

We Claim:

1. A method for collaborative development of a software component for controlling, monitoring or interfacing with one or more devices configured for process or apparatus monitoring or control within an industrial environment, the method comprising:

receiving at a development server platform, a specification for collaborative development of a software component for controlling, monitoring or interfacing with one or more devices;

receiving participation proposals from a plurality of entities, each participation proposal includes information describing participation parameters that such entity proposes for its participation in the collaborative development of the software component;

selecting from among the plurality of entities, a set of collaborator entities for collaboratively developing the software component, wherein the set of collaborator entities comprises at least two collaborator entities, and wherein the at least two collaborator entities are distinct from the development server platform;

assigning one or more responsibilities associated with the collaborative development of the software component to each collaborator entity within the selected set of collaborator entities, wherein one or more responsibilities assigned to at least a first collaborator entity within the selected set of collaborator entities includes enabling at least a second collaborator entity within the selected set of collaborator entities to access parameter data generated by a first set of devices controlled by the first collaborator entity within the selected set of collaborator entities;

generating an access controlled portal that is associated with the collaborative development of the software component, wherein generating the access controlled portal includes defining:

a first set of access rights associated with the access controlled portal, wherein the first set of access rights defines access or functionality available within the access controlled portal to each collaborator entity among the selected set of collaborator entities; and

a second set of access rights associated with the access controlled portal, wherein the second set of access rights defines access enabled by the first collaborator entity within the selected set of collaborator entities for the second collaborator entity within the selected set of collaborator entities to access the parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities; and

publishing the collaboratively developed software component for implementing the software component to control, monitor or interface with the one or more devices.

2. The method as claimed in claim 1, wherein:

the first set of devices comprises a first set of Internet of Thing (IoT) devices;

and

the one or more devices controlled, monitored or interfaced with by the software component are one or more IoT devices.

3. The method as claimed in claim 1, wherein the software component is configured for:

gathering data from the one or more devices; or

processing data gathered from the one or more devices and automating or implementing one or more tasks or solutions based on the processed data.

4. The method as claimed in claim 1, wherein responsibilities of the second collaborator entity within the selected set of collaborator entities includes generation of a model comprising a data based state detection model or a data based state prediction model, and wherein generation of the model is based on access granted to the second collaborator entity within the selected set of collaborator entities in respect of parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities.

5. The method as claimed in claim 4, wherein the collaboratively developed software component comprises the model generated by the second collaborator entity within the selected set of collaborator entities.

6. The method as claimed in claim 5, wherein publishing the collaboratively developed software component for implementing the software component to control, monitor or interface with, one or more devices comprises:

accessing the software component through the development server platform;
and

configuring a processor based engine to implement one or more of control, monitoring, interfacing, data gathering, data processing or anomaly detection functionality in respect of a second set of devices that is distinct from the first set of devices, wherein the processor based engine comprises or is communicatively coupled with the collaboratively developed software component for implementing the one or more of control, monitoring, interfacing, data gathering, data processing or anomaly detection functionality.

7. The method as claimed in claim 6, wherein the second set of devices comprises a set of IoT devices.

8. The method as claimed in claim 1, wherein the participation parameters within each participation proposal includes at least one of (i) information describing a respective entity's rights or responsibilities that such entity proposes in connection with its participation in collaborative development of the software component, (ii) a list of devices controlled by

the entity corresponding to the participation proposal, from which devices parameter data is proposed to be shared by the entity with one or more other entities from among the set of collaborator entities, or (iii) a duration or validity period for which parameter data from one or more devices controlled by the entity corresponding to the participation proposal is proposed to be shared by the entity with one or more entities from among the set of collaborator entities.

9. The method as claimed in claim 1 wherein the first set of access rights defines any one or more of:

permissions defining access rights of one or more entities within the selected set of collaborator entities in respect of customer data of any other collaborator entity within the selected set of collaborator entities; or

data access permissions concerning processing of customer data of any collaborator entity within the selected set of collaborator entities based on one or more defined data privacy or data protection regulations.

