CLAIMS

1. A method, comprising:

providing an accounting system in a cloud computing environment, the cloud computing environment providing the accounting system by a primary data center in an online state and comprising one or more pods, each pod comprising processor hardware and memory hardware and including one or more application server virtual machines that are specific to the pod, and in case of a fault in the primary data center, the cloud computing environment providing the accounting system by a secondary data center in an online state, the secondary data center comprising one or more pods to which the one or more pods of the primary data center are replicated, respectively;

while the primary data center is in an online state, maintaining the secondary data center in an offline state in which energy consumption is reduced relative to power consumption in the online state of the secondary data center; and

in response to the primary data center developing a fault, changing a state of the secondary data center from the offline state to an online state in which the secondary data center is providing the cloud computing environment, and changing a state of the primary data center to an offline state;

at the accounting system, receiving, from a financial system, an authorization to link a financial account at the financial system with a bookkeeping account at the accounting system running in the cloud computing environment, the accounting system maintaining bookkeeping accounts for a plurality of entities, the authorization identifying a first user associated with a first entity of the plurality of entities;

based on the receiving of the authorization identifying the first user, linking the bookkeeping account associated with the first entity to the authorized financial account;

registering, by the accounting system running in the cloud computing environment, for a bank record feed from the financial system, the registering using the authorization from the financial system;

responsive to the registering for the bank record feed, receiving financial account data related to the financial account from the financial system;

generating accounting data related to the bookkeeping account using the financial account data;

storing the accounting data in a database;

accessing, by one or more pods of the cloud computing environment and via a network connection, the accounting data stored on the database, the accounting data comprising information about posted transactions that have been exchanged between a second set of entities, each transaction including a sending entity and a receiving entity;

dynamically generating, by the accounting system running in the cloud computing environment, a second set of performance values for each entity of the second set of entities based on the accounting data, wherein dynamically generating the second set of performance values comprises automatically updating the second set of performance values as new posted transactions are received by the database;

for each entity of the second set of entities, dynamically generating an action score based on at least one performance value of the second set of performance values, wherein dynamically generating the action score comprises automatically updating the action score as the at least one performance value of the second set of performance values is updated;

causing presentation of a graphical user interface (GUI) on a display device corresponding to a user account of the accounting system, the GUI configured to provide an indication of probabilities of late payment for incoming payments by related entities of the first entity;

receiving, from a second user of the user account via the GUI, a request for one or more action probabilities associated with the first entity regarding an event;

automatically determining which related entities are associated with the event, wherein the related entities are entities of the second set of entities;

providing, to a trained machine-learning model, an action score for each of the related entities;

generating, by the trained machine-learning model, one or more action probabilities associated with each of the related entities; and

automatically causing presentation of the one or more action probabilities for each of the related entities within the GUI of the display device, the presentation of the action probabilities comprising probabilities of late payment for incoming payments.

2. The method of claim 1, wherein generating the action score for the first entity further comprises:

tracking the posted transactions of the first entity with other entities;

evaluating a performance of the first entity with reference to the event based on the posted transactions of the first entity with other entities; and

calculating the action score for the event based on the evaluated performance.

3. The method of claim 2, wherein the action score is a network predictive cashflow (NPC), wherein the posted transactions include payments made by the other entities, wherein evaluating the performance comprises analyzing a history of payments by the other entities, the method further comprising:

calculating a predicted cash flow for the first entity for a predetermined time period based on the history of payments of the other entities; and

causing presentation of the predicted cash flow on the GUI.

4. The method of any one of the preceding claims, wherein causing presentation of the action probabilities further comprises:

identifying groups of related entities based on values of the action probabilities; and

presenting the action probabilities according to the identified groups.

5. The method of any one of the preceding claims, wherein the receiving the request comprises:

receiving a request from an institution for the action score of the first entity;

transmitting the action score to the institution; and

determining, by the institution, a risk for a loan to the first entity based on the action score of the first entity.

