CLAIMS

1. A computing system comprising:

a network interface configured to facilitate communication with devices located remote from the computing system via a communication network;

at least one processor;

a non-transitory computer-readable medium; and

program instructions stored on the non-transitory computer-readable medium that are executable by the at least one processor to cause the computing system to:

receive historical operating data for a plurality of assets;

based on the received historical operating data, define a predictive model related to asset operation; and

transmit the predictive model to at least a first local analytics device associated with a first asset that is located remote from the computing system and thereby configure the first local analytics device to locally execute the predictive model based on operating data received from the first asset.

2. The computing system of claim 1, wherein the historical operating data comprises historical sensor data associated with past occurrences of a given type of failure event at the plurality of assets.

3. The computing system of claim 1, wherein the predictive model is configured to output a probability that a given type of failure event will occur at an asset within a period of time into the future.

4. The computing system of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that are executable by the at least one processor to cause the computing system to:

define a workflow that is configured to run based on the output of the predictive model; and

transmit the workflow to the first local analytics device and thereby configure the first local analytics device to locally execute the workflow in response to determining that the output of the predictive model satisfies threshold criteria.

5. The computing system of claim 4, wherein the workflow comprises one or more of (a) controlling one or more actuators of the first asset to facilitate modifying an operating condition of the first asset, (b) locally executing one or more diagnostic tools at the first asset, (c) acquiring sensor data at the first asset according to a given data-acquisition scheme, or (d) transmitting data related to the first asset to the computing system according to a given data-transmission scheme.

6. The computing system of claim 5, wherein the given data-acquisition scheme indicates one or more sensors of the first asset from which data is acquired.

7. The computing system of claim 6, wherein the given data-acquisition scheme further indicates an amount of data that is to be acquired from each of the one or more sensors.

8. The computing system of claim 5, wherein the given data-transmission scheme indicates a frequency at which the data related to the first asset is transmitted to the computing system.

9. The computing system of claim 4, wherein the computing system is a first computing system, and wherein the workflow comprises transmitting instructions to a second computing system to facilitate causing the second computing system to carry out an operation related to the first asset.

10. The computing system of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that are executable by the at least one processor to cause the computing system to:

transmit the predictive model to a second local analytics device associated with a second asset and thereby configure the second local analytics device to locally execute the predictive model based on operating data received from the second asset.

11. A non-transitory computer-readable medium having instructions stored thereon that are executable to cause a computing system to:

receive historical operating data for a plurality of assets;

based on the received historical operating data, define a predictive model related to asset operation; and

transmit the predictive model to at least a first local analytics device associated with a first asset that is located remote from the computing system and thereby configure the first local analytics device to locally execute the predictive model based on operating data received from the first asset.

12. A computer-implemented method comprising:

receiving historical operating data for a plurality of assets;

based on the received historical operating data, defining a predictive model related to asset operation; and

transmitting the predictive model to at least a first local analytics device associated with a first asset that is located remote from the computing system and thereby configuring the first local analytics device to locally execute the predictive model based on operating data received from the first asset.

13. The computer-implemented method of claim 12, further comprising:

defining a workflow that is configured to run based on the output of the predictive model; and

transmitting the workflow to the first local analytics device and thereby configuring the first local analytics device to locally execute the workflow in response to determining that the output of the predictive model satisfies threshold criteria.

14. A computing system comprising:

at least one processor;

a non-transitory computer-readable medium; and

program instructions stored on the non-transitory computer-readable medium that are executable by the at least one processor to cause the computing system to:

receive operating data for a plurality of assets, wherein the plurality of assets comprises a first asset;

based on the received operating data, define an aggregate predictive model and an aggregate corresponding workflow that are related to the operation of the plurality of assets;

determine one or more characteristics of the first asset;

based on the one or more characteristics of the first asset and the aggregate predictive model and the aggregate corresponding workflow, define at least one of an individualized predictive model or an individualized corresponding workflow that is related to the operation of the first asset; and

transmit to the first asset the defined at least one individualized predictive model or individualized corresponding workflow for local execution by the first asset.

15. The computing system of claim 14, wherein the one or more characteristics of the first asset comprises at least one of an asset age or an asset health.

16. The computing system of claim 14, wherein determining the one or more characteristics of the first asset comprises determining the one or more characteristics of the first asset based on received operating data for the first asset.

17. The computing system of claim 14, wherein defining at least one of an individualized predictive model or an individualized corresponding workflow comprises defining the individualized predictive model and the individualized corresponding workflow, and wherein transmitting the at least one individualized predictive model or individualized corresponding workflow comprises transmitting the individualized predictive model and the individualized corresponding workflow.

