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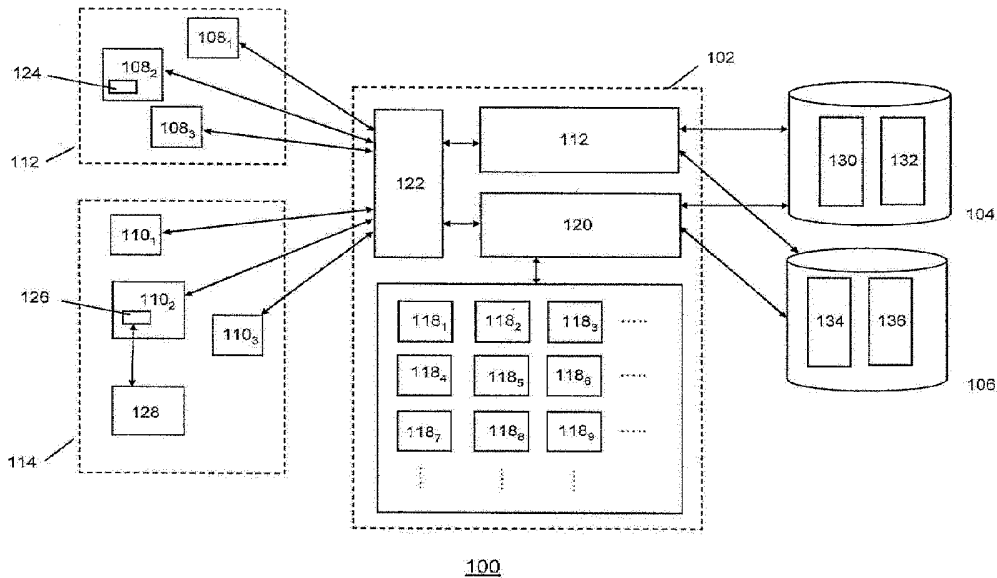
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54 Metadata driven process control platform.

57 A computer-based metadata driven process control system for use by at least one process-controlled organization and a method for use in such system are described. The system comprises a plurality of metadata-configurable elementary functions hosted on server system, wherein each of said elementary functions comprises at least a data input, a data output and a metadata input. A database stores data and metadata associated with said organization, wherein the metadata identify the elementary functions used in a process and a sequence in which the elementary functions are executed in said process. The metadata are further used for configuring the identified elementary functions in said process. A process control-module hosted on said server system communicates with a terminal and the database and is configured to execute a process on the basis of a process execution request received from the terminal.



NL C 2007246

Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift komt overeen met de oorspronkelijk ingediende stukken.

Metadata driven process control platform

Field of the invention

5 The invention relates to a metadata driven process control platform, and, in particular, though not exclusively, to a computer-based metadata driven process control system, a computer-implemented method for controlling the execution of a process and a computer program product using such method.

10 Background of the invention

Currently large, process-driven organizations such as a business organization or an industrial manufacturing organization use specific software platforms in order to control and execute processes specific to the organization. The software platform may be specifically designed for a specific organization or, alternatively, the platform may be built using generic modules provided by vendors, which during an implementation phase are modified for a specific organization. These approaches are rather inflexible and do not allow flexible adaptation to changes in the organization.

Another approach is the use of so-called metadata driven applications wherein a generically designed software application may be customized using metadata. The metadata allows specific pre-configuration of an application so that data may be processed in accordance with the requirements within a specific organization. An example of such metadata driven software application is described in US2005/0160060.

30 One problem related to the prior art is that the proposed schemes only provide limited flexibility in customization in the sense that an application is pre-configured such that once an application is executed the configuration is fixed .

35 Another problem with the prior art relates to the fact that over a long period time customization may change many times. Moreover, at some point in time it may become necessary to update at least part of the source code of a

metadata configurable application. It is desired that a process control system for a process-driven organization is able to handle such modifications in the customization of processes executed by that system.

5 Hence, there is a need in the prior art for a metadata driven system and method, which provide improved customization of processes executed by such system and which are robust over time and eliminate or at least greatly reduce problems mentioned above.

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Summary of the invention

 It is an object of the invention to reduce or eliminate at least one of the drawbacks known in the prior art. In a first aspect the invention may relate to computer-based metadata driven process control system for use by at least one process-controlled organization, wherein said system may comprise: a plurality of metadata-configurable elementary functions hosted on server system, each of said elementary functions comprising at least a data input, a data output and a metadata input; at least one database for storing data and metadata associated with said organization, said metadata comprising process metadata for identifying the elementary functions used in a process associated with said organization and for determining one or more sequences in which said elementary functions can be executed in said process and configuration metadata for configuring the identified elementary functions in said process; a process control module hosted on said server system and configured to communicate with at least a first terminal and said database and to execute a process on the basis of a process execution request received from said terminal; and wherein said process control module may be further configured to retrieve process metadata associated with said requested process for identifying elementary functions associated with said process and at least one execution sequence of said elementary functions; to retrieve first configuration metadata for configuring a first elementary function associated with said process; to configure

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said first elementary function on the basis of said first configuration metadata; to generate first output data by executing said first configured elementary function on the basis of said input data; and to retrieve second configuration metadata for configuring a second elementary function associated with said process on the basis of at least part of said output data.

Hence, during the execution of the process by the process execution module the output of one or more previous elementary functions may determine the configuration of the next elementary function. This way, part of the process intelligence is transferred to the metadata level so that changes in the process may be easily modified by modifying the process- and configuration metadata associated with a process without the requirement of changes in the source code. Such changes may be simply introduced by an authorized user. Further, the metadata driven process control platform using a set of elementary functions is organization neutral thereby enabling the platform to be used at the same time by different organizations. Adaptation of a process to the requirements of an organization can be achieved by adapting the metadata.

In one embodiment, at least part of said data and metadata may be associated with time-stamp information, said time-stamp indicating the point in time the data or metadata was created.

In another embodiment said data and metadata may be stored as initial time-stamped data and metadata and modifications to the initial data and metadata, wherein each modification comprises a time-stamp at which the modification in the initial data and/or metadata occurred.

In yet another embodiment said process control module may be configured to retrieve an initial data and metadata associated with a process identified in a process request and to retrieve the time-stamped modifications associated with said initial set of data and metadata up to the time identified in the process request.

In a further embodiment said process control module may be configured to combine the retrieved initial data and

metadata and the retrieved modifications to said initial data and metadata into data and metadata associated with the time defined in the request.

5 In one variant said process control module may be configured to select configuration metadata associated with an elementary function on the basis of said time-stamp information.

