

CLAIMS

We claim:

1. A computer-implemented method for generating a set of trade finance digital objects, comprising:
 - 5 acquiring, by a computing device having one or more processors, a set of trade finance documents, each of the trade finance documents comprising a record of a financial arrangement between a first party and a second party, wherein each of the trade finance documents contains data that identifies the first party, the second party, and a set of terms and conditions of the financial arrangement;
 - 10 analyzing, by the computing device and utilizing a document type model, each of the trade finance documents to identify a document type for each of the trade finance documents;
identifying, by the computing device, a template for each of the trade finance documents based on its associated document type, each template specifying one or more possible locations of the data within each of the trade finance documents;
 - 15 parsing, by the computing device and utilizing the identified template, each of the trade finance documents with a parser to extract at least a portion of the data from each of the trade finance documents;
transforming, by the computing device, the extracted portion of the data to generate the set of trade finance digital objects corresponding to the trade finance documents, each of the
 - 20 trade finance digital objects comprising an electronic replication of the extracted portion of the data that aligns with a trade finance data object model; and
storing, by the computing device, the set of trade finance digital objects.
2. The computer-implemented method of claim 1, wherein the document type comprises one of an invoice, a purchase order, a bank guarantee, a letter of credit, an insurance certificate,
 - 25 a bill of lading, a logistics document, a customs document, an air waybill, a certificate of origin, an inspection certificate, a bill of exchange, an import declaration, an export declaration, a packing list, a bank payment obligation, and a letter of indemnity.
3. The computer-implemented method of claim 1, wherein storing the set of trade finance digital objects comprises recording each of the trade finance digital objects on a distributed
 - 30 ledger.

4. The computer-implemented method of claim 3, wherein the distributed ledger comprises a blockchain.
5. The computer-implemented method of claim 1, wherein the document type model is a classification model.
- 5 6. The computer-implemented method of claim 1, wherein the template for each of the trade finance documents is identified from a set of document templates generated via a machine learning algorithm.
7. The computer-implemented method of claim 6, wherein the machine learning algorithm is trained via a supervised learning process.
- 10 8. The computer-implemented method of claim 1, wherein the template for each of the trade finance documents is identified from a set of manually generated document templates.
9. The computer-implemented method of claim 1, wherein acquiring the set of trade finance documents comprises scanning physical copies of the trade finance documents.
10. The computer-implemented method of claim 1, wherein acquiring the set of trade
15 finance documents comprises receiving electronic versions of the trade finance documents.
11. The computer-implemented method of claim 1, wherein the trade finance data object model specifies a set of features for defining the trade finance digital objects.
12. The computer-implemented method of claim 11, wherein the set of features for a particular trade finance digital object is based on the document type of the particular trade
20 finance digital object.
13. The computer-implemented method of claim 1, further comprising performing, by the computing device, an automated data validation process to validate each of the set of trade finance digital objects.

14. The computer-implemented method of claim 13, wherein the automated data validation process comprises:
- generating a validation score corresponding to each of the set of trade finance digital objects, the validation score representing an accuracy and/or completeness of the electronic replication;
- 5 comparing the validation score to a threshold; and
- when the validation score satisfies the threshold, validating its corresponding trade finance digital object of the set of trade finance digital objects.
15. The computer-implemented method of claim 14, further comprising, when the validation score does not satisfy the threshold, designating its corresponding trade finance digital object of the set of trade finance digital objects as in need of further processing.
16. The computer-implemented method of claim 15, wherein further processing comprises initiating a manual review of its corresponding trade finance document and trade finance digital object.
- 15 17. A computing system for generating a set of trade finance digital objects, comprising:
- one or more processors; and
- a non-transitory computer-readable storage medium having a plurality of instructions stored thereon, which, when executed by the one or more processors, cause the one or more processors to perform operations comprising:
- 20 acquiring a set of trade finance documents, each of the trade finance documents comprising a record of a financial arrangement between a first party and a second party, wherein each of the trade finance documents contains data that identifies the first party, the second party, and a set of terms and conditions of the financial arrangement;
- analyzing, utilizing a document type model, each of the trade finance documents to identify a document type for each of the trade finance documents;
- 25 identifying a template for each of the trade finance documents based on its associated document type, each template specifying one or more possible locations of the data within each of the trade finance documents;

parsing, utilizing the identified template, each of the trade finance documents with a parser to extract at least a portion of the data from each of the trade finance documents;

- 5 transforming the extracted portion of the data to generate the set of trade finance digital objects corresponding to the trade finance documents, each of the trade finance digital objects comprising an electronic replication of the extracted portion of the data that aligns with a trade finance data object model; and
- storing the set of trade finance digital objects.

