

**CLAIMS**

What I claim is:

1. A system (100) for coordinating a process across at least two participants (105) in a domain to allow interoperability of the participants (105) that operate on different platforms, each participant (105) having at least one resource (306) and one agent (316), wherein a resource (306) refers to a function, data element or operation that can be performed or provided by a participant (105) or agent (316), wherein an agent from a participant (105) requests a resource (306) from another participant (105), and said another participant (105) provides the resource (306) as requested, wherein the process from one participant (105) to another participant (105) is a sequence of resource accesses and includes process steps (319), the system (100) comprising:
  - a. a process specification language (200) identifying at least one relevant terminology for each participant (105), resource (306), agent (316), and process step (319) for the domain, wherein the process specification language (200) is a domain specific programming language that permits specification and programming of the entire system (100), and specification of a high-level process map that defines:
    - what the various process steps (319) are for the process that the system (100) is trying to model and how to perform the various system functions for each of these process steps (319);
    - who the agents (316) are in the process along with their roles in each of the process steps (319);
    - how agents (316) work with the system (100) both in terms of incorporating their designated process steps (319) into the platform framework as well as in their ability to create, access and change information resident in the system (100);
  - b. a specification repository (300) storing information of at least one participant (105), resource (306), agent (316), and process step (319) using terminologies identified in said process specification language (200), wherein each process step (319) is defined by at least one participant (105), resource (306) and/or agent (316), and organized by process step hierarchy (321); wherein the specification repository (300) identifies where and what the resources (306) are for the particular domain by
    - (a) standardizing resource definitions, and
    - (b) building a map of resource locations (307),

wherein the specification repository (300) optimizes how to provide resources (306) to a participant (105), the optimization including identifying the process steps (319) and allocating the process steps (319) into the process step hierarchy (321), and wherein the specification repository (300) determines which participant (105) or agents (316) have access to what resources (306) by

(a) creating a hierarchy (317) and role map (309) for the agents (316) within each participant (105) based on roles that exist within the participant (105) organization, (b) reconciling multiple identities the participant's agent (316) might have at other participants (105) in the system (100) with an identity map (311), and (c) creating a credential map (313) for resource access;

wherein the specification repository (300) defines process steps (319), via:

- defining atomic resources (305) using the most granular resource elements used by participants (105) in the domain;

- organizing the atomic resources (305) into a logical hierarchy (310) for access, security, and functional purposes; and

- mapping resource definitions used by the participants (105) into said hierarchy (310) such that references to specific resources (305) are unambiguous and consistent across participants (105), regardless of differing internal resource definitions;

- wherein each process step (319) is defined as an access to a resource (305, 306) from the resource hierarchy (310), such that creating said resource hierarchy (310) is tantamount to defining every last function and data element made available through the system (100) platform;

c. a process knowledge engine (400) identifying and tracking the relevant process steps (319) in said specification repository (300) for the request from the agent (316) of one participant (105) for the resource (306) from another participant (105) and the provision of the resource (306) as requested;

wherein the process knowledge engine (400) defines and maintains a process sequencing logic, understands the process and stores the sequence of process steps (319) already completed;

wherein the process knowledge engine (400) pulls atomic process steps (319) and information from the resource map (307), the agent role map (309), the identity map (311), and the credential map (313) needed to execute each process step (319) together into a process structure that is adaptable for each participant (105) depending on his requirements; and

d. an execution engine (500) performing the relevant process steps (319) identified by said process knowledge engine (400), managing the agent (316) requesting the resource (306) with respect to the resource (306) based on information stored in said specification repository (300) for the agent (316) and the resource (306), and updating the specification repository (300) with the process steps (319) tracked by said process knowledge engine (400)

wherein the execution engine (500)

- authenticates the agent (316) requesting the resource (306),
- is provided the location of the resource (306) to which the requesting agent (316) is entitled access after authentication and the agent location for the resource (306) from the resource map (307) and from the credential map (313),
- handles authentication for the resource (306) using the agent's (316) credentials,
- accesses the resource (306) using the needed protocols and identifiers,
- delivers the resource (306) in an appropriate format to the requesting agent (316).

2. The system (100) of Claim 1 wherein said specification repository (300) includes at least one map of the agents (309) of one or more participants (105) organized by identity, role, credential, and/or agent hierarchy (317).

3. The system (100) of Claim 2 wherein said process knowledge engine (400) includes at least one map (405) of the process steps (319) between participants (105) organized by a process definition layer (404), a relationship layer (407), and an object hierarchy layer (409).

4. The system (100) of Claim 3 wherein said specification repository (300) includes a knowledge / process state database (323) for storing the update from said execution engine (500) for the process steps (319) tracked by said process knowledge engine (400) using said relationship layer (407), and wherein said execution engine

(500) post-processes the resource (306) to determine its nature and update its knowledge / process state database (323), wherein the execution engine (500) is configured to do document format conversion, optical character recognition and language translation.

5. The system (100) of Claim 3 wherein an agent (316) is assigned to an agent (411) class and a process step (319) is assigned to a transaction class (413), and said relationship layer (407) is organized by said agent class (411) and said transaction class (413).

6. The system (100) of Claim 3 wherein said process definition layer (404) is organized by various sequencing of a plurality of process steps (319).