18. The computing system of claim 14, wherein defining at least one of an individualized predictive model or an individualized corresponding workflow comprises defining the individualized corresponding workflow, and wherein transmitting the at least one individualized predictive model or individualized corresponding workflow comprises transmitting the aggregate predictive model and the individualized corresponding workflow.

19. The computing system of claim 18, wherein the aggregate corresponding workflow comprises a first operation, and wherein the individualized corresponding workflow comprises a second operation that differs from the first operation.

20. The computing system of claim 19, wherein the first operation comprises acquiring data according to a first acquisition scheme, and wherein the second operation comprises acquiring data according to a second acquisition scheme.

21. The computing system of claim 19, wherein the first operation comprises acquiring data according to an acquisition scheme, and wherein the second operation comprises executing one or more diagnostic tools.

22. The computing system of claim 14, wherein the plurality of assets further comprises a second asset, and wherein the program instructions further comprise instructions that are executable to cause the computing system to:

after transmitting the at least one individualized predictive model or individualized corresponding workflow, receive operating data for the second asset indicating an occurrence of an event at the second asset;

based on the received operating data for the second asset, modify the at least one individualized predictive model or individualized corresponding workflow; and

transmit to the first asset the modified at least one individualized predictive model or individualized corresponding workflow.

23. A non-transitory computer-readable medium having instructions stored thereon that are executable to cause a computing system to:

receive operating data for a plurality of assets, wherein the plurality of assets comprises a first asset;

based on the received operating data, define an aggregate predictive model and an aggregate corresponding workflow that are related to the operation of the plurality of assets;

determine one or more characteristics of the first asset;

based on the one or more characteristics of the first asset and the aggregate predictive model and the aggregate corresponding workflow, define at least one of an individualized predictive model or an individualized corresponding workflow that is related to the operation of the first asset; and

transmit to the first asset the defined at least one individualized predictive model or individualized corresponding workflow for local execution by the first asset.

24. A computer-implemented method comprising:

receiving operating data for a plurality of assets, wherein the plurality of assets comprises a first asset;

based on the received operating data, defining an aggregate predictive model and an aggregate corresponding workflow that are related to the operation of the plurality of assets;

determining one or more characteristics of the first asset;

based on the one or more characteristics of the first asset and the aggregate predictive model and the aggregate corresponding workflow, defining at least one of an individualized predictive model or an individualized corresponding workflow that is related to the operation of the first asset; and

transmitting to the first asset the defined at least one individualized predictive model or individualized corresponding workflow for local execution by the first asset.

25. The computer-implemented method of claim 24, wherein defining at least one of an individualized predictive model or an individualized corresponding workflow comprises defining the individualized corresponding workflow, and wherein transmitting the at least one individualized predictive model or individualized corresponding workflow comprises transmitting the aggregate predictive model and the individualized corresponding workflow.

26. The computer-implemented method of claim 25, wherein the aggregate corresponding workflow comprises a first operation, and wherein the individualized corresponding workflow comprises a second operation that differs from the first operation.

27. The computer-implemented method of claim 26, wherein one of the first operation or the second operation comprises executing one or more diagnostic tools.

28. A local analytics device comprising:

an asset interface configured to communicatively couple the local analytics device to one or more on-board components of an asset;

a network interface configured to facilitate network-based communication between the computing device and a computing system located remote from the computing device;

at least one processor;

a non-transitory computer-readable medium; and

program instructions stored on the non-transitory computer-readable medium that are executable by the at least one processor to cause the local analytics device to:

receive, via the network interface, a predictive model that is related to the operation of the asset, wherein the predictive model is defined by the computing system based on operating data for a plurality of assets;

receive, via the asset interface, operating data for the asset;

execute the predictive model based on at least a portion of the received operating data for the asset; and

based on executing the predictive model, execute a workflow corresponding to the predictive model, wherein executing the workflow comprises causing the asset, via the asset interface, to perform an operation.

29. The local analytics device of claim 28, wherein the asset interface communicatively couples the computing device to an on-asset computer of the asset.

30. The local analytics device of claim 28, wherein the asset comprises an actuator, and wherein executing the workflow comprises causing the actuator to perform a mechanical operation.

31. The local analytics device of claim 28, wherein executing the workflow comprises one or more of (a) causing the asset to execute a diagnostic tool and (b) causing, via the network interface, execution of an operation remote from the asset.