18. The computing system of claim 17, wherein the document type comprises one of an
10 invoice, a purchase order, a bank guarantee, a letter of credit, an insurance certificate, a bill of lading, a logistics document, a customs document, an air waybill, a certificate of origin, an inspection certificate, a bill of exchange, an import declaration, an export declaration, a packing list, a bank payment obligation, and a letter of indemnity.

19. The computing system of claim 17, wherein storing the set of trade finance digital
15 objects comprises recording each of the trade finance digital objects on a distributed ledger.

20. The computing system of claim 19, wherein the distributed ledger comprises a blockchain.

21. The computing system of claim 17, wherein the document type model is a classification model.

20 22. The computing system of claim 17, wherein the template for each of the trade finance documents is identified from a set of document templates generated via a machine learning algorithm.

23. The computing system of claim 22, wherein the machine learning algorithm is trained via a supervised learning process.

24. The computing system of claim 17, wherein the template for each of the trade finance documents is identified from a set of manually generated document templates.
25. The computing system of claim 17, wherein acquiring the set of trade finance documents comprises scanning physical copies of the trade finance documents.
- 5 26. The computing system of claim 17, wherein acquiring the set of trade finance documents comprises receiving electronic versions of the trade finance documents.
27. The computing system of claim 17, wherein the trade finance data object model specifies a set of features for defining the trade finance digital objects.
28. The computing system of claim 27, wherein the set of features for a particular trade
10 finance digital object is based on the document type of the particular trade finance digital object.
29. The computing system of claim 17, wherein the operations further comprise performing an automated data validation process to validate each of the set of trade finance digital objects.
30. The computing system of claim 29, wherein the automated data validation process
15 comprises:
generating a validation score corresponding to each of the set of trade finance digital objects, the validation score representing an accuracy and/or completeness of the electronic replication;
comparing the validation score to a threshold; and
20 when the validation score satisfies the threshold, validating its corresponding trade finance digital object of the set of trade finance digital objects.
31. The computing system of claim 30, further comprising, when the validation score does not satisfy the threshold, designating its corresponding trade finance digital object of the set of trade finance digital objects as in need of further processing.

32. The computing system of claim 31, wherein further processing comprises initiating a manual review of it corresponding trade finance document and trade finance digital object.
33. A computing device comprising at least one processor and a memory, the computing device implementing a trade finance asset digitization and tracking platform comprising:
- 5 a data digitization engine for generating a set of trade finance digital objects corresponding to a set of trade finance documents of a user, each of the set of trade finance documents comprising a record of a financial arrangement between the user and a second party based on a set of terms and conditions, each of the trade finance digital objects comprising an electronic replication of data of its corresponding trade finance document that aligns with a
- 10 trade finance data object model; and
- a monetization engine for aggregating the set of trade finance digital objects, the monetization engine configured to:
- determine a value for each trade finance digital object based on the electronic replication of the data of its corresponding trade finance document,
- 15 determine a cost to access the value for each trade finance digital object at a particular time, and
- permit the user to transfer ownership of one or more of the trade finance digital objects to another party.
34. The computing device of claim 33, wherein the monetization engine is configured to
- 20 output a ranked list of the set of trade finance digital objects based on the costs to access the value for each trade finance digital object at the particular time.
35. The computing device of claim 34, wherein the ranked list is output on a graphical user interface, and wherein the ranked list is automatically updated by the monetization engine.
36. The computing device of claim 33, wherein the monetization engine determines the
- 25 cost to access the value for each trade finance digital object at the particular time based on the set of terms and conditions of the financial arrangements.

