

What is claimed is:

1. A computing system for applying a rule to data from one or more data sources, the computing system including:

an input device or port configured to receive data from a first data source;

at least one processor configured to process a plurality of data units derived at least in part from the data received from the first data source in a selected one of at least two different modes of applying the rule, the modes including:

a first mode in which the plurality of data units are received in a particular order, and processing the plurality of data units includes, for each of at least some of the plurality of data units, writing an updated value to at least one state variable based on a result of applying the rule to the data unit; and

a second mode in which a selection of particular data unit of the plurality of data units is received, and processing the particular data unit includes: (1) determining a first set of data units that includes an ordered subset of data units from the plurality of data units, each data unit included in the ordered subset occurring before the particular data unit in the plurality of data units, (2) prior to applying the rule to the particular data unit, updating at least one state variable to a state that would result from processing the first set of data units in the first mode, and (3) applying the rule to the particular data unit including reading the updated value of the state variable, where a result of applying the rule to the particular data unit depends on the updated value of the state variable.

2. Software stored in a non-transitory form on a computer-readable medium, for applying a rule to data from one or more data sources, the software including instructions for causing a computing system to:

receive data from a first data source;

process, using at least one processor, a plurality of data units derived at least in part from the data received from the first data source in a selected one

of at least two different modes of applying the rule, the modes including:

- a first mode in which the plurality of data units are received in a particular order, and processing the plurality of data units includes, for each of at least some of the plurality of data units, writing an updated value to at least one state variable based on a result of applying the rule to the data unit; and
- a second mode in which a selection of particular data unit of the plurality of data units is received, and processing the particular data unit includes: (1) determining a first set of data units that includes an ordered subset of data units from the plurality of data units, each data unit included in the ordered subset occurring before the particular data unit in the plurality of data units, (2) prior to applying the rule to the particular data unit, updating at least one state variable to a state that would result from processing the first set of data units in the first mode, and (3) applying the rule to the particular data unit including reading the updated value of the state variable, where a result of applying the rule to the particular data unit depends on the updated value of the state variable.

3. A method for applying a rule to data from one or more data sources, the method including:

receiving data from a first data source;

processing, using at least one processor, a plurality of data units derived at least in part from the data received from the first data source in a selected one of at least two different modes of applying the rule, the modes including:

- a first mode in which the plurality of data units are received in a particular order, and processing the plurality of data units includes, for each of at least some of the plurality of data units, writing an updated value to at least one state variable based on a result of applying the rule to the data unit; and

a second mode in which a selection of particular data unit of the plurality of data units is received, and processing the particular data unit includes: (1) determining a first set of data units that includes an ordered subset of data units from the plurality of data units, each data unit included in the ordered subset occurring before the particular data unit in the plurality of data units, (2) prior to applying the rule to the particular data unit, updating at least one state variable to a state that would result from processing the first set of data units in the first mode, and (3) applying the rule to the particular data unit including reading the updated value of the state variable, where a result of applying the rule to the particular data unit depends on the updated value of the state variable.

4. The computing system of claim 1, the software of claim 2, or the method of claim 3, wherein the second mode is a mode of applying the rule to data from one or more data sources in a testing environment in which the particular data unit is selected within a user interface for testing the rule.

5. The computing system of claim 4, the software of claim 4, or the method of claim 4, wherein the first mode is a mode of applying the rule to data from one or more data sources in a production environment.

6. The computing system of claim 4, the software of claim 4, or the method of claim 4, wherein the first mode is a mode of applying the rule to data from one or more data sources in the testing environment in which all of the plurality of data units are tested in a batch.

7. The computing system of claim 1, the software of claim 2, or the method of claim 3, wherein updating the state variable includes iterating in order through the first set of data units and, for each data unit of the ordered subset, applying the rule to the data unit and writing an updated value of the state variable based on a result of applying the rule to the data unit.

8. The computing system of claim 7, the software of claim 7, or the method of claim 7, wherein the first set of data units includes data units not in the ordered subset of data units, and iterating in order through the first set of data units includes determining if a data unit is a member of the ordered subset of data units.

9. The computing system of claim 1, the software of claim 2, or the method of claim 3, wherein each data unit included in the ordered subset is related to the particular data unit, and the plurality of data units includes a related data unit that is a first occurrence of a data unit related to the particular data unit in the plurality of data units, and an initial data unit of the ordered subset of data units is a data unit other than the related data unit.

10. The computing system of claim 9, the software of claim 9, or the method of claim 9, wherein processing the particular data unit in the second mode further includes storing the updated values of the state variable for each application of the rule to data units of the plurality of data units in a state variable cache.

11. The computing system of claim 10, the software of claim 10, or the method of claim 10, wherein applying the rule to the initial data unit of the ordered subset of data units includes reading an updated value of the state variable that was stored in response to application of the rule to a data unit occurring before the initial data unit in the plurality of data units from the state variable cache.

