

CLAIMS

What is claimed is:

1. A computer-implemented method, ~~the method~~ comprising:

~~receiving, at executing, by~~ a map-service provider ~~associated with a~~, a first smart contract on a blockchain, map data from a with a data collector, wherein the map-service provider and the data collector are computing devices participating in the blockchain;

receiving, at the map-service provider, map data from the data collector;
executing, by the map-service provider, a second smart contract on the blockchain
with a data-service provider, wherein the data-service provider is a computing device
participating in the blockchain;

~~transmitting, by the map-service provider,~~ the map data to ~~at~~ the data-service provider for processing;

executing, by the map-service provider, a third smart contract on the blockchain
with a data provider, wherein the data provider is a computing device participating in the
blockchain;

receiving, at the map-service provider, non-crowdsourced data from ~~at~~ the data provider;

~~transmitting, by the map-service provider,~~ the non-crowdsourced data to the data-service provider for processing with the map data;

receiving, ~~by the map-service provider,~~ a request for processed map data from a service user;

retrieving, ~~by the map-service provider~~ from the data-service provider, the processed map data that is generated from the map data and the non-crowdsourced data;
~~and~~

~~transmitting~~ executing, by the map-service provider, a fourth smart contract on the blockchain with the service user; and

transmitting the processed map data to the service user in response to the request.

2. The computer-implemented method of claim 1, wherein the map-service provider provides automated data consumption or data authorization for the service user.

3. ~~—The computer-implemented method of claim 1, wherein the map-service provider, the data-service provider, and the data provider are computing devices participating in the blockchain.~~

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4. ~~—The computer-implemented method of claim 1, further comprising: prior to receiving the map data from the data collector, executing, by the map-service provider, a smart contract with the data collector.~~

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5. ~~—The computer-implemented method of claim 1, further comprising: prior to transmitting the map data to the data-service provider, executing, by the map-service provider, a smart contract with the data-service provider.~~

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3. The computer-implemented method of claim 1, wherein transmitting the map data to the data-service provider for processing includes transmitting the map data to the data-service provider for normalizing the map data or discarding irregular data from the map data.

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74. The computer-implemented method of claim 1, wherein the blockchain is a consortium blockchain.

85. The computer-implemented method of claim 1, wherein the map data is collected by the data collector using crowdsourcing.

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~~9. —One or more~~6. A non-transitory, computer-readable storage media encoded with medium storing one or more instructions that, when executed~~executable~~ by ~~one or more processors, cause the one or more processors~~a computer system to perform operations comprising:

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receive, at executing, by a map-service provider associated with a, a first smart contract on a blockchain, map data from with a data collector;

~~transmit, by, wherein~~ the map-service provider, ~~and the data collector are~~
computing devices participating in the blockchain;

~~receiving, at the map-service provider, map data from the data collector;~~

~~executing, by the map-service provider, a second smart contract on the blockchain~~
5 ~~with a data-service provider, wherein the data-service provider is a computing device~~
~~participating in the blockchain;~~

~~transmitting~~ the map data to ~~at~~ the data-service provider for processing;

~~receiving, by the map-service provider, a third smart contract on the~~
10 ~~blockchain with a data provider, wherein the data provider is a computing device~~
~~participating in the blockchain;~~

~~receiving~~, at the map-service provider, non-crowdsourced data from ~~at~~ the data
provider;

~~transmit, by the map-service provider, transmitting~~ the non-crowdsourced data to
the data-service provider for processing with the map data;

15 ~~receive, by the map-service provider, a receiving a~~ request for processed map data
from a service user;

~~retrieve, by the map-service provider retrieving,~~ from the data-service provider,
the processed map data that is generated from the map data and the non-crowdsourced
data; ~~and~~

20 ~~transmit~~ ~~executing~~, by the map-service provider, ~~a fourth smart contract on the~~
~~blockchain with the service user; and~~

~~transmitting~~ the processed map data to the service user in response to the request.

107. The ~~one or more~~ computer-readable ~~storage medium~~ of claim 96, wherein
25 the map-service provider provides automated data consumption or data authorization for
the service user.

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~~11. The one or more computer-readable storage media medium of claim 9, wherein the map-service provider, the data-service provider, and the data provider are computing devices participating in the blockchain.~~

5 ~~12. The one or more computer-readable storage media of claim 9, further comprising: prior to receiving the map data from the data collector, executing, by the map-service provider, a smart contract with the data collector.~~

10 ~~13. The one or more computer-readable storage media of claim 9, further comprising: prior to transmitting the map data to the data-service provider, executing, by the map-service provider, a smart contract with the data-service provider.~~

15 ~~14. The one or more computer-readable storage media of claim 9, wherein transmitting the map data to the data-service provider for processing includes transmitting the map data to the data-service provider for normalizing the map data or discarding irregular data from the map data.~~

20 ~~159. The one or more computer-readable storage media medium of claim 96, wherein the blockchain is a consortium blockchain.~~

~~1610. The one or more computer-readable storage media medium of claim 96, wherein the map data is collected by the data collector using crowdsourcing.~~

~~17. A~~

25 11. A computer-implemented system, comprising:

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

~~one or more computer memory devices interoperably coupled with the one or more computers~~ and

30 ~~one or more computer having tangible, non-transitory, machine-readable storage media encoded with storing one or more~~ instructions that, when executed by the one or

more ~~processors, cause the~~computers, perform one or more ~~processors to~~operations comprising:

~~receive, at executing, by~~ a map-service provider ~~associated with a,~~ a first smart contract on a blockchain, ~~map data from a~~ with a data collector, wherein the map-service provider and the data collector are computing devices participating in the blockchain;

~~transmit, by receiving, at~~ the map-service provider, ~~the~~ map data ~~to~~from the data collector;

~~executing, by the map-service provider, a second smart contract on the blockchain with~~ a data-service provider ~~for,~~ wherein the data-service provider is a computing device participating in the blockchain;

~~transmitting the map data to the data-service provider for~~ processing;

~~receive~~~~executing, by the map-service provider, a third smart contract on the blockchain with a data provider, wherein the data provider is a computing device participating in the blockchain;~~

~~receiving,~~ at the map-service provider, non-crowdsourced data from ~~at~~the data provider;

~~transmit, by the map-service provider,~~transmitting the non-crowdsourced data to the data-service provider for processing with the map data;

~~receive, by the map-service provider, a~~receiving a request for processed map data from a service user;

~~retrieve, by the map-service provider,~~retrieving, from the data-service provider, the processed map data that is generated from the map data and the non-crowdsourced data; ~~and~~

~~transmit~~~~executing,~~ by the map-service provider, a fourth smart contract on the blockchain with the service user; and

transmitting the processed map data to the service user in response to the request.

~~1812.~~ The system of claim ~~1711,~~ wherein the map-service provider provides automated data consumption or data authorization for the service user, ~~and wherein the map-service~~

~~provider, the data-service provider, and the data provider are computing devices participating in the blockchain.~~

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- 5 ~~13. The system of claim 17, further comprising instructions executable by the one or more processors to, prior to receiving the map data from the data collector, executing, by the map-service provider, a smart contract with the data collector.~~

- 10 ~~20. The system of claim 17, further comprising instructions executable by the one or more processors to, prior to 11, wherein transmitting the map data to the data-service provider, executing, by the~~ for processing includes transmitting the map-service provider, a smart contract with data to the data-service provider for normalizing the map data or discarding irregular data from the map data.

- 15 ~~14. The~~ system of claim 11, wherein the blockchain is a consortium blockchain.

15. The system of claim 11, wherein the map data is collected by the data collector using crowdsourcing.