CLAIMS

1. A method for performing quality control on a diagnostic analyzer, comprising:

receiving, by a central server, a quality control measurement value from each of a plurality of diagnostic analyzers;

receiving, by the central server and from a target diagnostic analyzer, a quality control measurement value;

comparing, by the central server, the quality control measurement value received from the target diagnostic analyzer with statistical criteria associated with the plurality of quality control measurement values received from the plurality of diagnostic analyzers, wherein the statistical criteria define a range having an upper limit and a lower limit associated with the plurality of quality control measurement values;

communicating, by the central server, a comparison result to a user interface associated with the target diagnostic analyzer; and

communicating, by the central server, a troubleshooting instruction to the user interface when the quality control measurement value received from the target diagnostic analyzer is outside of the range,

wherein communication of the troubleshooting instruction to the user interface facilitates determining whether the target diagnostic analyzer is operating correctly.

2. The method of claim 1, wherein

when the quality control measurement value received from the target diagnostic analyzer does not conform to the statistical criteria, communicating an indication, as the comparison result, to the user interface associated with the target diagnostic analyzer that the quality control measurement value received from the target diagnostic analyzer is abnormal.

3. The method according to claim 2, further comprising:

receiving, from the target diagnostic analyzer, a plurality of quality control measurement values;

determining statistical information associated with the plurality of quality control measurement values received from the target diagnostic analyzer, the

statistical information defining a mean and a coefficient of variation associated with the plurality of quality control measurement values received from the target diagnostic analyzer; and

wherein the indication that the quality control measurement value obtained from the target diagnostic analyzer is abnormal is communicated to the user interface when the determined statistical information deviates from the statistical criteria by greater than a pre-determined amount.

4. The method of claim 1, wherein

when the quality control measurement value received from the target diagnostic analyzer conforms to the statistical criteria, communicating an indication, as the comparison result, to the user interface associated with the target diagnostic analyzer that the quality control measurement value received from the target diagnostic analyzer is normal.

5. The method according to claim 1, further comprising

determining a type of abnormality associated with the quality control measurement value received from the target diagnostic analyzer; and

selecting the troubleshooting instruction based on the type of abnormality.

6. The method according to claim 1, wherein when the quality control measurement value received from the target diagnostic analyzer is outside of the range for a predetermined number of consecutive measurements, the method further comprises communicating an indication to the user interface that a service request has been generated.

7. The method according to claim 1, further comprising:

determining a type of abnormality associated with the quality control measurement value received from the target diagnostic analyzer;

selecting a service instruction based on the type of abnormality; and

communicating the service instruction to a technical service center system.

8. The method of claim 1, further comprising:

receiving sample measurement data associated with a plurality of patient samples from the target diagnostic analyzer;

determining at least one mean value associated with at least one quantity of a constituent of the plurality of patient samples based on the received sample measurement data;

comparing the at least one mean value with second statistical criteria associated with a plurality of different patient samples; and

when the at least one mean value does not conform to the second statistical criteria, communicating an indication to the user interface that a quality control measurement is required.

9. The method according to claim 8, further comprising:

receiving sample measurement data associated with the plurality of different patient samples from a plurality of diagnostic analyzers; and

determining the second statistical criteria based on quantities of constituents measured within the plurality of different patient samples.

10. The method of claim 1, wherein the quality control measurement value is measured from a first quality control sample having a first level of constituents, wherein the method further comprises:

receiving, from the target diagnostic analyzer, a second quality control measurement value associated with a second quality control sample having a second level of constituents; and

if both the first quality control measurement value and the second quality control measurement value conform to the statistical criteria, issuing a calibration verification certificate associated with the target diagnostic analyzer.

11. The method according to claim 1, wherein

the quality control measurement value is obtained from each of the plurality of diagnostic analyzers by measuring a quality control sample of a lot, and

the statistical criteria define at least a mean value of the plurality of quality control measurement values received from the plurality of diagnostic analyzers, the method further comprises:

generating a report that relates the mean value with an assay target value associated with the quality control sample of the lot; and

communicating the report to the target diagnostic analyzer in response to a request for the report.

12. The method according to claim 1, further comprising:

adding the quality control measurement value received from the target diagnostic analyzer to the plurality of control measurement values from which the statistical criteria is determined when the quality control measurement value from the target diagnostic analyzer conforms to the statistical criteria; and

excluding the quality control measurement value received from the target diagnostic analyzer from the plurality of control measurement values from which the statistical criteria is determined when the quality control measurement value from the target diagnostic analyzer does not conform to the statistical criteria.

13. The method according to claim 1, wherein the plurality of diagnostic analyzers are installed in geographically distributed facilities.

14. The method according to claim 1, wherein the statistical criteria is updated on a periodic basis, and

the quality control measurement value received from the target diagnostic analyzer is compared with the statistical criteria which has been updated in a latest period.