37. The computing device of claim 36, wherein the monetization engine determines the cost to access the value for each trade finance digital object at the particular time for each of a plurality of funding options.
38. The computing device of claim 37, wherein the monetization engine determines the cost to access the value for each trade finance digital object at the particular time for each of the plurality of funding options based on one or more of: (i) historical pricing of a particular funding option, (ii) a time period between the particular time and a maturation date of each trade finance digital object, and (iii) an identity of the second party.
39. The computing device of claim 37, wherein the monetization engine determines the cost to access the value for each trade finance digital object at the particular time for each of the plurality of funding options based on one or more of: (i) historical pricing of a particular funding option, (ii) a time period between the particular time and a maturation date of each trade finance digital object, (iii) an identity of the second party, (iv) a currency exchange rate, and (v) a jurisdiction associated with each trade finance digital object.
40. The computing device of claim 39, wherein the cost to access the value for each trade finance digital object at the particular time for each of the plurality of funding options is further based on a credit rating.
41. The computing device of claim 40, wherein the credit rating corresponds to at least one of the user and the second party.
42. The computing device of claim 33, wherein the trade finance documents of the user comprise an accounts receivable item, an invoice, a purchase order, a bank guarantee, a letter of credit, an insurance certificate, a bank payment obligation, shipping document, or a letter of indemnity.
43. The computing device of claim 33, wherein the monetization engine coordinates the transfer of ownership of one or more of the trade finance digital objects to another party.

44. A computer-implemented method for implementing a trade finance asset digitization and tracking platform, comprising:

- generating, by a data digitization engine of computing device having at least one processor, a set of trade finance digital objects corresponding to a set of trade finance documents of a user, each of the set of trade finance documents comprising a record of a financial arrangement between the user and a second party based on a set of terms and conditions, each of the trade finance digital objects comprising an electronic replication of data of its corresponding trade finance document that aligns with a trade finance data object model; and
- aggregating, by a monetization engine of the computing device, the set of trade finance digital objects;
- determine, by the monetization engine of the computing device, a value for each trade finance digital object based on the electronic replication of the data of its corresponding trade finance document,
- determining, by the monetization engine of the computing device, a cost to access the value for each trade finance digital object at a particular time; and
- permitting, by the monetization engine of the computing device, the user to transfer ownership of one or more of the trade finance digital objects to another party.

45. The computer-implemented method of claim 44, wherein the monetization engine is configured to output a ranked list of the set of trade finance digital objects based on the costs to access the value for each trade finance digital object at the particular time.

46. The computer-implemented method of claim 45, wherein the ranked list is output on a graphical user interface, and wherein the ranked list is automatically updated by the monetization engine.

47. The computer-implemented method of claim 44, wherein the monetization engine determines the cost to access the value for each trade finance digital object at the particular time based on the set of terms and conditions of the financial arrangements.

48. The computer-implemented method of claim 47, wherein the monetization engine determines the cost to access the value for each trade finance digital object at the particular time for each of a plurality of funding options.

49. The computer-implemented method of claim 48, wherein the monetization engine
5 determines the cost to access the value for each trade finance digital object at the particular time for each of the plurality of funding options based on one or more of: (i) historical pricing of a particular funding option, (ii) a time period between the particular time and a maturation date of each trade finance digital object, and (iii) an identity of the second party.

50. The computer-implemented method of claim 48, wherein the monetization engine
10 determines the cost to access the value for each trade finance digital object at the particular time for each of the plurality of funding options based on one or more of: (i) historical pricing of a particular funding option, (ii) a time period between the particular time and a maturation date of each trade finance digital object, (iii) an identity of the second party, (iv) a currency exchange rate, and (v) a jurisdiction associated with each trade finance digital object.

15 51. The computer-implemented method of claim 50, wherein the cost to access the value for each trade finance digital object at the particular time for each of the plurality of funding options is further based on a credit rating.

52. The computer-implemented method of claim 51, wherein the credit rating corresponds to at least one of the user and the second party.

20 53. The computer-implemented method of claim 44, wherein the trade finance documents of the user comprise an accounts receivable item, an invoice, a purchase order, a bank guarantee, a letter of credit, an insurance certificate, a bank payment obligation, shipping document, or a letter of indemnity.

54. The computer-implemented method of claim 44, wherein the monetization engine
25 coordinates the transfer of ownership of one or more of the trade finance digital objects to another party.

55. A computing device comprising at least one processor and a memory, the computing device implementing a trade finance asset digitization and tracking platform comprising:
- a data digitization engine for generating a set of trade finance digital objects corresponding to a set of trade finance documents of a user, each of the set of trade finance documents comprising a record of a financial arrangement between the user and a second party based on a set of terms and conditions, each of the trade finance digital objects comprising an electronic replication of data of its corresponding trade finance document that aligns with a trade finance data object model;
 - a cash forecasting engine for aggregating the set of trade finance digital objects, the cash forecasting engine configured to:
 - determine a liquidity position for the user based on the electronic replication of data of the trade finance documents, and
 - utilize a machine learning model to forecast a cash position of the user at a future date, wherein the machine learning model is trained to detect patterns associated with each of the trade finance digital objects based on historical payment activity of its corresponding party.
56. The computing device of claim 55, wherein the forecast of the cash position of the user is further based on accounts payable information.
57. The computing device of claim 56, wherein the forecast of the cash position of the user is further based on intracompany flow of capital of the user.
58. The computing device of claim 55, wherein the machine learning model is trained to detect a payment delay pattern comprising a time difference between a contracted payment date and an actual payment date from the corresponding party.
59. The computing device of claim 55, wherein the machine learning model is trained to detect a specific day of week pattern comprising a consistent day of week associated with payments from the corresponding party.

