

CLAIMS

~~1.~~ 1. A computer-implemented method ~~comprising:~~
~~at for managing a~~ blockchain-based customer clearance service platform, ~~receiving comprising:~~
receiving, using an API by the service platform managing interactions between one or more users and a consortium blockchain, a first request to authorize a first member to access information related to a first order, wherein the information is provided to a service authority for requesting clearance for the first order, and the first request is sent from an administrator;

invoking a smart contract executing on the consortium blockchain to request that the first member be added to a list of authorized members who are authorized to access the information related to the first order, in which the smart contract is configured to maintain a mutable data structure on a blockchain node that stores information about the authorized members, wherein the consortium blockchain stores the information related to the first order or a processed version of the information related to the first order and the mutable data structure is a cache storage linked with an immutable data structure based on index data;

receiving a confirmation from the smart contract that the first member has been added to the list of authorized members in the mutable data structure on the blockchain node; and

sending a confirmation to the administrator that the first member has been added to the list of authorized members in the mutable data structure on the blockchain node.

2. The method of claim 1, comprising-:

~~2.~~ at the service platform, receiving a third request from the first member to record or update information related to the first order-;

determining whether the first member is one of the authorized members who are authorized to access information related to the first order; and

upon confirming that the first member is an authorized member, record or update the information related to the first order according to the third request.

~~3.~~ 3. The method of claim 2, wherein determining whether the first member is one of the authorized members comprises invoking the smart contract executing on the consortium blockchain to determine whether the first member is one of the authorized members based on the information stored in the mutable data structure.

4. The method of ~~any of claims~~ claim 1 to 3, comprising-:

~~4.~~ at the service platform, receiving a third request from a second member to record or update information related to the first order;~~;~~

determining whether the second member is one of the authorized members who are authorized to access information related to the first order; and

upon confirming that the second member is not an authorized member, denying the third request from the second member.

~~5.~~ 5. The method of any of ~~claimsclaim~~ 1 ~~to 4~~, comprising providing ~~another first~~ application programming interface (API) to enable an administrator to add a new member to a list of authorized members who are authorized to access information related to an order.

~~6.~~ 6. The method of ~~any of claimsclaim~~ 1 ~~to 5~~, comprising providing ~~another~~ application programming interface (API) to enable an administrator to remove a member from a list of authorized members who are authorized to access information related to an order.

~~7.~~ 7. The method of ~~any of claimsclaim~~ 1 ~~to 6~~, comprising providing ~~another~~ application programming interface (API) to enable an administrator to set a permission level for a member who is authorized to access information related to an order, and storing information about the permission level in a second data structure that stores information about a list of members who are authorized to access the information related to the order.

~~8.~~ 8. The method of ~~any of claimsclaim~~ 1 ~~to 7~~, comprising providing an application programming interface (API) to enable an administrator to update information for a member who is authorized to access information related to an order, and storing the updated information for the member in a second data structure that stores information about a list of members who are authorized to access the information related to the order.

~~9.~~ 9. The method of ~~any of claimsclaim~~ 1 ~~to 8~~, wherein the information comprises at least one of order data, logistics data, or payment data associated with the first order.

~~10.~~ 10. The method of claim 1, wherein the information is import custom clearance information and the first order is a first import order.

11. The method of claim 1, wherein the mutable data structure and the smart contract are executed and maintained in a Trusted Executing Environment (TEE).

~~11.—12.~~ A computer-implemented method ~~comprising:~~
~~at a for managing a blockchain-based customer clearance service platform, receiving~~
~~comprising:~~

receiving, using an API by the service platform managing interactions between one or more users and a consortium blockchain, a first request from a first user to record or update information related to a first order, wherein the information is provided, or to be provided, to a service authority for requesting clearance for merchandize included in the first order;

determining whether the first user is one of authorized members who are authorized to record or update the information related to the first order, by invoking a smart contract executing on the consortium blockchain based on information stored in a mutable data structure on a blockchain node, the mutable data structure maintained by the smart contract on a blockchain node that stores information about the authorized members, wherein the mutable data structure is a cache storage linked with an immutable data structure based on index data;
 and

upon confirming that the first user is an authorized member, recording or updating the information related to the first order according to the first request and sending a confirmation to an administrator that the updated information related to the first order has been added to the mutable data structure on the blockchain node.