10 Using time-stamp information the system is able to efficiently store and process historical data and metadata thereby providing improved archiving functionality. Furthermore, on basis of the time-stamped metadata the platform is capable to reconstruct the process, which was used at a particular point in time and execute the process on the basis of the metadata and data then used. This way the
15 platform may efficiently cope with backwards compatibility issues.

In another variant said system may further comprise a process editor module for accessing and modifying said metadata.

20 In yet another variant said process editor module may be configured to time-stamp modified metadata and to store said modified time-stamped metadata in said database.

25 In a further variant said process control module may be connected via said interface to one or more first terminals associated with a first process-controlled organization and to one or more second terminal associated with a second process-controlled organization, wherein the data and metadata associated with said first and second process-controlled
30 organization are stored in a first and second database respectively.

In one embodiment said at least one process-controlled organization may be an administrative organization or an industrial automated product manufacturing organization.

35 In another embodiment said terminal may comprise a graphical user interface and wherein at least one of said elementary functions is a metadata configurable elementary

display function for displaying data associated with said process on said terminal.

In yet another embodiment said terminal may comprise a data controller interface connected to a process controller in an automated manufacturing plant and wherein at least one of said elementary functions is a metadata driven manufacturing process.

In a further aspect the invention may relate to a computer-implemented method for use in a system according as described above wherein the said method may comprise:
retrieving process metadata associated with a requested process for identifying elementary functions associated with a process and at least one execution sequence of said elementary functions; retrieving first configuration metadata for configuring a first elementary function associated with said process; to configure said first elementary function on the basis of said first configuration metadata; generating first output data by executing said first configured elementary function on the basis of said input data; and, retrieving second configuration metadata for configuring a second elementary function associated with said process on the basis of at least part of said output data.

The invention may also relate to a computer program product, the computer program product comprising software code portions configured for, when run on a computer, executing a method as described above.

The invention will be further illustrated with reference to the attached drawings, which schematically will show embodiments according to the invention. It will be understood that the invention is not in any way restricted to these specific embodiments.

Brief description of the drawings

Fig. 1 depicts a schematic of a metadata driven process control system according to one embodiment of the invention.

Fig. 2 depicts at least part of a metadata driven process control system according to another embodiment of the invention.

Fig. 3 depicts a flow diagram associated with a metadata driven process according to one embodiment of the invention.

Fig. 4 depicts at least part of a metadata driven process control system according to another embodiment.

Fig. 5 depicts a flow diagram associated with a metadata driven process according to another embodiment of the invention.

Detailed description

Fig. 1 depicts a schematic of a computer system **100** configured for executing metadata driven processes according to one embodiment of the invention. In particular, **Fig. 1** discloses an example of computer system comprising a server system **102** connected to one or more databases **104,106**. Terminals **108₁-108₃,110₁-110₃**, associated with different organizations **112,114** may be connected to the servers system via one or more communications networks such as the Internet, a local network (LAN) and/or a wide area network (WAN).

The server system **102** may be configured to host a process management platform comprising a set of elementary functions **118₁-118₉**, and a process execution module **120** configured to execute the elementary functions on the basis of data and metadata.

The process management platform may be configured to centrally control processes of several organizations. Such processes may e.g. include administrative and/or logistic processes associated with business organizations, e.g. customer relationship management (CRM) or enterprise resource planning (ERP), and/or manufacturing processes associated with industrial manufacturer organization, e.g. the automated production process in a plant, e.g. a chemical plant or a power plant, or in a factory.

Entities associated with an organization requiring access to (part of the) the process management platform, e.g. users within a business organization and/or process control modules in a industrial manufacturing organization, may
5 communicate with the process management platform using a terminal. Communication between a terminal and the process execution module is enabled through an interface module **122** associated with the server system.

A terminal may be implemented as a computer
10 comprising one or more interfaces, e.g. a user interface **124** allowing to receive and visualize data received from the platform and to send requests to the platform. Alternatively and/or in addition, a terminal may comprise a data interface **126** for one or more manufacturing controllers **128** allowing the
15 process management platform to send and receive process control data for managing a manufacturing process.

The terminals and the server system typically comprise an operating system (OS) comprising a kernel which manages resources, e.g. one or more Central Processing Units
20 (CPUs), a memory for storing program instructions and data and Input/Output (I/O) devices. In one embodiment, a terminal may execute client software, which uses HTTP type web sessions and e.g. the secure socket layer (SSL) protocol and/or Security Assertion Mark-up Language (SAML) for providing secure data
25 exchange with the server system.

A process controlled by the platform may be defined as sequential execution of a number of elementary functions. For example, in an administrative process the process may be defined as the sequential execution of a number of elementary
30 administrative functions including e.g. a presenting forms to a user, receiving user input, calculating output data on the basis of the user input, storing the output data in a database, etc.

An elementary function may e.g. relate to user input
35 retrieval through a form. The function may request data from the end user by presenting a form to a user, which is dynamically generated based on the current process data, process metadata and configuration metadata. Another

elementary function may relate to generating and sending a communication message, e.g. an e-mail based on the current process data, process metadata and configuration metadata. Yet another example of an elementary function may relate to
5 executing an external service, e.g. calling XML web service. Such function may allow the process control module to call an external XML web service using e.g. the Simple Object Access Protocol (SOAP) or XML/RPC. Parameters and input data for the external service are determined runtime based on the current
10 process data, process metadata and configuration metadata.

Similarly, a manufacturing process may be defined as the execution of a sequence of elementary manufacturing functions including receiving setting parameters for a chemical reactor, configure input and output valves in
15 accordance with the parameters, start reactor process, monitor one or more process parameters during reactor process, etc.

Each elementary function **118₁-118₉**, may be generically implemented such that it is organization neutral thereby allowing to be used for processes of different organizations
20 without any modification to the source code. The elementary functions may be associated with different functional layers of the platform e.g. security, system configuration, user interface, data access, etc. An elementary function may be implemented as a software module or a combined
25 software/hardware module, which may be executed on the basis of metadata **130,134** and data **132,136** stored in one or more databases **104,106**. In particular, metadata may be used to configure the function and the data may be used as input data for the thus configured function.

30 For example, an elementary function in an administrative process may relate to the creation of an invoice document. Structures of such documents may depend on the standard used by the organization generating the invoice, the standard used by the organization the invoice is sent to,
35 the type of products and/or services the invoice relates to etc. The invoice metadata may configure the elementary invoice data function to produce a specific invoice document used by a specific organization. This way, the invoice metadata sets may

configure the elementary invoice function to produce different invoice documents. Similarly, an elementary function in an industrial manufacturing process may relate a generic chemical reaction chamber control function for controlling the supply of a number of materials to the reaction chamber.