32. The local analytics device of claim 31, wherein causing execution of an operation remote from the asset comprises instructing the computing system to execute an operation remote from the asset.

33. The local analytics device of claim 28, wherein the program instructions stored on the non-transitory computer-readable medium are further executable by the at least one processor to cause the local analytics device to:

before executing the predictive model, individualize the predictive model.

34. The local analytics device of claim 33, wherein individualizing the predictive model comprises modifying one or more parameters of the predictive model based at least on received operating data for the asset.

35. The local analytics device of claim 33, wherein the program instructions stored on the non-transitory computer-readable medium are further executable by the at least one processor to cause the local analytics device to:

after individualizing the predictive model, transmit to the computing system, via the network interface, an indication that the predictive model has been individualized.

36. The local analytics device of claim 28, wherein the predictive model is a first predictive model, and wherein the program instructions stored on the non-transitory computer-readable medium are further executable by the at least one processor to cause the local analytics device to:

before executing the first predictive model, transmit to the computing system, via the network interface, a given subset of the received operating data for the asset, wherein the given subset of received operating data comprises operating data generated by a given group of one or more sensors.

37. The local analytics device of claim 36, wherein the program instructions stored on the non-transitory computer-readable medium are further executable by the at least one processor to cause the local analytics device to:

after transmitting the given subset of the received operating data for the asset, receive a second predictive model that is related to the operation of the asset, wherein the second predictive model is defined by the computing system based on the given subset of the received operating data for the asset; and

execute the second predictive model instead of the first predictive model.

38. A non-transitory computer-readable medium having instructions stored thereon that are executable to cause a local analytics device to:

receive, via a network interface of the local analytics device that is configured to facilitate network-based communication between the local analytics device and a computing system located remote from the computing device, a predictive model that is related to the operation of the asset, wherein the predictive model is defined by the computing system based on operating data for a plurality of assets;

receive, via an asset interface of the local analytics device that communicatively couples the local analytics device to one or more on-board components of an asset, operating data for the asset;

execute the predictive model based on at least a portion of the received operating data for the asset; and

based on executing the predictive model, execute a workflow corresponding to the predictive model, wherein executing the workflow comprises causing the asset, via the asset interface, to perform an operation.

39. The non-transitory computer-readable medium of claim 38, wherein the program instructions stored on the non-transitory computer-readable medium are further executable to cause the local analytics device to:

before executing the predictive model, individualize the predictive model.

40. The non-transitory computer-readable medium of claim 39, wherein individualizing the predictive model comprises modifying one or more parameters of the predictive model based at least on received operating data for the asset.

41. The non-transitory computer-readable medium of claim 38, wherein the predictive model is a first predictive model, and wherein the program instructions stored on the non-transitory computer-readable medium are further executable to cause the local analytics device to:

before executing the first predictive model, transmit to the computing system, via the network interface, a given subset of the received operating data for the asset, wherein the given subset of received operating data comprises operating data generated by a given group of one or more sensors.

42. The non-transitory computer-readable medium of claim 41, wherein the program instructions stored on the non-transitory computer-readable medium are further executable to cause the local analytics device to:

after transmitting the operating data from the particular group of the one or more sensors, receive a second predictive model that is related to the operation of the asset, wherein the second predictive model is defined by the computing system based on the given subset of the received operating data for the asset; and

execute the second predictive model instead of the first model.

43. A computer-implemented method, the method comprising:

receiving, by a local analytics device via a network interface that is configured to facilitate network-based communication between the local analytics device and a computing system located remote from the computing device, a predictive model that is related to the operation of the asset, wherein the predictive model is defined by the computing system based on operating data for a plurality of assets;

receiving, by the local analytics device via a asset interface that communicatively couples the local analytics device to one or more on-board components of an asset, operating data for the asset;

executing, by the local analytics device, the predictive model based on at least a portion of the received operating data for the asset; and

based on executing the predictive model, executing, by the local analytics device, a workflow corresponding to the predictive model, wherein executing the workflow comprises causing the asset, via the asset interface, to perform an operation.

44. The computer-implemented method of claim 43, the method further comprising:

before executing the predictive model, individualizing, by the local analytics device, the predictive model.

45. The computer-implemented method of claim 44, wherein individualizing the predictive model comprises modifying one or more parameters of the predictive model based at least on received operating data for the asset.

46. The computer-implemented method of claim 43, wherein executing the workflow further comprises causing, by the local analytics device via the network interface, execution of an operation remote from the asset.