6. The method of any one of the preceding claims,, further comprising:

calculating a second action score for the first entity based on a second event; and

calculating a third action score for the first entity based on the action score and the second action score.

7. The method of any one of the preceding claims, further comprising:

generating a response recommendation based on the action probabilities; and

causing presentation of the response recommendation in the GUI.

8. The method of any one of the preceding claims, wherein the GUI further comprises a chart for payments in upcoming months, wherein a probability of late action is presented for each month, the probability of late action being presented according to a plurality of risk levels for late payment.

9. The method of any one of the preceding claims, wherein the GUI further comprises a chart for weekly receivables based on the action probabilities for each receivable item.

10. The method of any one of the preceding claims, wherein the machine-learning model comprises one or more of: Multinomial Naive Bayes (MNB), Support Vector Machines (SVM), multinomial Logistic Regression (LR), Random Forest (RF), neural networks (NN), and matrix factorization.

11. The method of any one of the preceding claims, further comprising:

verifying the action probabilities by determining an indication of validity of the action scores, wherein determining the indication of validity comprises:

determining patterns of behavior for one or more of the second set of entities by generating a model representative of corresponding times, types of financial transaction data and vendor data entered into the accounting system by the respective entity of the second set of entities;

determining an attempt to optimize scoring by identifying variations in the patterns of behavior that fall outside of a predetermined threshold; and

determining the indication of validity of the action scores based on the determination of the attempt to optimize;

wherein, responsive to determining that the indication of validity is indicative of a change in a pattern of behavior, preventing the generation of a subsequent respective one or more action scores until such time as the action score is validated, and preventing the presentation of a subsequent respective one or more action probabilities in the GUI.

12. The method of any one of the preceding claims, further comprising:

training, by one or more processors of a system, a machine-learning model to determine one or more action probabilities associated with the first entity of a first set of entities regarding an event, each action probability of the one of one or more action probabilities being a probability that a second entity of the first set of entities responds to the event associated with the first entity within a predetermined time frame, wherein the training comprises:

identifying one or more features, wherein the one or more features comprise an action score of the second entity, wherein the action score is a payment history metric providing an indication of past performance of the second entity as a sending entity for performing transactions before a time deadline with respect to a set of performance values, wherein the set of performance values are derived from information about posted transactions that have been exchanged between the first set of entities, each transaction including a sending entity and a receiving entity;

determining training data, wherein the training data comprises historical values for the one or more features;

providing the one or more features and the training data to the machine-learning model as training data; and

appraising values of the one or more features as they correlate to the training data to provide the trained machine-learning model.

13. A first system comprising:

a cloud computing environment providing an accounting system, the cloud computing environment providing the accounting system by a primary data center in an online state and comprising one or more pods, each pod comprising processor hardware and memory hardware and including one or more application server virtual machines that are specific to the pod, and in case of a fault in the primary data center, the cloud computing environment providing the accounting system by a secondary data center in an online state, the secondary data center comprising one or more pods to which the one or more pods of the primary data center are replicated, respectively;

wherein, while the primary data center is in an online state, the cloud computing environment is configured for maintaining the secondary data center in an offline state in which energy consumption is reduced relative to power consumption in the online state of the secondary data center; and

wherein the cloud computing environment is configured for:

in response to the primary data center developing a fault, changing a state of the secondary data center from the offline state to an online state in which the secondary data center is providing the cloud computing environment; and changing a state of the primary data center to an offline state;

at least one of the pods at the primary data center and at least one of the pods at the secondary data center comprising instructions, and one or more computer processors, wherein the instructions, when executed by the one or more computer processors, cause the one or more computer processors to perform operations comprising:

receiving, from a financial system, an authorization to link a financial account at the financial system with a bookkeeping account at the accounting system running in the cloud computing environment, the accounting system maintaining bookkeeping accounts for a plurality of entities, the authorization identifying a first user associated with a first entity of the plurality of entities;