Fig. 2 schematically depicts the functioning of the metadata driven process control platform **200** in more detail. The metadata driven process control platform comprises a process execution module **202**, connected via an interface **204** to a terminal **206** and to at least one database **208** in a similar way as described with reference to the system depicted in **Fig. 1**.

The processes associated with an organization may be defined in terms of metadata **210** stored in the database wherein the metadata comprises process metadata **212** and configuration metadata **214**. The process metadata may specify how the process is executed and may include e.g. identification information identifying the elementary functions used in each process and process scheduling information for defining the sequence in which the elementary functions are executed and the (logical) conditions under which a function is executed.

Configuration metadata may define a specific configuration of an elementary function. In this particular example the process metadata defines (part of) a particular process comprising four different elementary functions **216₁-216₄**. Each function is implemented as a module comprising at least one data input **218**, a data output **220** and an metadata input **222**.

The metadata may define conditional execution of an elementary function. In one embodiment, depending on the input data for an elementary function, different configuration metadata defining different function configurations may be selected for an elementary function. This way, the process data may determine how an elementary function is configured during the execution of a process.

For example, if an input variable **218** of an elementary function is smaller than a particular threshold

value, first configuration metadata may be used to configure the elementary function. If the input variable is larger than the threshold value second configuration metadata may be used to configure the elementary function. This way the configuration
5 an elementary document presentation function displaying a document to a user may be changed on the basis of document data size or any other relevant parameter or combinations thereof.

In another embodiment, the metadata may make the
10 selection of a subsequent elementary function in a process dependent on the output of an elementary function. For example, in one embodiment, if an output variable of an elementary function is smaller than a particular threshold value a first elementary function may be selected and
15 configured by first configuration metadata by the process execution module and if the input variable is larger than a second elementary function is selected and configured by second configuration metadata.

This way, the platform provides process control
20 wherein elementary functions are dynamically configured and/or selected during the execution of a process, whereby part of the process logic is mitigated to the metadata level thereby providing improved flexibility of process definition and process modifications.

Fig. 3 depicts at least part of a process flow **300**
25 executed by the platform as described with reference to **Fig. 2**. A process request may be sent to the process execution module which may start the process (step **302**). The request may comprise a process identifier, one or more input parameters and reference to user data stored on a database, which is used
30 as input data for the process. Upon reception of the request, the process execution module may access the database in order to retrieve the process metadata associated with the process identified in the request (step **304**). On the basis of the
35 process metadata the process execution module identifies the first elementary function of the process and its associated first configuration metadata (step **306**).

The process execution module subsequently configures the first elementary function using the configuration metadata (step **310**), retrieves the user data from the database (step **312**) and executes the thus configured elementary function using the user data as first input data in order to produce first output data (step **314**).

When the process execution module receives the first output data, it determines the next (second) elementary function in the process on the basis of the process metadata (step **316**). After having determined the second elementary function, it retrieves second configuration metadata for configuring the second elementary function (step **318**) and executes the configured second elementary function on the basis of first output data (step **320**).

The process execution module repeats the same steps for the third and fourth elementary function. Hence, during the execution of the process by the process execution module the output of one or more previous elementary functions may determine the configuration of the next elementary function. This way, part of the process intelligence is transferred to the metadata level so that changes in the process may be easily modified by modifying the process- and configuration metadata associated with a process without the requirement of changes in the source code. Such changes may be simply introduced by an authorized user. Further, the metadata driven process control platform using a set of elementary functions is organization neutral thereby enabling the platform to be used at the same time by different organizations. Adaptation of a process to the requirements of an organization can be achieved by adapting the metadata.

Fig. 4 depicts part of the metadata driven process control platform according to another embodiment. In particular, **Fig. 4** (A) depicts at least part of a process control system comprising an editor module **402** connected via an interface **406** to a terminal **408**. If a process within an organization requires a modification, an authorized person such as process supervisor, may access the metadata stored in the metadata database through the terminal and change the

metadata, i.e. the process- and configuration metadata, via the process editor module **402**. This way it is possible to adapt the processes executed by the process management platform without re-compilation of code.

5 In one embodiment, modifications in the process- and configuration metadata introduced through the process editor module may be time-stamped. Similarly, data associated with a process may be time-stamped. Different time-stamped sets of metadata and/or data associated with different versions of a
10 process **412₁**, **412₂** may be stored in the database. This way, process modifications may be efficiently traced, achieved by the platform and re-executed.

 To store and retrieve the time-stamped data and metadata, in one embodiment, a mechanism is used in which the
15 (original) initially used data and metadata and all modifications to the data and metadata with the time-stamp at which they occurred are stored separately. The current version of the data can be stored as a cache for performance purposes.

 When retrieving data and metadata for a specific
20 moment in time, the initial data and metadata and their modifications up to the requested time-stamp are retrieved. The process control module combines the initial data and the modifications to a set of data and metadata as it was at the requested moment in time. In the default case, the system will
25 retrieve data and metadata for the date and time at which the request is made. This way the system is able to efficiently store and process historical data and metadata thereby providing improved archiving functionality.

 Further, although the elementary functions are
30 generically defined and may be configured and customized though the configuration metadata sometimes it may be required to modify an elementary function. A platform supervisor may introduce a new version of an elementary function **414₁-414₃** in the system using the process editor module. In order to cope
35 with such changes, in one embodiment, an elementary function may be time-stamped. The process metadata may define which version - the most recent or an earlier version - of an elementary function is to be used in a particular process.

Fig. 4 (B) schematically depicts part of the platform wherein modifications in the process are introduced by an authorized user of an organization. The process execution module **404** may execute a process defined by metadata stored in the database in a similar way as described with reference to **Fig. 2**. In this case however, different metadata versions associated with a process are stored in the database and a user is interested in executing an earlier (time-stamped) version **412₂** of the process. As the process includes an elementary function of which different versions are stored in the system, the metadata may determine to execute the process on the basis of an earlier version. This process is depicted more in detail in the process flow **500** of **Fig. 5**.

In this example the user may request execution of the same process as described with reference to **Fig. 2**. A user is interested in the execution of the process as defined at a certain point in the past. The process request sent to the process execution module (step **502**) therefore comprises time information associated with the process.

Upon reception of the request, the process execution module may access the database in order to access the process metadata associated with the process identified in the request in a similar way as described with reference to **Fig. 2**. As the request comprises time information, the process execution module retrieves the initial (earliest) time-stamped data and metadata and their time-stamped modifications which are stored thereafter up to the time identified in the request (step **506**). The process control module may thereafter combine the initial data and the retrieved modifications to a set of data and metadata associated with the time defined in the request (step **508**).

