CLAIMS

1. A computer-implemented method to retrieve at least one fare, characterized in that it comprises:

- receiving a fare inquiry that specifies at least one rule attribute;
- performing a first search to determine rule data applicable to the at least one rule attribute; and
- performing a second search using the rule data to determine a list of fares that are applicable to the rule data.

where the second search is performed as *N* search processes that are executed in parallel, and where the determined list of fares is a merged list obtained from a list output from each of the *N* search processes.

2. The method of claim 1, where a value of *N* is determined based on a number of rules identified during the first search and on a set of predetermined thresholds, and where *N* is an integer equal to one or greater than one.

3. The method of any of claim 1 or 2, where performing the first search comprises:

- executing an edit sub-process for retrieving rules in accordance with restrictive rules attributes and obtaining associated rule categories and rule provisions; and
- executing a pre-data collection sub-process where each retrieved rule is filtered to remove rules that are not applicable and storing surviving rules.

4. The method of claim 3, where performing the second search comprises:

- executing a data collection sub-process as a plurality of parallel data collection sub-processes to retrieve, for each surviving rule, fares from a fares database and generating a plurality of fare lists; and
- merging the plurality of fare lists into a final list of fares and outputting the final list of fares as a response to the received fare inquiry.

5. The method of claim 4, where executing the data collection sub-process comprises, for each of the plurality of parallel data collection sub-processes:

- retrieving, from one rule category sequence, a list of corresponding fare keys;
- for each fare key, retrieving a fare and associated fare application entity and merging matching rule category sequences to form a fare record;

- matching each fare record with corresponding rule category and rule provision data corresponding to the at least one rule attribute;
- matching each fare record sequence against the rule category sequences and retaining those fare records previously identified during the first search; and
- retrieving rule provision data corresponding to the rule category sequence data and matching the rule category sequence data against the fare record and rules attribute and storing in a fare list only those fare records where a match occurs, where the plurality of parallel data collection sub-processes operate on disjoint data domains to avoid performing redundant operations.

6. The method of claim 5, where merging the plurality of fare lists comprises merging the fare list output from each of the plurality of parallel data collection sub-processes into the final fare list by sorting and removing duplicate fare records.

7. The method of any of claim 1 to 6, where performing the first search to determine the rule data comprises using direct matching of functional indices representing decoded rule-specific data and is performed using a data scanning accelerator to provide a direct association between rules attributes and rules.

8. A non-transitory computer-readable medium that contains software program instructions, where execution of the software program instructions by at least one data processor results in performance of operations that comprise execution of the method of any one of claims 1 through 7.

9. A data processing system comprising:
- at least one data processor;
- at least one memory connected with the data processor and storing computer software that is executable by the at least one data processor;
- at least one database storing a plurality of fares and rules establishing conditions under which at least one of the fares can be applied; and
- an interface to at least one user and configured to receive from the user a fare inquiry;
- characterized in that the data processor is configured with the computer software to cause the data processing system to receive a fare inquiry that contains at least one rule attribute, to perform a first search to determine rule data applicable to the

at least one rule attribute, and to perform a second search using the rule data to retrieve a list of fares that are applicable to the rule data,

and the data processor is further configured with the computer software to cause the data processing system to perform the second search as *N* search processes that are executed in parallel, and where the determined list of fares is a merged list obtained from a list output from each of the *N* search processes.

10. The data processing system as in claim 9, where a value of *N* is determined based on a number of rules identified during the first search and on a set of predetermined thresholds, and where *N* is an integer equal to one or greater than one.

11. The data processing system as in any of claim 9 or 10, where the data processor is further configured with the computer software to cause the data processing system to perform the first search by executing an edit sub-process for retrieving rules in accordance with restrictive rules attributes and obtaining associated rule categories and rule provisions and by executing a pre-data collection sub-process where each retrieved rule is filtered to remove rules that are not applicable and storing surviving rules.

12. The data processing system as in claim 11, where the data processor is further configured with the computer software to cause the data processing system to perform the second search by executing a data collection sub-process as a plurality of parallel data collection sub-processes to retrieve, for each surviving rule, fares from a fares database and generating a plurality of fare lists by merging the plurality of fare lists into a final list of fares and outputting the final list of fares as a response to the received fare inquiry.

13. The data processing system as in claim 12, where the data processor is further configured with the computer software to cause the data processing system to execute the data collection sub-process, for each of the plurality of parallel data collection sub-processes, by retrieving, from one rule category sequence, a list of corresponding fare keys; for each fare key, retrieving a fare and associated fare application entity and merging matching rule category sequences to form a fare record; matching each fare record with corresponding rule category and rule provision data corresponding to the at least one rule attribute; matching each fare record sequence against the rule category sequences and retaining those fare records previously

identified during the first search; and retrieving rule provision data corresponding to the rule category sequence data and matching the rule category sequence data against the fare record and rules attribute and storing in a fare list only those fare records where a match occurs, where the plurality of parallel data collection sub-processes operate on disjoint data domains to avoid performing redundant operations.

14. The data processing system as in claim 13, where the data processor is further configured with the computer software to cause the data processing system to perform the merging of the plurality of fare lists comprises merging the fare list output from each of the plurality of parallel data collection sub-processes into the final fare list by sorting and removing duplicate fare records.

15. The data processing system as in any of claim 9 to 14, where the data processor is further configured with the computer software to cause the data processing system to perform the first search to determine the rule data by using direct matching of functional indices representing decoded rule-specific data using a data scanning accelerator to provide a direct association between rules attributes and rules.