based on the receiving of the authorization identifying the first user, linking the bookkeeping account associated with the first entity to the authorized financial account;

registering, by the accounting system running in the cloud computing environment, for a bank record feed from the financial system, the registering using the authorization from the financial system;

responsive to the registering for the bank record feed, receiving financial account data related to the financial account from the financial system;

generating accounting data related to the bookkeeping account using the financial account data;

storing the accounting data in a database;

accessing, by one or more pods of the cloud computing environment and via a network connection, accounting data stored on the database, the accounting data comprising information about posted transactions that have been exchanged between a second set of entities, each transaction including a sending entity and a receiving entity;

dynamically generating, by the accounting system running in the cloud computing environment, a second set of performance values for each entity of the second set of entities based on the accounting data, wherein dynamically generating the second set of performance values comprises automatically updating the second set of performance values as new posted transactions are received by the database;

for each entity of the second set of entities, dynamically generating an action score based on at least one performance value of the second set of performance values, wherein dynamically generating the action score comprises automatically updating the action score as the at least one performance value of the second set of performance values is updated;

causing presentation of a graphical user interface (GUI) on a display device corresponding to a user account of the accounting system, the GUI configured to provide an indication of probabilities of late payment for incoming payments by related entities of the first entity;

receiving, from a second user of the user account via the GUI, a request for one or more action probabilities associated with the first entity regarding an event;

automatically determining which related entities are associated with the event, wherein the related entities are entities of the second set of entities;

providing, to a trained machine-learning model, an action score for each of the related entities;

generating, by the trained machine-learning model, one or more action probabilities associated with each of the related entities; and

automatically causing presentation of the one or more action probabilities for each of the related entities within the GUI of the display device, the presentation of the action probabilities comprising probabilities of late payment for incoming payments.

14. The first system of claim 13, wherein generating the action score for the first entity further comprises:

tracking the posted transactions of the first entity with other entities;

evaluating a performance of the first entity with reference to the event based on the posted transactions of the first entity with other entities; and

calculating the action score for the event based on the evaluated performance.

15. The first system of claim 14, wherein the action score is a network predictive cashflow (NPC), wherein the posted transactions include payments made by the other entities, wherein evaluating the performance comprises analyzing a history of payments by the other entities, wherein the one or more computer processors further perform operations comprising:

calculating a cash flow for the first entity for a predetermined time period based on the history of payments of the other entities; and

causing presentation of the cash flow on the GUI.

16. The first system of any one of claims 13 to 15, wherein causing presentation of the action probabilities further comprises:

identifying groups of related entities based on values of the action probabilities; and

presenting the action probabilities according to the identified groups.

17. The first system as recited in in any one of claims 13 to 16, wherein the instructions further cause the one or more computer processors to perform operations comprising:

receiving a request from an institution for the action score of the first entity;

transmitting the action score to the institution; and

determining, by the institution, a risk for a loan to the first entity based on the action score of the first entity.

18. The first system of any one of claims 13 to 17, further comprising:

a second system comprising a memory comprising instructions; and one or more computer processors, wherein the instructions, when executed by the one or more computer processors, cause the one or more computer processors to perform operations comprising:

training, by one or more processors of system, a machine-learning model to determine one or more action probabilities associated with a first entity of a first set of entities regarding an event, each action probability of the one of one or more action probabilities being a probability that a second entity of the first set of entities responds to the event associated with the first entity within a predetermined time frame, wherein the training comprises:

identifying one or more features, wherein the one or more features comprise an action score of the second entity, wherein the action score is a payment history metric providing an

indication of past performance of the second entity as a sending entity for performing transactions before a time deadline with respect to a set of performance values, wherein the set of performance values are derived from information about posted transactions that have been exchanged between the first set of entities, each transaction including a sending entity and a receiving entity;

determining training data, wherein the training data comprises historical values for the one or more features;

providing the one or more features and the training data to the machine-learning model as training data; and

appraising values of the one or more features as they correlate to the training data to provide the trained machine-learning model.