Thereafter, the process may be executed in a similar way as described with reference to **Fig. 3**, i.e. identify the first elementary function of the process and its associated first configuration metadata (step **510**); configuration of the first elementary function using the configuration metadata (step **512**), retrieval of user data from the database (step

514) and execution of the thus configured elementary function (step 516).

When the process execution module receives the first output data, it determines the next (second) elementary function in the process on the basis of the process metadata (step 518). In this case, the second elementary function has three (time-stamped) versions. On the basis of the time information the process execution module then determines the correct version of the second elementary function (step 520), retrieves second configuration metadata associated with this version (step 522) and executes the configured second elementary function on the basis of first output data (step 522).

Obviously, an earlier process version may comprise modifications in the process- and/or configuration metadata so that the result produced by the execution of the process may differ from the result produced by the process illustrated in Fig. 2. As described with reference to Fig. 3-5, the platform stores a timeline of the modifications associated metadata and elementary functions such that - if required - the platform may execute an achieved process. On the basis of the time-stamped metadata the platform is capable to reconstruct the process, which was used at a particular point in time and execute the process on the basis of the metadata and data then used. This way the platform may efficiently cope with backwards compatibility issues.

It is also to be understood that any feature described in relation to any one embodiment may be used alone, or in combination with other features described, and may also be used in combination with one or more features of any other of the embodiments, or any combination of any other of the embodiments. One embodiment of the invention may be implemented as a program product for use with a computer system. The program(s) of the program product define functions of the embodiments (including the methods described herein) and can be contained on a variety of computer-readable storage media. Illustrative computer-readable storage media include, but are not limited to: (i) non-writable storage media (e.g.,

read-only memory devices within a computer such as CD-ROM
disks readable by a CD-ROM drive, flash memory, ROM chips or
any type of solid-state non-volatile semiconductor memory) on
which information is permanently stored; and (ii) writable
5 storage media (e.g., floppy disks within a diskette drive or
hard-disk drive or any type of solid-state random-access
semiconductor memory) on which alterable information is
stored. Furthermore, equivalents and modifications not
described above may also be employed without departing from
10 the scope of the invention, which is defined in the
accompanying claims.

CONCLUSIES (NL VERTALING)

1. Gecomputeriseerd, op basis van metadata aangedreven procesbesturingssysteem voor gebruik door ten minste één procesaangestuurde organisatie omvattende:

een veelvoud van op basis van metadata

5 configureerbare elementaire functies die op een server system draaien, elke van genoemde elementaire functies ten minste omvattende een data-input, een data-output en een metadata-input;

10 ten minste één database voor het opslaan van data en metadata behorende bij genoemde organisatie, genoemde metadata omvattende procesmetadata voor het identificeren van de elementaire functies die gebruikt worden in een proces van genoemde organisatie en voor het bepalen van één of meerdere volgorden waarin genoemde elementaire functies in genoemd
15 proces uitgevoerd kunnen worden en configuratiemetadatum voor het configureren van de geïdentificeerde elementaire functies in genoemd proces;

een procescontrolemodule die op genoemd serversysteem draait en geconfigureerd is om te communiceren met ten minste
20 een eerste terminal en genoemde database en om een proces uit te voeren op basis van een van genoemde terminal ontvangen procesexecutieverzoek

waarbij genoemde procescontrolemodule verder geconfigureerd is om procesmetadata voor het identificeren van
25 elementaire functies behorende bij genoemd verzocht proces en ten minste een uitvoeringsvolgorde van genoemde elementaire functies op te halen; om eerste configuratiemetadatum voor het configureren van een eerste elementaire functie behorende bij genoemd proces op te halen; om genoemd eerste elementaire
30 functie op basis van genoemde eerste configuratiemetadatum te configureren; om eerste outputdata te genereren door uitvoering van genoemde eerste geconfigureerd elementaire functie op basis van genoemde inputdata; en om tweede configuratiemetadatum voor het configureren van een tweede

elementaire functie behorende bij genoemd proces op te halen op basis van ten minste een deel van genoemde outputdata.

2. Systeem volgens conclusie 1, waarbij ten minste
5 deel van genoemde data en metadata geassocieerd is met
tijdstempelinformatie waarbij genoemde tijdstempel het
tijdstip aangeeft wanneer de data of metadata gecreëerd werden.

3. Systeem volgens conclusie 2, waarbij genoemde data
10 en metadata opgeslagen worden als initiële tijdsgestempelde
data en metadata en wijzigingen van de initiële data en
metadata, waarbij elke wijziging een tijdsstempel omvat
wanneer de wijziging in de initiële data en/of metadata
plaatsvond.

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4. Systeem volgens claims 2 en 3, waarbij de
procescontrolemodule is geconfigureerd om initiële data en
metadata behorende bij een proces zoals geïdentificeerd in een
procesverzoek op te halen en om bij genoemde initiële set van
20 data en metadata behorende tijdsgestempelde wijzigingen tot en
met de in het procesverzoek genoemde tijd op te halen.

5. Systeem volgens conclusies 4, waarbij genoemd
procescontrolemodule is geconfigureerd om de opgehaalde
25 initiële data en metadata en om de opgehaalde wijzigingen in
genoemde data en metadata behorende bij de in het verzoek
gedefinieerde tijd te combineren.

6. Systeem volgens één van conclusies 2-5, waarbij
30 genoemde procescontrolemodule geconfigureerd is om
configuratiemetadatum behorende bij een elementaire functie op
basis van genoemde tijdstempel informatie te selecteren.

7. Systeem volgens één van voorgenoemde conclusies,
35 waarbij genoemd systeem verder een proceseditormodule voor het
verkrijgen van toegang tot een proces en voor het wijzigen van
genoemde metadata omvat.

8. Systeem volgens conclusie 7, waarbij genoemde proceseditor module geconfigureerd is om gewijzigde metadata te voorzien van een tijdstempel en om genoemde gewijzigde
5 tijdgestempelde metadata in genoemde database op te slaan.

9. Systeem volgens één van conclusies 1-8, waarbij genoemde procescontrole module via een interface verbonden is met één of meerdere eerste terminals behorende bij een eerste
10 procesgestuurde organisatie en bij één of meerdere tweede terminals behorende bij een tweede procesgestuurde organisatie, waarbij de data en metadata behorende bij genoemde eerste en tweede procesgestuurde organisatie opgeslagen zijn in een eerste respectievelijk tweede database.
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10. Systeem volgens één van de conclusies 7-9, waarbij genoemde ten minste eerste procesgestuurde organisatie een administratieve organisatie of een industriële geautomatiseerde productvervaardigingsorganisatie is.
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11. Systeem volgens één van de conclusies 1-10, waarbij genoemde terminal een grafische gebruikersinterface omvat en waarbij ten minste één van genoemde elementaire functies een metadata configureerbare elementaire
25 afbeeldingsfunctie is voor het op een scherm afbeelden van data behorende bij genoemd proces.

