO pairing strategy; and

output a measure of relative performance between the behavioral pairing strategy and the FIFO pairing strategy based on the recorded results for the first and second pluralities of field-agent customer interactions.

20. The article of manufacture of claim 19, wherein the instructions further cause the at least one computer processor to operate so as to update the model based at least in part on one or more of: the results for the first plurality of field-agent customer interactions, the results for the second plurality of field-agent customer interactions, and the measure of relative performance.

21. The article of manufacture of claim 15, wherein the model is based on a diagonal strategy.

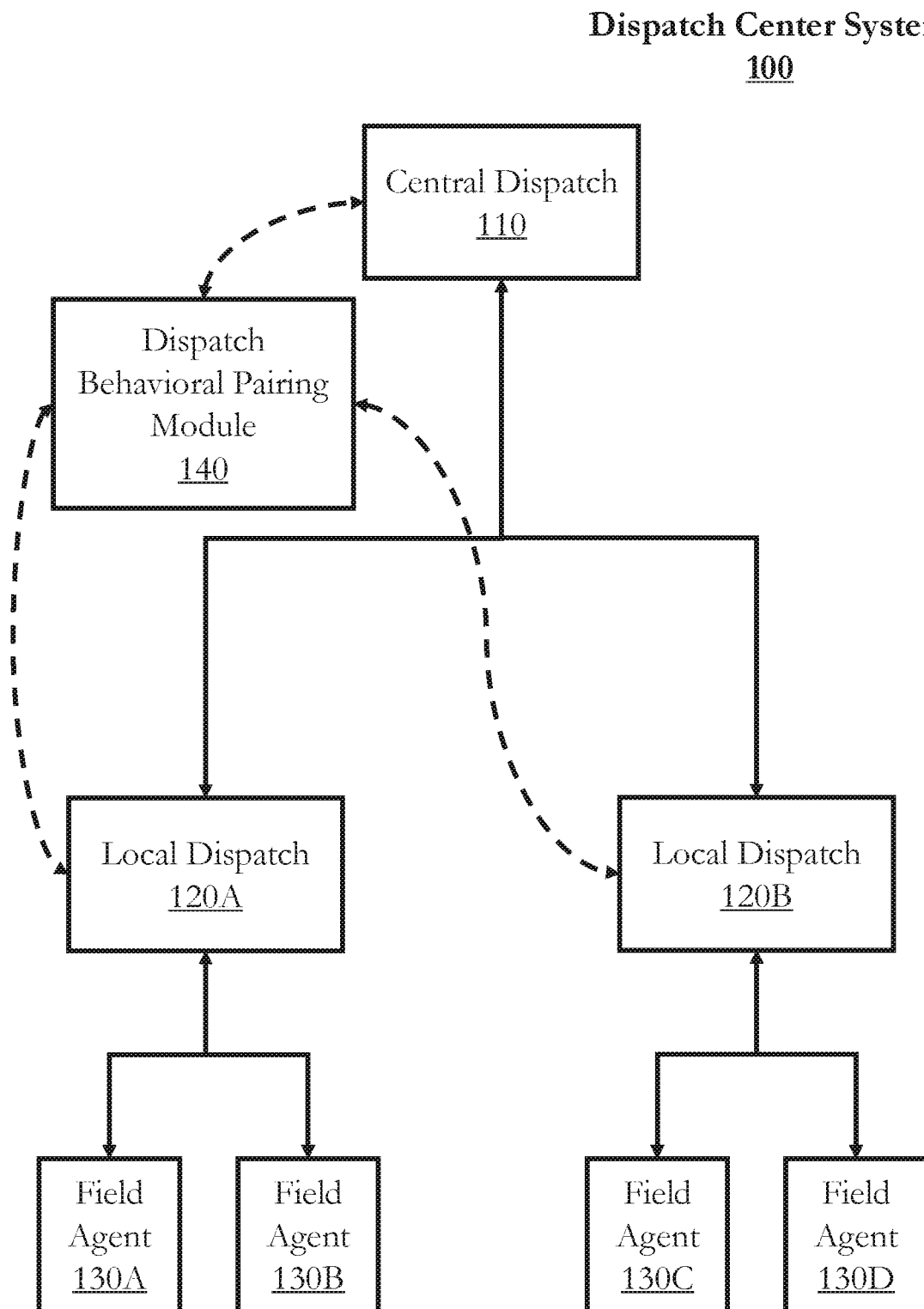


FIG. 1

**BP Dispatching
Method
200**

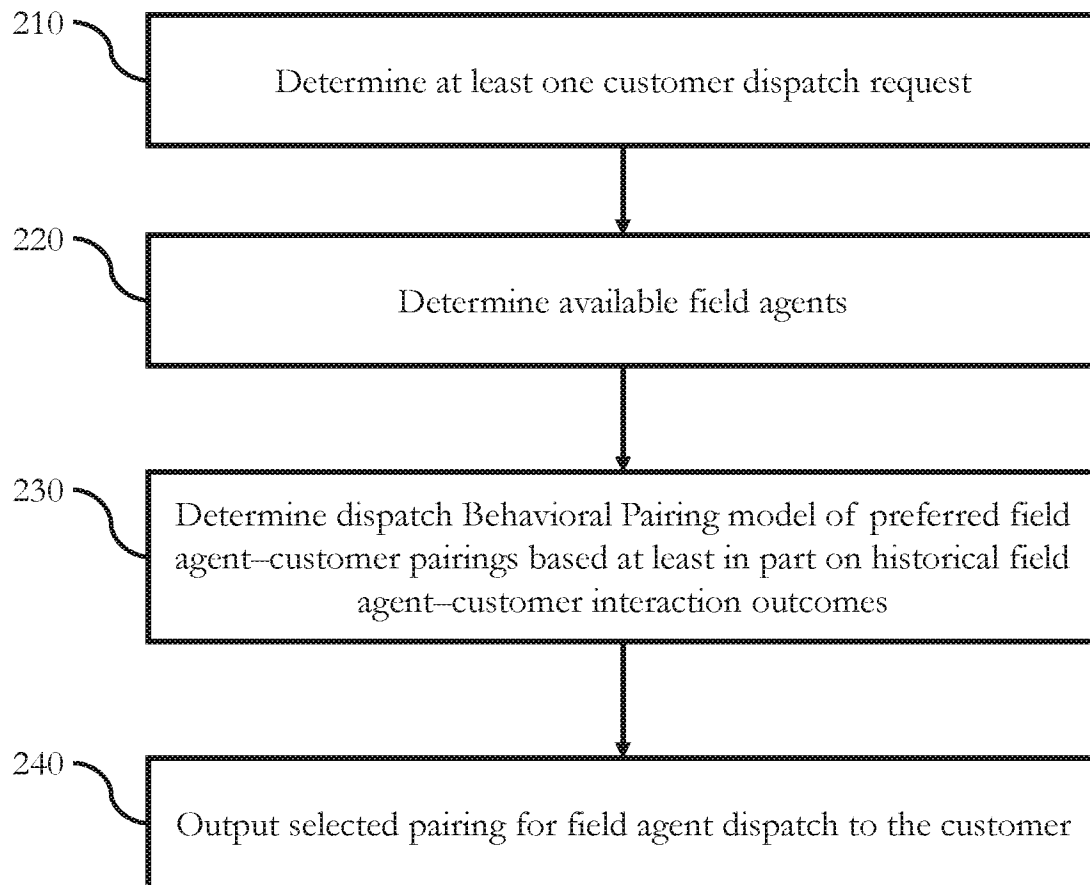