12. The computing system of claim 11, the software of claim 11, or the method of claim 11, wherein the data unit occurring before the initial data unit in the plurality of data units is the nearest data unit related to the initial data unit and occurring before the initial data unit in the plurality of data units.

13. The computing system of claim 1, the software of claim 2, or the method of claim 3, wherein each data unit included in the ordered subset is related to the particular data unit, and to the other data units of the ordered subset of data units, by a shared identifier.

14. The computing system of claim 13, wherein the shared identifier includes a key field value.
15. The computing system of claim 1 wherein the first set of data units consists of the ordered subset of data units.
16. The computing system of claim 1 wherein the rule includes a plurality of rule cases.
17. The computing system of claim 16 wherein a result of testing at least one rule case of the plurality of rule cases depends on the value of the state variable.
18. The computing system of claim 17 wherein applying the rule to the particular data unit of the plurality of data units includes testing the at least one rule case of the plurality of rule cases against the updated value of the state variable.
19. The computing system of claim 16 wherein each data unit included in the ordered subset is related to the particular data unit, and an initial data unit of the ordered subset of data units is a first occurrence of a data unit related to the particular data unit in the plurality of data units.
20. The computing system of claim 19 wherein at least one rule case of the plurality of rule cases is based on a value derived from a second data source that is different from the first data source.
21. The computing system of claim 20 wherein the second data source is dynamically accessed after beginning of the processing.
22. The computing system of claim 20 wherein each data unit of the plurality of data units includes one or more values from a record of the first data source, and at least one value from the second data source.
23. The computing system of claim 22 wherein the plurality of data units are ordered according to an order of a set of records of the first data source.

24. The computing system of claim 1 wherein processing the particular data unit includes determining whether one or more previously obtained values for the particular data unit exist in a data unit cache and are valid, and if the previously obtained values are determined to exist and to be valid, obtaining one or more values for the particular data unit from the data unit cache, otherwise obtaining one or more values for the particular data unit from one or more data sources including the first data source.

25. The computing system of claim 24 wherein determining whether the previously obtained values for the particular data unit are valid includes comparing an elapsed time since the previously obtained values were obtained to a predetermined elapsed time threshold.

26. The computing system of claim 24 wherein obtaining one or more values for the particular data unit from the one or more data sources includes opening a connection to the first data source for receiving one or more values for the particular data unit and maintaining the connection in an open state for receiving one or more values for other data units of the plurality of data units.

27. The computing system of claim 24 wherein obtaining one or more values for the particular data unit from the one or more data sources includes receiving one or more values for the particular data unit from a previously opened connection to the first data source.

28. The computing system of claim 1 wherein the first data source is a database.

29. The computing system of claim 1 wherein the first data source is a data archive file.

30. The computing system of claim 1 wherein processing the particular data unit in the second mode further includes, for at least a first data unit of the ordered subset, determining whether previously obtained values for the first data unit exist in a data unit cache and are valid, and if the previously obtained values are determined to exist

and to be valid, obtaining one or more values for the first data unit from the data unit cache, otherwise obtaining one or more values for the first data unit from one or more data sources including the first data source.

31. The computing system of claim 30 wherein determining whether the previously obtained values for the first data unit are valid includes comparing an elapsed time since the previously obtained values were obtained to a predetermined elapsed time threshold.

32. The computing system of claim 1 wherein obtaining one or more values for the first data unit from the one or more data sources includes opening a connection to the first data source for receiving one or more values for the first data unit and maintaining the connection in an open state for receiving one or more values for other data units of the plurality of data units.

33. The computing system of claim 1 wherein obtaining one or more values for the first data unit from the one or more data sources includes receiving one or more values for the first data unit from a previously opened connection to the first data source.

34. A computing system for applying a rule to data from one or more data sources, the computing system including:

- means for receiving data from a first data source;

- means for processing a plurality of data units derived at least in part from the data received from the first data source in a selected one of at least two different modes of applying the rule, the modes including:

- a first mode in which the plurality of data units are received in a particular order, and processing the plurality of data units includes, for each of at least some of the plurality of data units, writing an updated value to at least one state variable based on a result of applying the rule to the data unit; and

- a second mode in which a selection of particular data unit of the plurality of data units is received, and processing the particular data unit includes: (1) determining a first set of data units that

includes an ordered subset of data units from the plurality of data units, each data unit included in the ordered subset occurring before the particular data unit in the plurality of data units, (2) prior to applying the rule to the particular data unit, updating at least one state variable to a state that would result from processing the first set of data units in the first mode, and (3) applying the rule to the particular data unit including reading the updated value of the state variable, where a result of applying the rule to the particular data unit depends on the updated value of the state variable.