~~12.—The method of claim 11, wherein determining whether the first member is one of the authorized members comprises invoking a smart contract executing on a blockchain to determine whether the first user is one of the authorized members based on information stored in a data structure maintained by the smart contract.~~

~~The method of claim 11 or 12, comprising~~ 13. The method of claim 12, comprising:

~~13.~~ at the service platform, receiving a second request from the first user to record or update information related to a second order, wherein the information is provided, or to be provided, to the service authority for requesting clearance for ~~merchandize~~merchandise included in the second order,

determining whether the first user is one of authorized members who are authorized to access the information related to the second order; and

upon determining that the first user is not authorized to access the information related to the second order, denying the second request from the first user.

~~14.~~ 14. The method of claim ~~11~~12, wherein the information is import custom clearance information, the first order is a first import order, and the service authority is a customs authority for custom clearance of the ~~merchandize~~merchandise included in the first order.

15. —A system for ~~user management~~managing a blockchain-based customer clearance service platform, comprising:

——one or more ~~processors~~computers; and

——~~one or more~~a non-transitory computer-~~readable~~ ~~memories coupled to the one or more processors and having~~medium storing instructions ~~stored thereon~~ that are executable by the one or more ~~processors~~computers and that upon execution cause the one or more computers to perform operations as a service platform, the ~~method of any of claims 1 to 14~~operations

~~16.~~ —An apparatus for user management, the apparatus comprising ~~a plurality of modules for performing the method of any of claims 1 to 14~~;

receiving, using an API by the service platform managing interactions between one or more users and a consortium blockchain, a first request to authorize a first member to access information related to a first order, wherein the information is provided to a service authority for requesting clearance for the first order, and the first request is sent from an administrator;

invoking a smart contract executing on the consortium blockchain to request that the first member be added to a list of authorized members who are authorized to access the information related to the first order, in which the smart contract is configured to maintain a mutable data structure on a blockchain node that stores information about the authorized members, wherein the consortium blockchain stores the information related to the first order or a processed version of the information related to the first order and the mutable data structure is a cache storage linked with an immutable data structure based on index data;

receiving a confirmation from the smart contract that the first member has been added to the list of authorized members in the mutable data structure on the blockchain node; and

sending a confirmation to the administrator that the first member has been added to the list of authorized members in the mutable data structure on the blockchain node.

16. The system of claim 15, the operations comprising:

at the service platform, receiving a third request from the first member to record or update information related to the first order;

determining whether the first member is one of the authorized members who are authorized to access information related to the first order; and

upon confirming that the first member is an authorized member, record or update the information related to the first order according to the third request.

17. The system of claim 16, wherein determining whether the first member is one of the authorized members comprises invoking the smart contract executing on the consortium blockchain to determine whether the first member is one of the authorized members based on the information stored in the mutable data structure.

18. The system of claim 15, comprising:

at the service platform, receiving a third request from a second member to record or update information related to the first order;

determining whether the second member is one of the authorized members who are authorized to access information related to the first order; and

upon confirming that the second member is not an authorized member, denying the third request from the second member.

19. The system of claim 15, the operations comprising providing another application programming interface (API) to enable an administrator to update information for a member who is authorized to access information related to an order, and storing the updated information for the member in a second data structure that stores information about a list of members who are authorized to access the information related to the order.

20. A non-transitory computer-readable medium storing instructions that are executable by the one or more computers and that upon execution cause the one or more computers to manage operations for a blockchain-based customer clearance service platform, the operations comprising:

receiving, using an API by the service platform managing interactions between one or more users and a consortium blockchain, a first request to authorize a first member to access information related to a first order, wherein the information is provided to a service authority for requesting clearance for the first order, and the first request is sent from an administrator;

invoking a smart contract executing on the consortium blockchain to request that the first member be added to a list of authorized members who are authorized to access the information related to the first order, in which the smart contract is configured to maintain a mutable data structure that stores information about the authorized members, wherein the consortium blockchain stores the information related to the first order or a processed version of the information related to the first order and the mutable data structure is a cache storage linked with an immutable data structure based on an index data;

receiving a confirmation from the smart contract that the first member has been added to the list of authorized members; and

sending a confirmation to the administrator that the first member has been added to the list of authorized members.