7. The system (100) of Claim 3 wherein said object hierarchy layer (409) is organized by process step hierarchy (321) and agent hierarchy (317).

8. The system (100) of Claim 2 wherein said execution engine (500) manages the agent (316) with said credential map (313).

9. The system (100) of Claim 4 wherein said execution engine (500) manages the agent (316) with respect to the process steps (319) with said relationship layer (407).

10. The system (100) of Claim 3 wherein the system (100) includes a central system (101) and a local system (102) of at least one participant (105), and said local system (102) maintains a copy of the identity map (311) and process steps map (405) from said central system (101) relevant to the participant (105).

11. A method for coordinating a process across at least two participants (105) in a domain to allow interoperability of the participants (105) that operate on different platforms, each participant (105) having at least one resource (306) and one agent (316), wherein an agent (316) from a participant (105) requests a resource (306) from another participant (105), and said another participant (105) provides the resource (306) as requested, wherein the process from one participant (105) to another participant (105) is a sequence of resource accesses and includes at least one process steps (319), the method steps comprising the steps of:

a. providing a process specification language (200) that identifies at least one relevant terminology for each participant (105), resource (306), agent (316), and process step (319) for the domain;

b. providing a specification repository (300);

c. storing information of at least one participant (105), resource (306), agent (316), and process step (319) using at least one relevant terminology in said specification repository (300), wherein each process step (319) is defined by at least one participant (105), resource (306) and/or agent (316), and organized by process step hierarchy (321);

d. identifying the relevant process steps (319) in said specification repository (300) for the request from the agent (316) of one participant (105) for the resource (306) from another participant (105) and the provision of the resource (306) as requested;

e. performing the relevant process steps (319) identified;

f. managing the agent (316) requesting the resource (306) with respect to the resource (306) based on information stored in said specification repository (300) for the agent (316) and the resource (306);

g. tracking the relevant process steps (319);

h. providing a knowledge / process state database (323); and

i. updating said knowledge / process state database (323) with the process steps (319) tracked;

the method further comprising

i.1 storing standardized resource definitions and building a map of resource locations (307) in the specification repository (300) to identify where and what the resources (306) are for the particular domain;

i.2 optimizing how to provide resources (306) to a participant (105), the optimization including identifying the process steps (319) and allocating the process steps (319) into the process step hierarchy (321);

i.3 determining which participants (105) or agents (316) have access to which resources (306) by creating a hierarchy (317) and role map (309) for the agents (316) within each participant (105), reconciling multiple identities the participant's agent (316) might have at other participants (105) with an identity map (311), and creating a credential map (313) for resource access;

i.4 defining process steps (319), via: defining atomic resources (305) using the most granular resource elements used by participants (105) in the domain; organizing the atomic resources (305) into a logical hierarchy (310) for access, security, and

functional purposes; and mapping the resource definitions used by the participants (105) into said hierarchy (310) such that references to specific resources (305) are unambiguous and consistent across participants (105), regardless of differing internal resource definitions; wherein each process step (319) is defined as an access to a resource (305, 306) from the resource hierarchy (310), such that creating said resource hierarchy (310) is tantamount to defining every last function and data element made available through the system (100) platform;

i.5 defining and maintaining a process sequencing logic;

i.6 pulling atomic process steps (319) and information from the resource map (307), the agent role map (309), the identity map (311), and the credential map (313) needed to execute each process step (319) into a process structure that is adaptable for each participant (105) depending on their requirements;

i.7 authenticating the agent (316) requesting the resource (306),

i.8 requesting the resource (306) to which the agent (316) is entitled access, wherein the location of the resource (306) and the agent location for the resource (306) are provided from the resource map (307) and from the credential map (313),

i.9 handling authentication for the resource (306) using the agent's (316) credentials,

i.10 accessing the resource (306) using the needed protocols and identifiers, and

i.11 delivering the resource (306) in an appropriate format to the requesting agent (316).

12. The method of Claim 11 further comprising the steps of:

l. organizing the agents (316) of one or more of the participants (105) by identity, credential and/or agent hierarchy; and

m. providing at least one map in said specification repository (300) organized by said identity, role, credential, and/or agent hierarchy.

13. The method of Claim 11 further comprising the steps of:

n. organizing the process steps (319) between participants (105) by a process definition layer (404), a relationship layer (407), and an object hierarchy layer (409); and

o. providing at least one map organized by said process definition layer (404), said relationship layer (407) and said object hierarchy layer (409).

14. The method of Claim 13 further comprising the steps of:

p. assigning an agent (316) to an agent class (411); and

q. assigning a process step (319) to a transaction class (413);

wherein said relationship layer (407) is organized by said agent class (411) and said transaction class (413).

15. The method of claim 13 further comprising the step of:

r. organizing various sequencing of a plurality of process steps (319) in said process definition layer (404).

16. The method of claim 13 wherein said object hierarchy layer (409) is organized by process step hierarchy (321) and agent hierarchy (317).

17. The method of Claim 13 wherein said relationship layer (407) is used for the tracking of the relevant process steps (319).

18. The method of Claim 13 wherein said relationship layer (407) is used for the managing of the agent (316).