

What is claimed is:

1. A computer system for managing a construction project with an immutable record of construction documents and executing each of the construction documents using live data and tracking codes, the system comprising:
 - an attribute extraction module configured to extract one or more pertinent information about the construction document to obtain attributes of the construction document;
 - a blockchain network comprising a plurality of nodes for managing a blockchain comprising a plurality of blocks, each node comprising one or more processors and storing at least a portion of the blockchain;
 - a tracking code generator for generating the tracking code for each block in the blockchain, wherein each tracking code is associated to a particular construction document and can be used to directly access the block storing said particular construction document; and
 - a data repository, being isolated from the blockchain network, configured to perform real-time management of the live data and the tracking codes for the construction documents in the blockchain;wherein:
 - when the construction document is received by the system, the construction document is stored in a block added to the blockchain network;
 - the live data is a changeable record comprising the attributes, thereby the data repository manages the changeable record of the live data and the tracking code for each of the construction documents and provides direct access of the blocks in the blockchain; and
 - the construction documents are decentralized in the blockchain network to maintain an immutable and non-corruptible copy of the construction documents.
2. The system of claim 1 further comprising a document compiler configured to impart the tracking code to the construction document for obtaining a stamped document, such that the block storing the construction document is accessible by a user in a procession of a printed copy of the stamped document.

3. The system of claim 1, wherein the data repository comprises an authentication unit for performing a user authentication for the access of the data repository, wherein:
 - the authentication unit generates an authentication key for a first record in the data repository comprising the tracking code and the live data of the construction document; and
 - the authentication key is used by a data requester to access the first record in the data repository for obtaining the tracking code, thereby the data requester can directly access the block storing the construction document.
4. The system of claim 3, wherein:
 - the first record in the data repository is updated to link to a second record when a revised version of the construction document is received with a second tracking code and a second live data for the revised version stored in the second record in the data repository; and
 - the authentication key is used by the data requester to access the first record and the second record in the data repository for obtaining the second tracking code, thereby the data requester can directly access the block storing the revised version of the construction document.
5. The system of claim 1, wherein the attribute extraction module receives a digital certificate of the construction document from an independent third party, such that the attributes obtainable from the attribute extraction module comprise a digital key for certifying that the construction document is a true copy.
6. The system of claim 1, wherein the attribute extraction module comprises:
 - a file attributes extracting unit; and
 - a data recognition unit.
7. The system of claim 6, wherein the file attributes extracting unit is configured to extract electronic data related to the pertinent information about the construction document to obtain at least a part of the attributes.
8. The system of claim 6, wherein the data recognition unit is configured to, when the construction document is a construction drawing, locate a title block by identifying an

orientation and outlines of the title block, and perform word recognition of words inside the title block.

9. The system of claim 6, wherein the data recognition unit is configured to take reference to a database of commonly used terms with terms including the attributes and a dictionary of standard construction terms.
10. The system of claim 1, wherein the block comprises a timestamp, a hash value, and a storage data for storing the construction document.
11. The system of claim 10, wherein the hash value is a Merkle root concatenating hashes of preceding blocks in the blockchain.
12. A common data environment (CDE) system for managing a construction project accessible by a plurality of parties with an immutable record of building information modeling (BIM) data and executing each of the BIM data using live data and tracking codes, the system comprising:
 - an attribute extraction module configured to extract one or more pertinent information about the BIM data to obtain attributes of the BIM data;
 - a blockchain network comprising a plurality of nodes for managing a blockchain comprising a plurality of blocks, each node comprising one or more processors and storing at least a portion of the blockchain;
 - a tracking code generator for generating the tracking code for each block in the blockchain, wherein each tracking code is associated to a particular BIM data and can be used to directly access the block storing said particular BIM data;
 - and
 - a data repository, being isolated from the blockchain network, configured to perform real-time management of the live data and the tracking codes for the BIM data in the blockchain;wherein:
 - when the BIM data is received by the system, the BIM data is stored in a block added to the blockchain network;
 - the live data is a changeable record comprising the attributes, thereby the data repository manages the changeable record of the live data and the tracking code

for each of the BIM data and provides direct access of the blocks in the blockchain; and

the BIM data are decentralized in the blockchain network to maintain an immutable and non-corruptible copy of the BIM data.