12. Systeem volgens één van conclusies 1-10, waarbij genoemde terminal een datacontroller interface omvat die met
30 een in een geautomatiseerde fabriek bevindende procescontroller verbonden is.

retrieving first configuration metadata for
configuring a first elementary function associated with said
process;

35 to configure said first elementary function on the basis of said first configuration metadata;

13. Computer-geïmplementeerde methode voor gebruik in een system volgens één van de conclusies 1,2-7, waarbij de methode omvat:

5 ophalen van procesmetadata behorende bij een verzocht proces voor het identificeren van elementaire functies behorende bij een proces en ten minste één volgorde van uitvoeren van genoemde functies;

10 ophalen van eerste configuratiemetadata voor het configureren van een eerste elementaire functie behorende bij genoemd proces;

configureren van genoemde eerste elementaire functie op basis van genoemde eerste configuratiemetadata;

15 genereren van eerste outputdata door het uitvoeren van genoemde eerste geconfigureerde elementaire functie op basis van genoemde inputdata; en,

20 ophalen van tweede condiguratiemetadata voor het configureren van een tweede elementaire functie behorende bij genoemd proces op basis van ten minste een deel van genoemde outputdata.

14. Een computerprogrammavoortbrengsel omvattende delen van softwarecode die geconfigureerd zijn om wanneer die op een computer uitgevoerd worden een methode volgens claim 13 uit te voeren.

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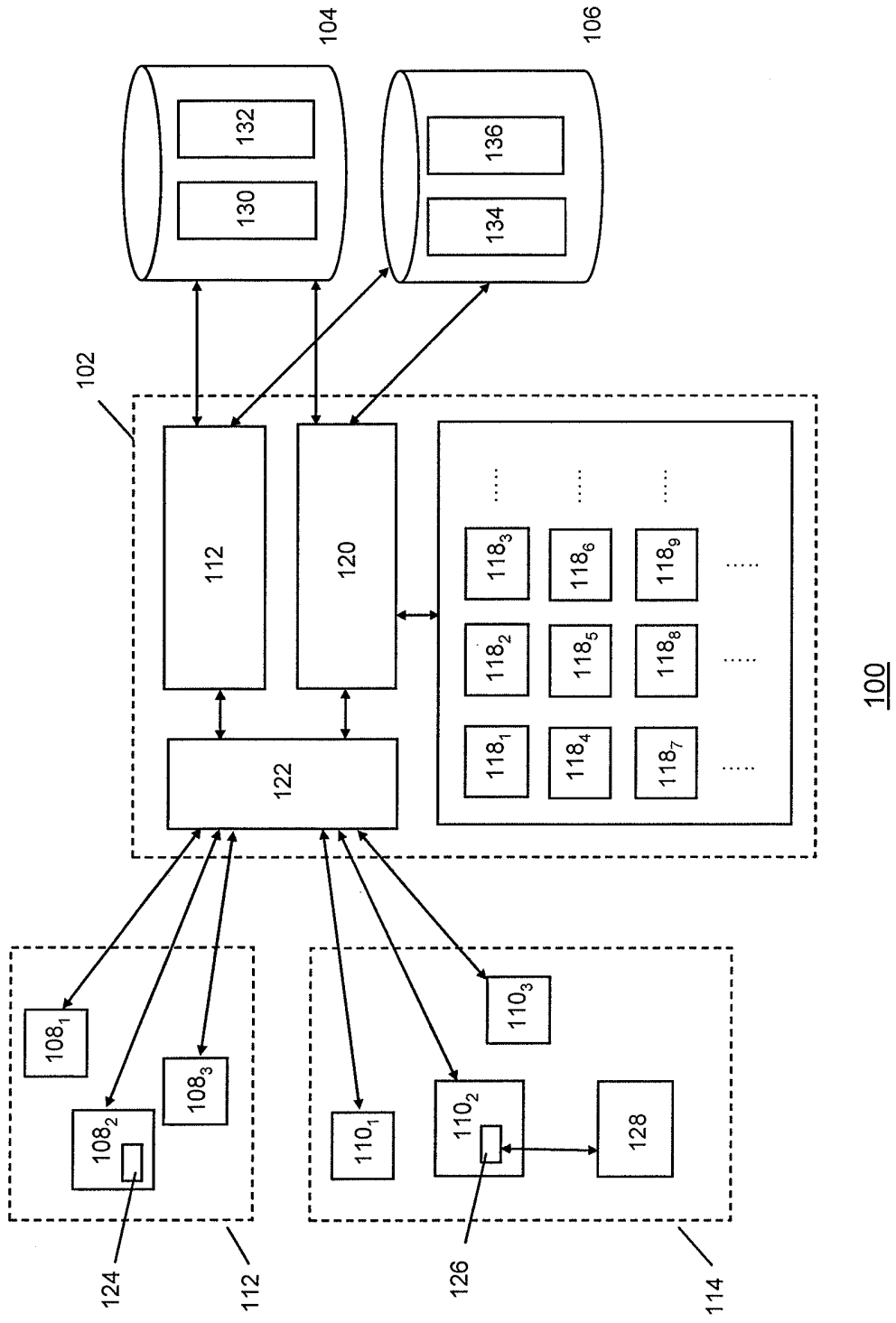