15. The method of claim 1, wherein the diagnostic analyzer is a blood sample analyzer.

16. A method for performing quality control on a diagnostic analyzer, comprising:

receiving, by a central server, a quality control measurement value from each of a plurality of diagnostic analyzers;

receiving, by the central server and from a target diagnostic analyzer, a quality control measurement value;

comparing, by the central server, the quality control measurement value received from the target diagnostic analyzer with statistical criteria associated with the plurality of quality control measurement values received from the plurality of diagnostic analyzers;

when the quality control measurement value received from the target diagnostic analyzer conforms to the statistical criteria, issuing a calibration verification certificate associated with the target diagnostic analyzer,

generating, by the central server, a user interface image that displays a plurality of quality control result indicators associated with a plurality of quality control measurements performed at different time periods on the target diagnostic analyzer, wherein the quality control result indicator is associated with a quality control measurement value which conforms to the statistical criteria;

communicating the user interface image to the target diagnostic analyzer; and

in response to a selection of one of the quality control result indicators, communicating to the target diagnostic analyzer, a calibration verification report associated with the selected quality control result indicator.

17. The method of claim 16, wherein

the user interface image further displays a plurality of quality control result indicators associated with one of a plurality of quality control operations performed at different time periods on the target diagnostic analyzer, wherein the quality control result indicator indicates whether an associated quality control operation resulted in success or failure.

18. The method of claim 17, wherein in response to the selection of one of the quality control result indicators, the method further comprises:

receiving user identifying information associated with a user that submitted the request for the status report; and

logging the request and associated user identifying information to a database to thereby obtain a review history associated with the user.

19. The method of claim 16, wherein

the quality control measurement value received from each of the plurality of diagnostic analyzers includes a first quality control measurement value associated with a first level of quality control sample and a second control measurement value associated with a second level of quality control material;

the statistical criteria is associated with the received plurality of first quality control measurement values and the received plurality of second quality control measurement values;

the first and the second quality control measurement values received from the target diagnostic analyzer are compared with the statistical criteria; and

when the first and second quality control measurement values received from the target diagnostic analyzer conform to the statistical criteria, the calibration verification certificate is issued.

20. The method of claim 16, wherein the diagnostic analyzer is an automated cell counter.

21. The method of claim 16, wherein each quality control indicator is represented by one of a plurality of symbols that facilitates identifying an indicator type, wherein one or more of the symbols indicates: that two levels of QC samples were measured, that the target diagnostic analyzer was being serviced, that the target diagnostic analyzer failed a QC measurement, or that a background count pass.

22. A method for performing quality control on a diagnostic analyzer comprising:

receiving, by a central server, sample measurement data associated with a plurality of patient samples from a target diagnostic analyzer;

determining, by the central server, at least one mean value associated with at least one quantity of a constituent of the plurality of patient samples based on the sample measurement data received from the target diagnostic analyzer;

comparing, by the central server, the at least one mean value with statistical criteria associated with a plurality of different patient samples; and

when the at least one mean value does not conform to the statistical criteria, communicating, by the central server, an indication to a user interface associated with the target diagnostic analyzer that a quality control measurement is required,

wherein requiring the quality control measurement facilitates determining whether the target diagnostic analyzer is operating correctly.

23. The method of claim 22, wherein the target diagnostic analyzer is any one of a plurality of diagnostic analyzers which are installed in geographically distributed facilities, wherein the method further comprises:

receiving, from each of the plurality of diagnostic analyzers, sample measurement data every time a patient sample is measured;

for each patient sample, determining at least one mean value associated with at least one quantity of a constituent of the patient samples; and

when the at least one mean value does not conform to the statistical criteria, communicating the indication to the diagnostic analyzer associated with the patient sample for which the mean value does not conform to the statistical criteria.

24. The method of claim 22, further comprising:

preventing sample measurement data from which the at least one mean value has been determined from being reported to outside the target diagnostic analyzer when the at least one mean value does not conform to the statistical criteria.

25. A system for performing quality control comprising:

a target diagnostic analyzer configured to generate a quality control measurement value associated with a quality control sample;

a plurality of peer group diagnostic analyzers that are peers of the target diagnostic analyzer configured to generate quality control measurement values associated with quality control samples measured in the peer group diagnostic analyzers;

a central server in communication with the target diagnostic analyzer and the plurality of peer group diagnostic analyzers, and configured to:

receive the quality control measurement values from both the target diagnostic analyzer and the plurality of peer group diagnostic analyzers;

compare the quality control measurement value received from the target diagnostic analyzer with statistical criteria associated with the plurality of quality control measurement values received from the plurality of peer group diagnostic analyzers, wherein the statistical criteria define a range having an upper limit and a lower limit associated with the plurality of quality control measurement values;

communicate a comparison result to a user interface associated with the target diagnostic analyzer; and

communicate a troubleshooting instruction to the user interface when the quality control measurement value received from the target diagnostic analyzer is outside of the range,

wherein communication of the troubleshooting instruction to the user interface facilitates determining whether the target diagnostic analyzer is operating correctly.