13. The system of claim 12 further comprising a document compiler configured to impart the tracking code to the BIM data for obtaining a stamped document, such that the block storing the BIM data is accessible by a user in a procession of a printed copy of the stamped document.
14. The system of claim 12, wherein the attribute extraction module receives a digital certificate of the BIM data from an independent third party, such that the attributes obtainable from the attribute extraction module comprise a digital key for certifying that the BIM data is a true copy.
15. The system of claim 12, wherein the attribute extraction module comprises:
 - a file attributes extracting unit; and
 - a data recognition unit.
16. The system of claim 15, wherein the file attributes extracting unit is configured to extract electronic data related to the pertinent information about the BIM data to obtain at least a part of the attributes.
17. The system of claim 15, wherein the data recognition unit is configured to locate a title block in the BIM data by identifying an orientation and outlines of the title block, and perform word recognition of words inside the title block.
18. The system of claim 15, wherein the data recognition unit is configured to take reference to a database of commonly used terms with terms including the attributes and a dictionary of standard construction terms.
19. A computer system for managing a construction project with an immutable record of construction documents and executing each of the construction documents using live data and tracking codes, the system comprising:

a gateway device configured to receive the construction document and metadata of the construction document from a document originator;

an attribute extraction module configured to extract one or more pertinent information about the construction document to obtain attributes of the construction document;

a blockchain network comprising a plurality of nodes for managing a blockchain comprising a plurality of blocks, each node comprising one or more processors and storing at least a portion of the blockchain;

a tracking code generator for generating the tracking code for each block in the blockchain, wherein each tracking code is associated to a particular construction document and can be used to directly access the block storing said particular construction document; and

a data repository, being isolated from the blockchain network, configured to perform real-time management of the live data and the tracking codes for the construction documents in the blockchain;

wherein:

the gateway device generates the plurality of blocks and adds the blocks to the blockchain network;

the live data is a changeable record comprising the metadata and the attributes, thereby the data repository manages the changeable record of the live data and the tracking code for each of the construction documents and provides direct access of the blocks in the blockchain; and

the construction documents are decentralized in the blockchain network to maintain an immutable and non-corruptible copy of the construction documents.

20. A method for managing a construction project with an immutable record of construction documents using a blockchain network and a data repository, the method comprising the steps of:

extracting one or more pertinent information, by an attribute extraction module, from the construction document to obtain attributes of the construction document;

generating live data, wherein the live data is a changeable record comprising the attributes;

updating the blockchain network by storing the construction document in a block and adding the block to the blockchain network;

generating a tracking code, by a tracking code generator, for each block in the blockchain, wherein each tracking code is associated to a particular construction document and can be used to directly access the block storing said particular construction document; and

updating the data repository to store the live data and the tracking code, wherein the data repository is isolated from the blockchain network and is configured to perform real-time management of the live data and the tracking codes for the construction documents in the blockchain.

21. The method of claim 20 further comprising the step of imparting the tracking code to the construction document for obtaining a stamped document, such that the block storing the construction document is accessible by a user in a procession of a printed copy of the stamped document.
22. The method of claim 20 further comprising the steps of:
- generating an authentication key, by an authentication unit, for a first record in the data repository comprising the tracking code and the live data of the construction document; and
- applying the authentication key, by a data requester, for accessing the first record in the data repository for obtaining the tracking code, thereby the data requester can directly access the block storing the construction document.
23. The method of claim 20 further comprising the step of receiving a digital certificate of the construction document from an independent third party, such that the attributes obtainable from the attribute extraction module comprise a digital key for certifying that the construction document is a true copy.
24. The method of claim 20, wherein the updating the blockchain network comprises storing a hash value of a preceding blocks to the block.