10. The method as claimed in claim 1, wherein the parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities comprises time series parameter data, and wherein the first set of devices are configured to monitor or control one or more assets, devices, components, tags, hardware or software within an industrial environment.

11. The method as claimed in claim 1, wherein responsibilities associated with collaborative development of the software component that have been assigned to each collaborative entity within the selected set of collaborator entities are recorded within a contract associated with the collaborative development of the software component.

12. The method as claimed in claim 11, wherein the contract associated with the collaborative development of the software component includes information identifying the

first set of devices controlled by the first collaborator entity within the selected set of collaborator entities.

13. The method as claimed in claim 11, wherein the contract associated with the collaborative development of the software component is recorded within a distributed ledger data structure.

14. The method as claimed in claim 1, wherein collaborative development of the software component within the access controlled portal, by entities within the set of collaborator entities, is controlled by the access controlled portal based on the first set of access rights and the second set of access rights.

15. The method as claimed in claim 1, wherein the software component comprises computer readable instructions for causing one or more devices to monitor or control one or more assets, devices, components, tags, hardware, software or data parameters within an industrial environment.

16. A system for collaborative development of a controller for one or more devices that are configured for process or apparatus monitoring or control within an industrial environment, the system comprising:

at least one server including a processor and a memory, wherein the at least one server is configured to:

receive, at a development server platform, a specification for collaborative development of a software component for controlling, monitoring or interfacing with one or more devices;

receive participation proposals from a plurality of entities, wherein each participation proposal includes information describing participation parameters that such entity proposes for its participation in the collaborative development of the software component;

select from among the plurality of entities, a set of collaborator entities for collaboratively developing the software component, wherein the set of collaborator entities comprises at least two collaborator entities, and wherein the at least two collaborator entities are distinct from the development server platform;

assign one or more responsibilities associated with the collaborative development of the software component to each collaborator entity within the selected set of collaborator entities, wherein one or more responsibilities assigned to at least a first collaborator entity within the selected set of collaborator entities includes enabling at least a second collaborator entity within the selected set of collaborator entities to access parameter data generated by a first set of devices controlled by the first collaborator entity within the selected set of collaborator entities;

generate an access controlled portal that is associated with the collaborative development of the software component, wherein generating the access controlled portal includes defining:

a first set of access rights associated with the access controlled portal, wherein the first set of access rights defines access or functionality available within the access controlled portal to each collaborator entity among the selected set of collaborator entities; and

a second set of access rights associated with the access controlled portal, wherein the second set of access rights defines access enabled by the first collaborator entity within the selected set of collaborator entities for the second collaborator entity within the selected set of collaborator entities to access the parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities; and

publish the collaboratively developed software component for implementing the software component to control, monitor or interface with, one or more devices.

17. The system as claimed in claim 16, wherein:

the first set of devices comprises a first set of Internet of Things (IoT) devices;
and

the one or more devices controlled, monitored or interfaced with by the software component are one or more IoT devices.

18. The system as claimed in claim 16, wherein the software component is configured for:

gathering data from the one or more devices; or

processing data gathered from the one or more devices and automating or implementing one or more tasks or solutions based on the processed data.

19. The system as claimed in claim 16, wherein the responsibilities of the second collaborator entity within the selected set of collaborator entities includes generation of a model comprising a data based state detection model or a data based state prediction model, and wherein generation of the model is based on access granted to the second collaborator entity within the selected set of collaborator entities in respect of parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities.

20. The system as claimed in claim 19, wherein the collaboratively developed software component comprises the model generated by the second collaborator entity within the select set of collaborator entities.

21. The system as claimed in claim 20, wherein publishing the collaboratively developed software component for implementing the software component to control, monitor or interface with the one or more devices comprises:

accessing the software component through the development server platform;
and

configuring a processor based engine to implement one or more of control, monitoring, interfacing, data gathering, data processing or anomaly detection functionality in respect of a second set of devices that is distinct from the first set of devices, wherein the processor based engine comprises or is communicatively coupled with the collaboratively developed software component for implementing the one or more of control, monitoring, interfacing, data gathering, data processing or anomaly detection functionality.