FIG. 2

**Dispatch Benchmarking
Method
300**

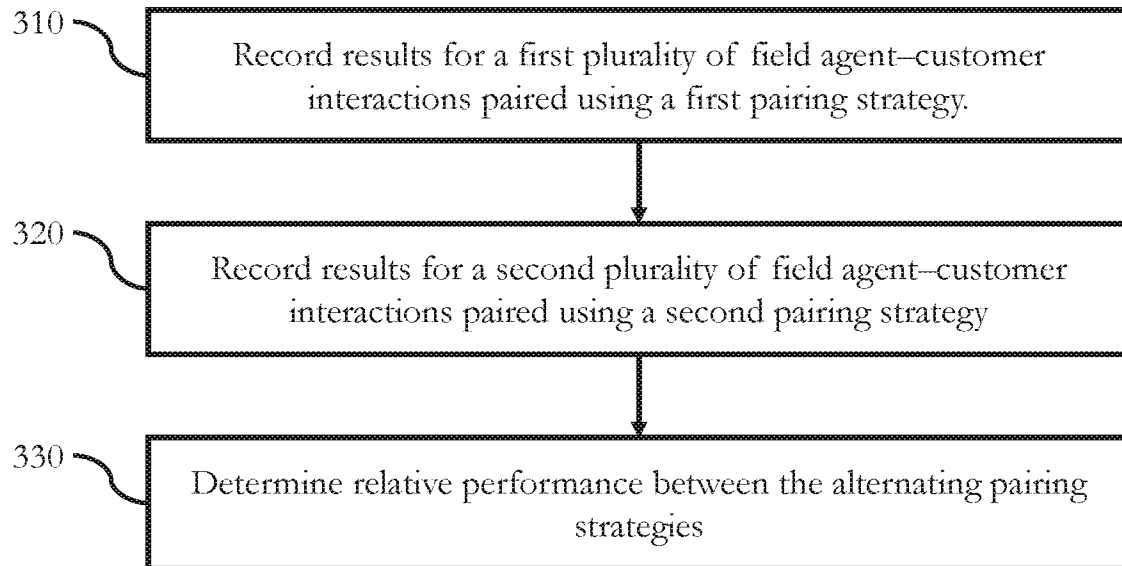


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2018/000434

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06Q10/04

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 9 300 802 B1 (SATMAP INT HOLDINGS LTD [BM]; SATMAP INT HOLDINGS LTD [BM]) 29 March 2016 (2016-03-29) cited in the application abstract; claim 1; figures 6, 7 -----	1-21
X	US 8 879 715 B2 (RESOURCE GROUP INTERNATIONAL LTD [BM]; SATMAP INT HOLDINGS LTD [BM]) 4 November 2014 (2014-11-04) cited in the application abstract; claim 1; figures 7-12 -----	1-21
X	US 2017/064081 A1 (CHISHTI ZIA [US] ET AL) 2 March 2017 (2017-03-02) abstract; claim 1; figures 1, 8 -----	1-21



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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