26. The system according to claim 25, wherein

when the quality control measurement value received from the target diagnostic analyzer does not conform to the statistical criteria, communicate an indication, as the comparison result, to the user interface associated with the target diagnostic analyzer that the quality control measurement value obtained from the target diagnostic analyzer is abnormal.

27. A server for performing quality control comprising:

a processor in communication with a target diagnostic analyzer and a plurality of peer group diagnostic analyzers; and

non-transitory computer readable media in communication with the processor, wherein the non-transitory computer readable media includes instructions code that when executed by the processor causes the processor to:

receive quality control measurement values from both the target diagnostic analyzer and the plurality of peer group diagnostic analyzers;

compare the quality control measurement value received from the target diagnostic analyzer with statistical criteria associated with the plurality of quality control measurement values received from the plurality of peer group diagnostic analyzers, wherein the statistical criteria define a range having an upper limit and a lower limit associated with the plurality of quality control measurement values; and

communicate a comparison result to a user interface associated with the target diagnostic analyzer,

wherein comparison of the quality control measurement values received from the target diagnostic analyzer with statistical criteria associated with the plurality of quality control measurement values received from the plurality of peer group diagnostic analyzers facilitates determining whether the target diagnostic analyzer is operating correctly.

28. The server according to claim 27, wherein

when the quality control measurement value received from the target diagnostic analyzer does not conform to the statistical criteria, communicate an indication, as the comparison result, to the user interface associated with the target diagnostic analyzer that the quality control measurement value obtained from the target diagnostic analyzer is abnormal.

29. A diagnostic analyzer comprising:

measurement hardware configured to measure constituent quantities of a quality control sample;

a user interface configured to indicate an operational status of the diagnostic analyzer;

a communication interface configured to facilitate data transfer between the diagnostic analyzer and a central server; and

a processor in communication with the measurement hardware, the user interface, and the communication interface, wherein the processor is configured to:

control the measurement hardware to measure a quantity of at least one constituent of the quality control sample;

communicate, via the communication interface, the measurement value to the central server;

receive, from the central server, an indication as to whether there is an issue with the measurement value, wherein an issue with the measurement value is determined by the central server when the measurement value is outside of a upper and lower limit range of a statistical criteria associated with measurement value;

update the user interface to indicate that there is an issue with the measurement value;

receive one or more instructions from the central server for troubleshooting the issue with the measurement value; and

display, via the user interface, the one or more instructions,

wherein displaying the one or more instructions facilitates determining whether the target diagnostic analyzer is operating correctly.

30. The diagnostic analyzer according to claim 29, for each of the one or more instructions, the processor is further configured to:

receive, via the user interface, a confirmation the instruction has been performed; and

communicate and indication to the central server that the instruction has been performed prior to receiving a subsequent instruction.

31. The diagnostic analyzer according to claim 30, wherein when receiving the confirmation that the instruction has been performed, the processor is configured to:

receive, via the user interface, operator information that identifies the operator; and

communicate the operator information to the central server.

32. A diagnostic analyzer comprising:

measurement hardware configured to measure constituent quantities of a quality control sample;

a user interface;

a communication interface configured to facilitate data transfer between the diagnostic analyzer and a central server; and

a processor in communication with the measurement hardware, the user interface, and the communication interface, wherein the processor is configured to:

receive, from the central server, statistical criteria associated with a plurality of quality control measurement values received from a plurality of diagnostic analyzers;

control the measurement hardware to measure a quantity of at least one constituent of the quality control sample;

compare the measurement value with the statistical criteria, wherein the statistical criteria define a range having an upper limit and a lower limit associated with the plurality of quality control measurement values;

display a comparison result via the user interface; and

display a troubleshooting instruction received from a central server on the user interface when the quality control measurement value received from the target diagnostic analyzer is outside of the range,

wherein display of the troubleshooting instruction to the user interface facilitates determining whether the target diagnostic analyzer is operating correctly.

33. A method of operating a diagnostic analyzer comprising:

controlling measurement hardware to measure a quantity of at least one constituent of a quality control sample;

communicating, via a communication interface, a measurement value associated with the measured quantity to a central server;

receiving, from the central server, an indication as to whether there is an issue with the measurement value, wherein an issue with the measurement value is determined by the central server when the measurement value is outside of a upper and lower limit range of a statistical criteria associated with measurement value;

updating the user interface to indicate that there is an issue with the measurement value;

receiving one or more instructions from the central server for troubleshooting the issue with the measurement value; and

displaying, via a user interface, the one or more instructions,

wherein communication of the one or more instructions to the user interface facilitates determining whether the target diagnostic analyzer is operating correctly.