Figure 1

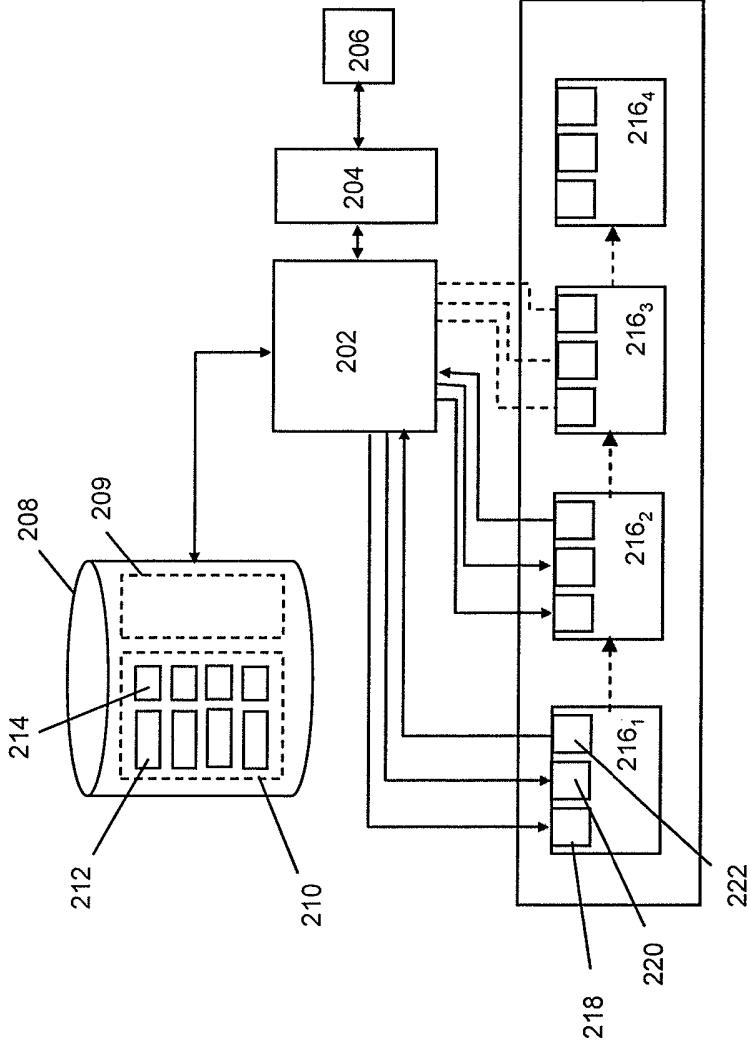


Figure 2

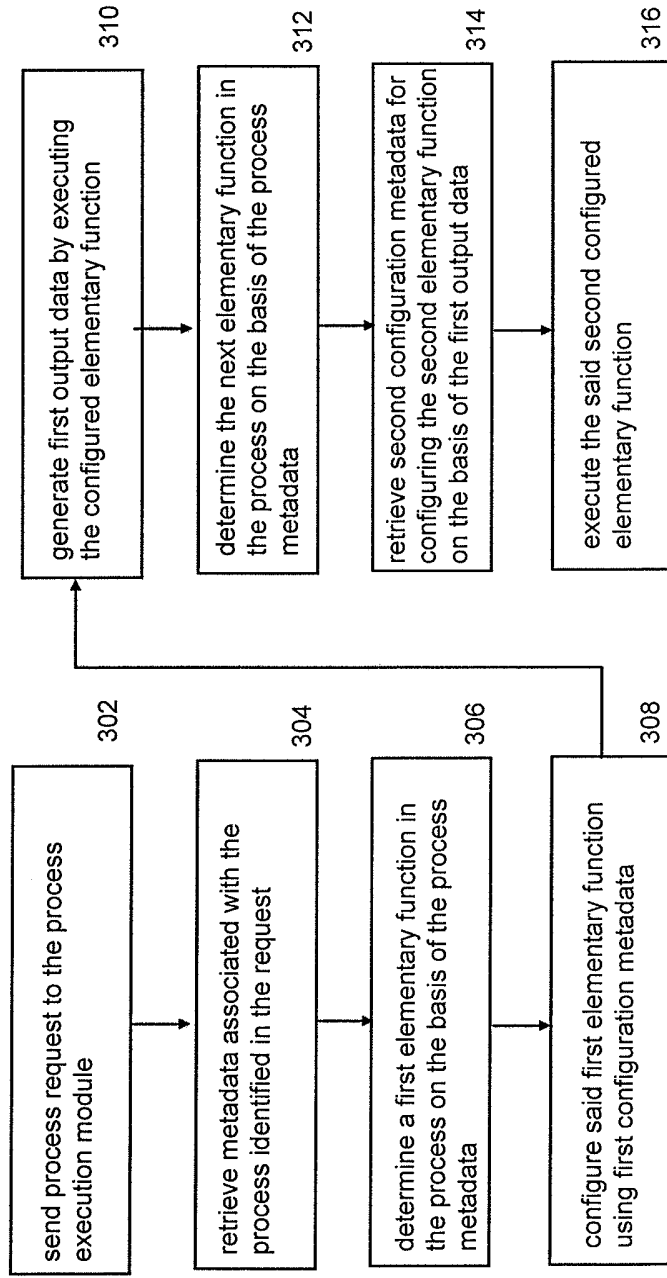


Figure 3

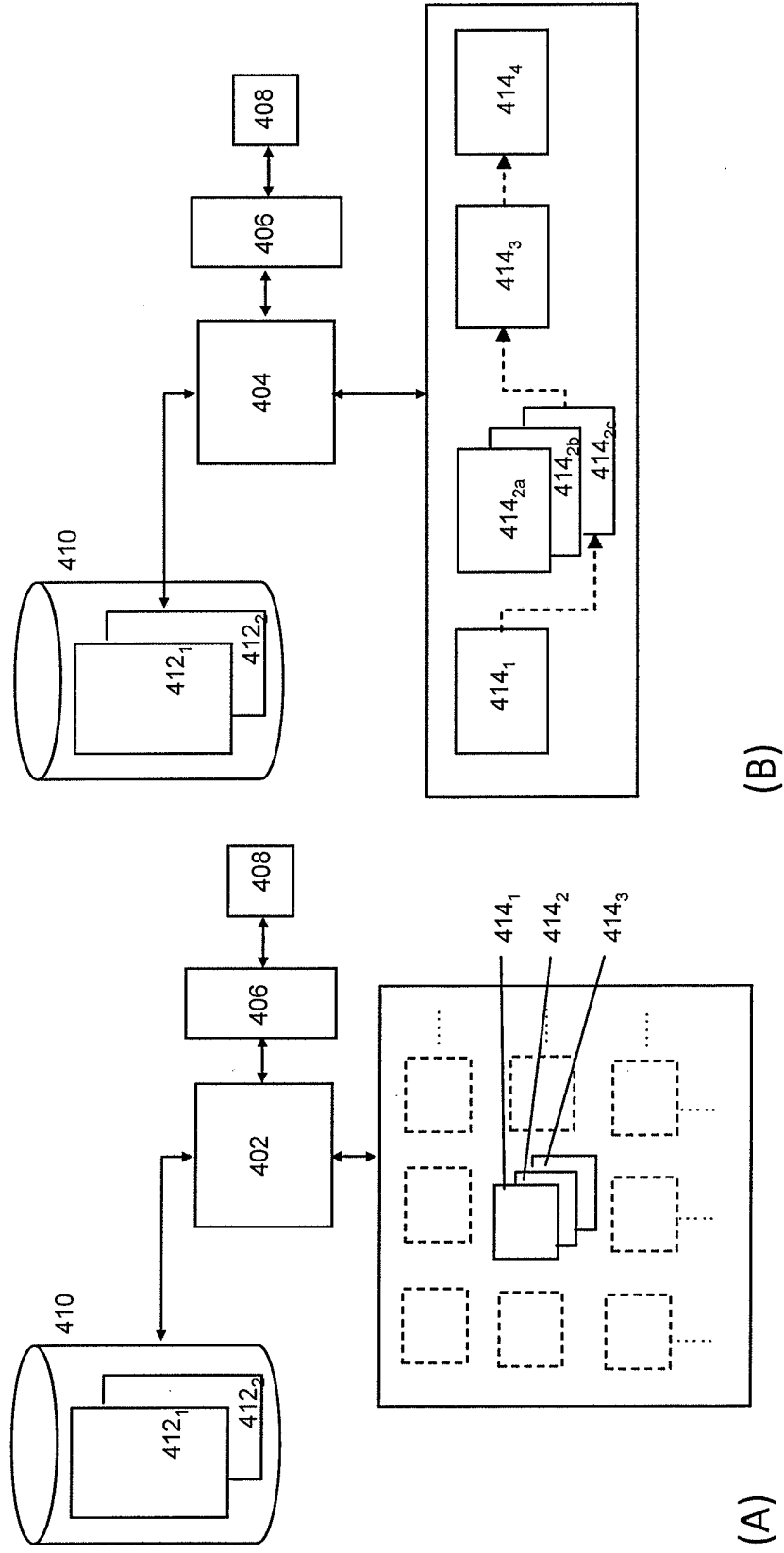
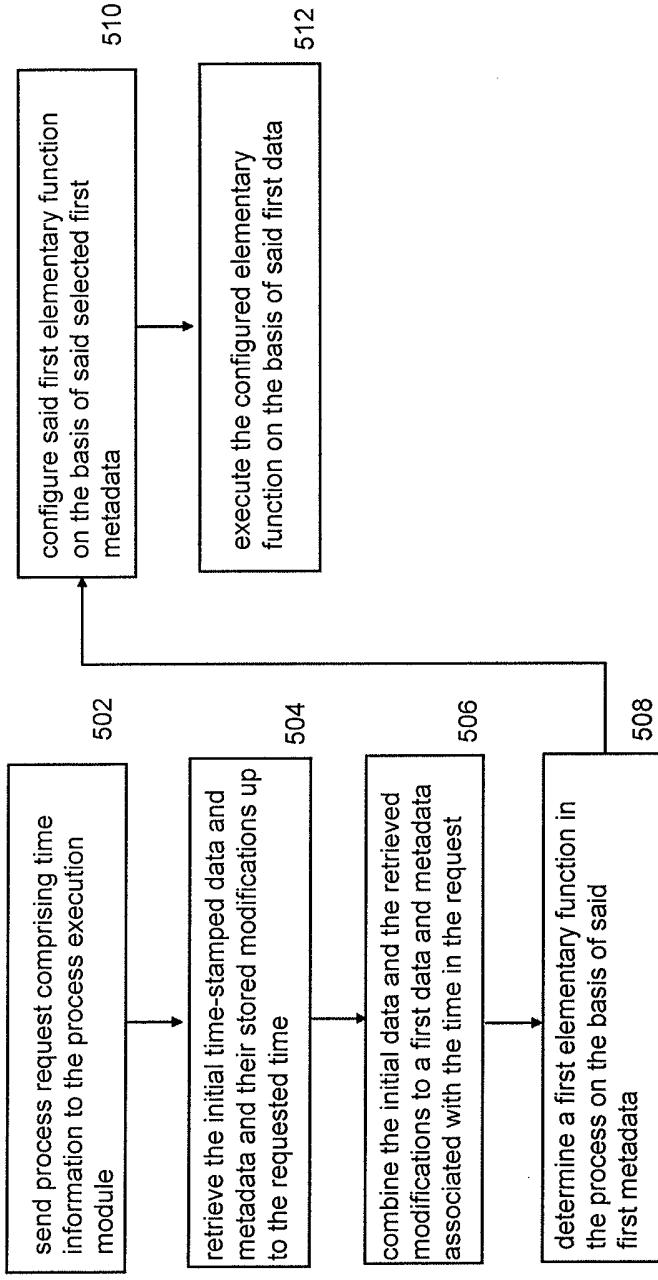


Figure 4

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Figure 5



ONDERZOEKSRAPPORT

BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

RELEVANTE LITERATUUR			
Categorie ¹	Literatuur met, voor zover nodig, aanduiding van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr.	Classificatie (IPC)
X	WO 2008/118594 A1 (MICROSOFT CORP [US]) 2 oktober 2008 (2008-10-02) * alinea [0021] - alinea [0049] *	1-14	INV. G06F9/44
A	US 2009/216786 A1 (AKIYAMA KAZUHITO [JP] ET AL) 27 augustus 2009 (2009-08-27) * alinea [0003] - alinea [0019], [0071]; figuur 3 *	1-14	
A	US 2006/031817 A1 (PIEPER FRIEDRICH [DE]) 9 februari 2006 (2006-02-09) * alinea [0029] - alinea [0033]; figuur 1 *	1-14	
A	US 2002/138449 A1 (KENDALL JOHN [US] ET AL) 26 september 2002 (2002-09-26) * alinea [0111] - alinea [0131]; figuur 7 *	1-14	
A	EP 1 818 813 A1 (RESEARCH IN MOTION LTD [CA]) 15 augustus 2007 (2007-08-15) * alinea [0036] - alinea [0040] *	1-14	Onderzochte gebieden van de techniek
A	EP 1 953 690 A2 (COGNOS INC [CA] IBM [US]) 6 augustus 2008 (2008-08-06) * alinea [0007] - alinea [0011] *	1-14	G06Q G06F
Indien gewijzigde conclusies zijn ingediend, heeft dit rapport betrekking op de conclusies ingediend op:			
Plaats van onderzoek: 's-Gravenhage		Datum waarop het onderzoek werd voltooid: 2 november 2011	Bevoegd ambtenaar: Bijn, Koen
¹ CATEGORIE VAN DE VERMELDE LITERATUUR			
<p>X: de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur</p> <p>Y: de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht</p> <p>A: niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft</p> <p>O: niet-schriftelijke stand van de techniek</p> <p>P: tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur</p>		<p>T: na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding</p> <p>E: eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven</p> <p>D: in de octrooiaanvraag vermeld</p> <p>L: om andere redenen vermelde literatuur</p> <p>&: lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie</p>	

**AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE
HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK,
UITGEVOERD IN DE OCTROOIAANVRAGE NR.**

NO 137877
NL 2007246

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaamde leden van dezelfde octrooifamilie), die overeenkomen met octrooischriften genoemd in het rapport.

