

What is Claimed is:

1. A blockchain data recording method comprising:
 - determining a recording type as one of an on-chain type and an off-chain type according to a target data to be recorded in a blockchain,
 - transmitting a first transaction proposal to record the target data in a blockchain node configured to store on-chain data on the blockchain to the blockchain node when the recording type is the on-chain type; and
 - recording the target data in a storage node configured to store an off-chain data, and transmitting a second transaction proposal for storing recording information of the target data in the blockchain to the blockchain node when the recording type is the off-chain type,
 - wherein the determining comprises determining the recording type as the on-chain type when a size of the target data is less than a threshold and determining the recording type as the off-chain type when the size of the target data is greater than or equal to the threshold which is a value that is dynamically adjusted according to a congestion level of the blockchain.
2. The blockchain data recording method of claim 1, wherein the determining further comprises:
 - determining the recording type as the on-chain type when the size of the target data is less than a first threshold;
 - determining the recording type as the off-chain type when the size of the target data is greater than or equal to a second threshold which is a value greater than the first threshold; and
 - determining the recording type as one of the on-chain type and the off-chain type according to the congestion level of the blockchain when the size of the target data is greater than or equal to the first threshold and less than the second threshold.
3. The blockchain data recording method of claim 1, wherein the determining further comprises:
 - determining the recording type as the on-chain type when the size of the target data is less than a first threshold;

determining the recording type as the off-chain type when the size of the target data is greater than or equal to a second threshold which is a value greater than the first threshold; and

determining the recording type as one of the on-chain type and the off-chain type according to at least one of items of metadata of the target data when the size of the target data is greater than or equal to the first threshold and less than the second threshold, the at least one of items being other than the size of the target data.

4. The blockchain data recording method of claim 1, wherein the determining further comprises:

determining the recording type as the off-chain type when the target data is in a plain text format; and

determining the recording type as the on-chain type when the target data is of a format other than the plain text format.

5. The blockchain data recording method of claim 1, wherein the determining further comprises:

determining the recording type as the off-chain type when the target data includes a secure data; and

determining the recording type as the on-chain type when the target data is absent of the secure data.

6. The blockchain data recording method of claim 1, wherein the recording of the target data in the storage node comprises determining a storage type selected from a file system type and a database type to store the target data according to the target data.

7. The blockchain data recording method of claim 6, wherein the determining of the storage type to store the target data comprises:

determining the storage type as the file system type when the size of the target data is greater than or equal to a third threshold; and

determining the storage type as the database type when the size of the target data is less than the third threshold.

8. The blockchain data recording method of claim 6, wherein the determining of the storage type to store the target data comprises:

determining the storage type as the database type when the target data is in a structured data format; and

determining the storage type as the file system when the target data is other than the structured data format.

9. A blockchain data recording device comprising:

a network interface connected to a blockchain node configured to store on-chain data on a blockchain and a storage node configured to store an off-chain data;

a memory;

a blockchain transaction processor comprising a classifier to determine a recording type as one of an on-chain type and an off-chain type according to a target data to be recorded in the blockchain;

an off-chain handler to transmit and receive an off-chain data to and from a storage node so that the target data is recorded in the storage node provided to store the off-chain data when the recording type is the off-chain type;

an on-chain handler to transmit a first transaction proposal to record the target data in a blockchain node configured to store on-chain data on the blockchain to the blockchain node through the network interface when the recording type is the on-chain type, and to transmit a second transaction proposal to store recording information of the target data in the blockchain to the blockchain node through the network interface when the recording type is the off-chain type; and

a processor to execute instructions implementing the blockchain transaction processor, the on-chain handler and the off-chain handler,

wherein the classifier is configured to:

determine the recording type as the on-chain type when a size of the target data is less than a threshold; and

determine the recording type as the off-chain type when the size of the target data is greater than or equal to the threshold, the threshold being a value that is dynamically adjusted based on a congestion level of the blockchain.

10. The blockchain data recording device of claim 9, wherein the blockchain transaction processor further comprises an analyzer to monitor the blockchain and

automatically adjust a setting value of the classifier according to the monitoring result;
and

the classifier to determine the recording type by using the automatically adjusted setting value.

11. The blockchain data recording device of claim 9, wherein the blockchain transaction processor further comprises:

a storage classifier to determine a storage type to store the target data by using at least one of a size of the target data and whether the target data is in a structured data format; and

the off-chain handler to transmit and receive the off-chain data to and from the storage node of the determined storage type.

12. The blockchain data recording device of claim 9, wherein the classifier is configured to:

determine the recording type as the on-chain type when the size of the target data is less than a first threshold;

determine the recording type as the off-chain type when the size of the target data is greater than or equal to a second threshold; and

determine the recording type as one of the on-chain type and the off-chain type according to the congestion level of the blockchain when the size of target data is greater than or equal to the first threshold and less than the second threshold, the second threshold being a value greater than the first threshold.

13. The blockchain data recording device of claim 9, wherein the classifier is configured to:

determine the recording type as the on-chain type when the size of the target data is less than a first threshold;

determine the recording type as the off-chain type when the size of the target data is greater than or equal to a second threshold; and

determine the recording type as one of the on-chain type and the off-chain type according to at least one of items of metadata of the target data when the size of the target data is greater than or equal to the first threshold and less than the second threshold,

wherein the second threshold is greater than the first threshold; and the at least one of items is other than the size of the target data.

14. The blockchain data recording device of claim 9, wherein the classifier is configured to:

determine the recording type as the off-chain type when the target data is in plain text format; and

determine the recording type as the on-chain type when the target data is other than in plain text format.

15. The blockchain data recording device of claim 9, wherein the classifier is configured to:

determine the recording type as the off-chain type when the target data includes a secure data; and

determine the recording type as the on-chain type when the target data is absent of a secure data.