What is Claimed is:

1. A blockchain based data management method performed by a computing device comprising:

recording a deletion event for off-chain data and time information of the deletion event in a blockchain network; and

selectively deleting the off-chain data based on a validity verification result calculated for the time information,

wherein the validity verification result is calculated using a time-consensus algorithm of the blockchain network,

wherein the verification value indicates that the time information is valid only when the time information is located within a preset time window, and

wherein the time window is a time period set to prevent an edge effect.

2. The blockchain based data management method of claim 1,

wherein recording the time information in the blockchain network comprises,

checking a validity period of the off-chain data; and

comparing the validity period with the time information, and recording the deletion event and the time information in the blockchain network if it is determined that the validity period has expired.

3. The blockchain based data management method of claim 1,

wherein the time-consensus algorithm,

is an algorithm that verifies validity of the time information on on-chain through consensus between a plurality of blockchain nodes in the blockchain network, and

verifies validity of the time information based on verification values determined based on reference time information of each of the blockchain nodes.

4. The blockchain based data management method of claim 1,

wherein the time-consensus algorithm,

is an algorithm that verifies validity of the time information on on-chain through consensus between a plurality of blockchain nodes in the blockchain network,

verifies validity of the time information based on verification values determined based on reference time information of transactions generated by each of the plurality of blockchain nodes in response to the deletion event.

5. The blockchain based data management method of claim 3,

wherein each of the verification values indicates whether the time information is valid according to whether the time information is located within a predetermined time range based on each of the reference time information.

6. The blockchain based data management method of claim 1,

wherein on-chain data related to the off-chain data is updated to indicate that the off-chain data has been deleted when it is determined that the time information is valid by the time-consensus algorithm,

wherein selectively deleting the off-chain data comprises,

deleting the off-chain data based on the updated on-chain data.

7. The blockchain based data management method of claim 1,

wherein selectively deleting the off-chain data comprises,

deleting the off-chain data from an off-chain storage based on a block event indicating a validity verification result of the time information.

8. The blockchain based data management method of claim 7,

wherein selectively deleting the off-chain data further comprises,

generating an additional block event indicating that the off-chain data has been deleted.

wherein on-chain data related to the off-chain data is updated to indicate that the off-chain data has been deleted, according to generation of the additional block event.

9. The blockchain based data management method of claim 7,

wherein the first blockchain node is a node that receives and stores the off-chain data in a first off-chain storage,

wherein the first blockchain node deletes the off-chain data from the first off-chain storage based on the block event.

10. A blockchain based data management method performed by a computing device comprising:

requesting a first blockchain node to delete off-chain data stored in a first off-chain storage;

detecting, via a blockchain network, a deletion result reported by the first blockchain node;

requesting the first blockchain node to submit storage space information corresponding to the first off-chain storage after deletion of the off-chain data; and

verifying, by chain code of the blockchain network and independently of the first blockchain node, validity of the storage space information by cryptographically accessing the first off-chain storage using one-time authentication information recorded on-chain,

wherein the deletion of the off-chain data is confirmed only when the chain code verifies absence of the off-chain data from the first off-chain storage.

11. The blockchain based data management method of claim 10, further comprises,

checking the storage space information through the blockchain network to provide a first encryption key to the blockchain network,

wherein the storage space information is encrypted with a second encryption key corresponding to the first encryption key and recorded in the blockchain network,

wherein the chain code performs an operation of querying the first off-chain storage using the first encryption key to verify validity of the storage space information.

12. The blockchain based data management method of claim 11,

wherein the storage space information comprises a first hash value for storage space of the first off-chain storage,

wherein the chain code queries the first off-chain storage to obtain a second hash value for the storage space, and compares the second hash value with the first hash value to verify validity of the storage space information.

13. The blockchain based data management method of claim 11,

wherein the chain code checks authenticity of the first off-chain storage by using a data ID (Identification) extracted from on-chain data related to the first off-chain storage.

14. A blockchain based data management apparatus comprising:

a processor;

a memory for loading a computer program executed by the processor; and

a storage for storing the computer program,

wherein the computer program comprises instructions for executing operations to,

record, in a blockchain network, a deletion or discard event for off-chain data together with associated time information;

execute, via chain code of the blockchain network, a time-consensus algorithm aggregating time-validity determinations from a plurality of blockchain nodes; and

delete the off-chain data only when the time-consensus algorithm confirms validity of the time information,

thereby preventing deletion based on time information supplied by a single blockchain node.