60. The computing device of claim 55, wherein the machine learning model is trained to detect a time period of month pattern comprising a consistent time period of month associated with payments from the corresponding party.
61. The computing device of claim 60, wherein the consistent time period of month associated with payments from the corresponding party corresponds to a beginning of the month, a middle of the month, or an end of the month.
62. The computing device of claim 55, wherein the trade finance asset digitization and tracking platform further comprises a validation engine that is used to update the machine learning model.
63. The computing device of claim 62, wherein the validation engine updates the historical payment activity upon which the machine learning model is trained.
64. The computing device of claim 55, wherein the machine learning model is configured to determine a confidence score of the forecasted cash position of the user at the future date.
65. The computing device of claim 55, wherein the trade finance asset digitization and tracking platform further comprises a netting engine, the netting engine configured to detect an expected payment from and an expected payment to a particular party.
66. The computing device of claim 65, wherein the netting engine outputs a notification to the user and the particular party when there is both the expected payment from and the expected payment to the particular party.
67. The computing device of claim 65, wherein, upon detection of the expected payment from and the expected payment to the particular party, the netting engine automatically satisfies one or both of the expected payment from and the expected payment to the particular party.
68. A computer-implemented method for implementing a trade finance asset digitization and tracking platform, comprising:

generating, by a data digitization engine of a computing device having at least one processor, a set of trade finance digital objects corresponding to a set of trade finance documents of a user, each of the set of trade finance documents comprising a record of a financial arrangement between the user and a second party based on a set of terms and conditions, each of the trade finance digital objects comprising an electronic replication of data of its corresponding trade finance document that aligns with a trade finance data object model;

5 aggregating, by a cash forecasting engine of the computing device, the set of trade finance digital objects;

determining, by the cash forecasting engine, a liquidity position for the user based on the electronic replication of data of the trade finance documents; and

10 utilizing, by the cash forecasting engine, a machine learning model to forecast a cash position of the user at a future date, wherein the machine learning model is trained to detect patterns associated with each of the trade finance digital objects based on historical payment activity of its corresponding party.

15 69. The computer-implemented method of claim 68, wherein the forecast of the cash position of the user is further based on accounts payable information.

70. The computer-implemented method of claim 69, wherein the forecast of the cash position of the user is further based on intracompany flow of capital of the user.

20 71. The computer-implemented method of claim 68, wherein the machine learning model is trained to detect a payment delay pattern comprising a time difference between a contracted payment date and an actual payment date from the corresponding party.

72. The computer-implemented method of claim 68, wherein the machine learning model is trained to detect a specific day of week pattern comprising a consistent day of week associated with payments from the corresponding party.

25 73. The computer-implemented method of claim 68, wherein the machine learning model is trained to detect a time period of month pattern comprising a consistent time period of month associated with payments from the corresponding party.

74. The computer-implemented method of claim 73, wherein the consistent time period of month associated with payments from the corresponding party corresponds to a beginning of the month, a middle of the month, or an end of the month.
75. The computer-implemented method of claim 68, wherein the trade finance asset digitization and tracking platform further comprises a validation engine that is used to update the machine learning model.
76. The computer-implemented method of claim 75, wherein the validation engine updates the historical payment activity upon which the machine learning model is trained.
77. The computer-implemented method of claim 68, wherein the machine learning model is configured to determine a confidence score of the forecasted cash position of the user at the future date.
78. The computer-implemented method of claim 68, wherein the trade finance asset digitization and tracking platform further comprises a netting engine, the netting engine configured to detect an expected payment from and an expected payment to a particular party.
79. The computer-implemented method of claim 78, wherein the netting engine outputs a notification to the user and the particular party when there is both the expected payment from and the expected payment to the particular party.
80. The computer-implemented method of claim 78, wherein, upon detection of the expected payment from and the expected payment to the particular party, the netting engine automatically satisfies one or both of the expected payment from and the expected payment to the particular party.