22. The system as claimed in claim 21, wherein the second set of devices comprises a set of IoT devices.

23. The system as claimed in claim 16, wherein the participation parameters within each participation proposal includes at least one of (i) information describing a respective entity's rights or responsibilities that such entity proposes in connection with its participation in the collaborative development of the software component, (ii) a list of devices controlled by the entity corresponding to the participation proposal, from which devices parameter data is proposed to be shared by the entity with one or more other entities from among the set of collaborator entities, or (iii) a duration or validity period for which parameter data from one or more devices controlled by the entity corresponding to the participation proposal is proposed to be shared by the entity with one or more entities from among the set of collaborator entities.

24. The system as claimed in claim 16, wherein the first set of access rights defines any one or more of:

permissions defining access rights of one or more entities within the selected set of collaborator entities in respect of customer data of any other collaborator entity within the selected set of collaborator entities; or

data access permissions concerning processing of customer data of any collaborator entity within the selected set of collaborator entities based on one or more defined data privacy or data protection regulations.

25. The system as claimed in claim 16, wherein the parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities comprises time series parameter data, and wherein the first set of devices are configured to monitor or control one or more assets, devices, components, tags, hardware or software within an industrial environment.

26. The system as claimed in claim 16, wherein responsibilities associated with the collaborative development of the software component that have been assigned to each collaborator entity within the selected set of collaborator entities are recorded within a contract associated with the collaborative development of the software component.

27. The system as claimed in claim 26, wherein the contract associated with the collaborative development of the software component includes information identifying the first set of devices controlled by the first collaborator entity.

28. The system as claimed in claim 26, wherein the contract associated with the collaborative development of the software component is recorded within a distributed ledger data structure.

29. The system as claimed in claim 16, wherein the collaborative development of the software component within the access controlled portal, by entities within the set of collaborator entities, is controlled by the access controlled portal based on the first set of access rights and the second set of access rights.

30. The system as claimed in claim 16, wherein the software component comprises computer readable instructions for causing one or more devices to monitor or control one or more assets, devices, components, tags, hardware, software or data parameters within an industrial environment.

31. A computer program product for collaborative development of a software component for controlling, monitoring or interfacing with one or more devices configured for process or apparatus monitoring or control within an industrial environment, the

computer program product comprising a non-transitory computer usable medium having a computer readable program code embodied therein, the computer readable program code comprising instructions for implementing within a processor based computing system, the steps of:

receiving at a development server platform, a specification for collaborative development of a software component for controlling, monitoring or interfacing with one or more devices;

receiving participation proposals from a plurality of entities, wherein each participation proposal includes information describing participation parameters that such entity proposes for its participation in the collaborative development of the software component;

selecting from among the plurality of entities, a set of collaborator entities for collaboratively developing the software component, wherein the set of collaborator entities comprises at least two collaborator entities, and wherein the at least two collaborator entities are distinct from the development server platform;

assigning one or more responsibilities associated with the collaborative development of the software component to each collaborator entity within the selected set of collaborator entities, wherein one or more responsibilities assigned to at least a first collaborator entity within the selected set of collaborator entities includes enabling at least a second collaborator entity within the selected set of collaborator entities to access parameter data generated by a first set of devices controlled by the first collaborator entity within the selected set of collaborator entities;

generating an access controlled portal that is associated with the collaborative development of the software component, wherein generating the access controlled portal includes defining:

a first set of access rights associated with the access controlled portal, wherein the first set of access rights defines access or functionality available within the access controlled portal to each collaborator entity among the selected set of collaborator entities; and

a second set of access rights associated with the access controlled portal, wherein the second set of access rights defines access enabled by the first collaborator entity within the selected set of collaborator entities for the second collaborator entity within the selected set of collaborator entities to access the parameter data generated by the first set of devices controlled by the first collaborator entity within the selected set of collaborator entities; and

publishing the collaboratively developed software component for implementing the software component to control, monitor or interface with the one or more devices.