19. A non-transitory machine-readable storage medium including instructions that, when executed by a machine, cause the machine to perform operations comprising:

providing an accounting system in a cloud computing environment, the cloud computing environment providing the accounting system by a primary data center in an online state and comprising one or more pods, each pod comprising processor hardware and memory hardware and including one or more application server virtual machines that are specific to the pod, and in case of a fault in the primary data center, the cloud computing environment providing the accounting system by a secondary data center in an online state, the secondary data center comprising one or more pods to which the one or more pods of the primary data center are replicated, respectively;

while the primary data center is in an online state, maintaining the secondary data center in an offline state in which energy consumption is reduced relative to power consumption in the online state of the secondary data center; and

in response to the primary data center developing a fault, changing a state of the secondary data center from the offline state to an online state in which the secondary data center is providing the cloud computing environment, and changing a state of the primary data center to an offline state;

at the accounting system, receiving, from a financial system, an authorization to link a financial account at the financial system with a bookkeeping account at the accounting system running in the cloud computing environment, the accounting system maintaining

bookkeeping accounts for a plurality of entities, the authorization identifying a first user associated with a first entity of the plurality of entities;

based on the receiving of the authorization identifying the first user, linking the bookkeeping account associated with the first entity to the authorized financial account;

registering, by the accounting system running in the cloud computing environment, for a bank record feed from the financial system, the registering using the authorization from the financial system;

responsive to the registering for the bank record feed, receiving financial account data related to the financial account from the financial system;

generating accounting data related to the bookkeeping account using the financial account data;

storing the accounting data in a database;

accessing, by one or more pods of the cloud computing environment and via a network connection, the accounting data stored on the database, the accounting data comprising information about posted transactions that have been exchanged between a second set of entities, each transaction including a sending entity and a receiving entity;

dynamically generating, by the accounting system running in the cloud computing environment, a second set of performance values for each entity of the second set of entities based on the accounting data, wherein dynamically generating the second set of performance values comprises automatically updating the second set of performance values as new posted transactions are received by the database;

for each entity of the second set of entities, dynamically generating an action score based on at least one performance value of the second set of performance values, wherein

dynamically generating the action score comprises automatically updating the action score as the at least one performance value of the second set of performance values is updated;

causing presentation of a graphical user interface (GUI) on a display device corresponding to a user account of the accounting system, the GUI configured to provide an indication of probabilities of late payment for incoming payments by related entities of the first entity;

receiving, from a second user of the user account via the GUI, a request for one or more action probabilities associated with the first entity regarding an event;

automatically determining which related entities are associated with the event, wherein the related entities are entities of the second set of entities;

providing, to a trained machine-learning model, an action score for each of the related entities;

generating, by the trained machine-learning model, one or more action probabilities associated with each of the related entities; and

automatically causing presentation of the one or more action probabilities for each of the related entities within the GUI of the display device, the presentation of the action probabilities comprising probabilities of late payment for incoming payments.

20. The machine-readable storage medium of claim 19, wherein the instructions further cause the machine to perform operations comprising:

training, by one or more processors of a system, a machine-learning model to determine one or more action probabilities associated with the first entity of a first set of entities regarding an event, each action probability of the one of one or more action probabilities being a probability that a second entity of the first set of entities responds to the event associated with the first entity within a predetermined time frame, wherein the training comprises:

identifying one or more features, wherein the one or more features comprise an action score of the second entity, wherein the action score is a payment history metric providing an indication of past performance of the second entity as a sending entity for performing transactions before a time deadline with respect to a set of performance values, wherein the set of performance values are derived from information about posted transactions that have been exchanged between the first set of entities, each transaction including a sending entity and a receiving entity;

determining training data, wherein the training data comprises historical values for the one or more features;

providing the one or more features and the training data to the machine-learning model as training data; and

appraising values of the one or more features as they correlate to the training data to provide the trained machine-learning model.