CLAIMS

1. A computer-implemented method to retrieve at least one fare, from at least one database storing a plurality of fares each consisting in a set of information giving the price of a travel from a given origin location to a destination location, and rules establishing conditions under which at least one of the fares can be applied, characterized in that it comprises:

- receiving a fare inquiry that specifies at least one rule attribute of said rules and wherein the fare inquiry does not comprise any itinerary information;

- performing a first search to determine rule data applicable to the at least one rule attribute and identifying a plurality of eligible rules from the rules; and

- performing a second search using the plurality of eligible rules to determine a list of fares that are applicable to the rule data,

wherein the second search is performed as *N* search processes that are executed in parallel, and where the determined list of fares is a merged list obtained from a list output from each of the *N* search processes.

2. The method of claim 1, where a value of *N* is determined based on a number of rules identified during the first search and on a set of predetermined thresholds, and where *N* is an integer equal to one or greater than one.

3. The method of any one of claim 1 or 2, where performing the first search comprises:

- executing an edit sub-process for retrieving rules in accordance with restrictive rules attributes and obtaining associated rule categories and rule provisions; and

- executing a pre-data collection sub-process where each retrieved rule is filtered to remove rules that are not applicable and storing surviving rules.

4. The method of claim 3, where performing the second search comprises:

- executing a data collection sub-process as a plurality of parallel data collection sub-processes to retrieve, for each surviving rule, fares from a fares database and generating a plurality of fare lists; and

- merging the plurality of fare lists into a final list of fares and outputting the final list of fares as a response to the received fare inquiry.

5. The method of claim 4, where executing the data collection sub-process comprises, for each of the plurality of parallel data collection sub-processes:

- retrieving, from one rule category sequence, a list of corresponding fare keys;

- for each fare key, retrieving a fare and associated fare application entity and merging matching rule category sequences to form a fare record;

- matching each fare record with corresponding rule category and rule provision data corresponding to the at least one rule attribute;

- matching each fare record sequence against the rule category sequences and retaining those fare records previously identified during the first search; and

- retrieving rule provision data corresponding to the rule category sequence data and matching the rule category sequence data against the fare record and rules attribute and storing in a fare list only those fare records where a match occurs, where the plurality of parallel data collection sub-processes operate on disjoint data domains to avoid performing redundant operations.

6. The method of claim 5, where merging the plurality of fare lists comprises merging the fare list output from each of the plurality of parallel data collection subprocesses into the final fare list by sorting and removing duplicate fare records.

7. The method of any one of claims 1 to 6, where performing the first search to determine the rule data comprises using direct matching of functional indices representing decoded rule-specific data and is performed using a data scanning accelerator to provide a direct association between rules attributes and rules.

8. A non-transitory computer-readable medium that contains software program instructions, where execution of the software program instructions by at least one data processor results in performance of operations that comprise execution of the method of any one of claims 1 through 7.

9. A data processing system comprising:

- at least one data processor;

- at least one memory connected with the data processor and storing computer software that is executable by the at least one data processor;

- at least one database storing a plurality of fares and rules establishing conditions under which at least one of the fares can be applied; and

- an interface to at least one user and configured to receive from the user a fare inquiry;

- characterized in that the data processor is configured with the computer software to cause the data processing system to receive a fare inquiry that contains at least one rule attribute, to perform a first search to determine rule data applicable to the at least one rule attribute, and to perform a second search using the rule data to retrieve a list of fares that are applicable to the rule data,

- and the data processor is further configured with the computer software to cause the data processing system to perform the second search as *N* search processes that are executed in parallel, and where the determined list of fares is a merged list obtained from a list output from each of the *N* search processes.

10. The data processing system as in claim 9, where a value of *N* is determined based on a number of rules identified during the first search and on a set of predetermined thresholds, and where *N* is an integer equal to one or greater than one.

11. The data processing system as in any one of claims 9 or 10, where the data processor is further configured with the computer software to cause the data processing system to perform the first search by executing an edit sub-process

for retrieving rules in accordance with restrictive rules attributes and obtaining associated rule categories and rule provisions and by executing a pre-data collection sub-process where each retrieved rule is filtered to remove rules that are not applicable and storing surviving rules.

12. The data processing system as in claim 11, where the data processor is further configured with the computer software to cause the data processing system to perform the second search by executing a data collection sub-process as a plurality of parallel data collection sub-processes to retrieve, for each surviving rule, fares from a fares database and generating a plurality of fare lists by merging the plurality of fare lists into a final list of fares and outputting the final list of fares as a response to the received fare inquiry.

13. The data processing system as in claim 12, where the data processor is further configured with the computer software to cause the data processing system to execute the data collection sub-process, for each of the plurality of parallel data collection sub-processes, by retrieving, from one rule category sequence, a list of corresponding fare keys; for each fare key, retrieving a fare and associated fare application entity and merging matching rule category sequences to form a fare record matching each fare record with corresponding rule category and rule provision data corresponding to the at least one rule attribute; matching each fare record sequence against the rule category sequences and retaining those fare records previously identified during the first search; and retrieving rule provision data corresponding to the rule category sequence data and matching the rule category sequence data against the fare record and rules attribute and storing in a fare list only those fare records where a match occurs, where the plurality of parallel data collection sub-processes operate on disjoint data domains to avoid performing redundant operations.

14. The data processing system as in claim 13, where the data processor is further configured with the computer software to cause the data processing system to perform the merging of the plurality of fare lists comprises merging the

fare list output from each of the plurality of parallel data collection sub-processes into the final fare list by sorting and removing duplicate fare records.

15. The data processing system as in any one of claims 9 to 14, where the data processor is further configured with the computer software to cause the data processing system to perform the first search to determine the rule data by using direct matching of functional indices representing decoded rule-specific data using a data scanning accelerator to provide a direct association between rules attributes and rules.