De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per

De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door het Bureau voor de Industriële eigendom gegarandeerd; de gegevens worden verstrekt voor informatiedoeleinden.

02-11-2011

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
WO 2008118594 A1	02-10-2008	CN 101647013 A	10-02-2010
		EP 2140368 A1	06-01-2010
		JP 2010522932 A	08-07-2010
		US 2008244564 A1	02-10-2008
		WO 2008118594 A1	02-10-2008
US 2009216786 A1	27-08-2009	JP 2009199528 A	03-09-2009
		US 2009216786 A1	27-08-2009
US 2006031817 A1	09-02-2006	EP 1356380 A2	29-10-2003
		US 2004205690 A1	14-10-2004
		US 2006031817 A1	09-02-2006
		WO 02057910 A2	25-07-2002
US 2002138449 A1	26-09-2002	AU 2002247166 A1	08-10-2002
		CA 2442404 A1	03-10-2002
		EP 1371001 A2	17-12-2003
		US 2002138449 A1	26-09-2002
		WO 02077753 A2	03-10-2002
EP 1818813 A1	15-08-2007	CA 2576478 A1	02-08-2007
		EP 1818813 A1	15-08-2007
		US 2007198968 A1	23-08-2007
		US 2010138809 A1	03-06-2010
EP 1953690 A2	06-08-2008	CA 2576791 A1	31-07-2008
		EP 1953690 A2	06-08-2008
		US 2008183744 A1	31-07-2008



DOSSIER NUMMER NO137877	INDIENINGSDATUM 10.08.2011	VOORRANGSDATUM 10.08.2010	AANVRAAGNUMMER NL2007246
CLASSIFICATIE INV. G06F9/44			
AANVRAGER I&DT Holding B.V.			

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

- Onderdeel I Basis van de schriftelijke opinie
- Onderdeel II Voorrang
- Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
- Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding
- Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
- Onderdeel VI Andere geciteerde documenten
- Onderdeel VII Overige gebreken
- Onderdeel VIII Overige opmerkingen

	DE BEVOEGDE AMBTENAAR Bijn, Koen
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SCHRIFTELIJKE OPINIE

Aanvraag nr.:
NL2007246

Onderdeel I Basis van de Schriftelijke Opinie

1. Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.
2. Met betrekking tot **nucleotide en/of aminozuur sequenties** die genoemd worden in de aanvraag en relevant zijn voor de uitvinding zoals beschreven in de conclusies, is dit onderzoek gedaan op basis van:
 - a. type materiaal:
 - sequentie opsomming
 - tabel met betrekking tot de sequentie lijst
 - b. vorm van het materiaal:
 - op papier
 - in elektronische vorm
 - c. moment van indiening/aanlevering:
 - opgenomen in de aanvraag zoals ingediend
 - samen met de aanvraag elektronisch ingediend
 - later aangeleverd voor het onderzoek
3. In geval er meer dan één versie of kopie van een sequentie opsomming of tabel met betrekking op een sequentie is ingediend of aangeleverd, zijn de benodigde verklaringen ingediend dat de informatie in de latere of additionele kopieën identiek is aan de aanvraag zoals ingediend of niet meer informatie bevatten dan de aanvraag zoals oorspronkelijk werd ingediend.
4. Overige opmerkingen:

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The following document is referred to:

D1 ~ WO 2008/118594 A1 (MICROSOFT CORP. [US]) 2 October 2008

1 The present application does not meet the criteria of patentability, because the subject-matter of **claim 1** is not new.

Document **D1** discloses a computer-based metadata driven process control system (Setup and installation of operating systems and other complex computer applications) for use by at least one process-controlled organization, said system comprising:

- a plurality of metadata-configurable elementary functions ([0028] The setup modules 136 may be any type of executable, interpreted, or other file or function that performs an installation step) hosted on server system, each of said elementary functions comprising at least a data input ([0029] Each setup module 136 may be configured to be performed by receiving a data input. A data input may be useful in embodiments where an installation process is to be performed without a user interface), a data output (implicit - setup modules 136 are data processing modules) and a metadata input (implicit - follows from [0045]);
- at least one database (configuration file 110) for storing data ([0030] <...> The configuration file 110 may contain the data used by all of the setup modules 136 to perform the tasks of a setup process or installation) and metadata associated with said organization, said metadata comprising process metadata (sequence file 106) for identifying the elementary functions used in a process associated with said organization and for determining one or more sequences in which said elementary functions can be executed in said process ([0003] <...> The

installation process may be defined in a configuration file that includes metadata that defines the sequence of installation tasks as well as some error handling for various tasks // [0025] The sequence file 106 may define the specific steps and sequence of steps used to perform an installation or setup procedure) and configuration metadata for configuring the identified elementary functions in said process ([0030] Data gathered from the user interface modules 124 may be stored in the configuration file 110, which may be transferred to the setup modules 136. The configuration file 110 may contain the data used by all of the setup modules 136 to perform the tasks of a setup process or installation);

- a process control module (setup engine 102) hosted on said server system and configured to communicate with at least a first terminal and said database and to execute a process on the basis of a process execution request received from said terminal (implicit - refers to the party that request the installation to be performed); wherein said process control module is further configured
- to retrieve process metadata associated with said requested process for identifying elementary functions associated with said process and at least one execution sequence of said elementary functions ([0037] The setup engine 102 comprises a setup presenter 116 that may read the sequence file 106 and cause the various steps in an installation sequence to be performed. The setup presenter 116 may manage the installation steps by determining which steps are to be performed in which order, including determining if two or more steps may be performed in parallel or if two steps may be performed in sequence when dependencies exist between the steps // [0051] The process begins in block 202. The sequence file is read to determine a sequence of setup modules in block 204);
- to retrieve first configuration metadata for configuring a first elementary function associated with said process; to configure said first elementary function on the basis of said first configuration metadata; to

generate first output data by executing said first configured elementary function on the basis of said input data; and to retrieve second configuration metadata for configuring a second elementary function associated with said process on the basis of at least part of said output data ([0045] When the setup executor 132 calls one of the setup modules 136, configuration data 130 is read from the configuration file 110 for the module and the configuration data 134 is transferred to the setup module 136).

The subject-matter of **claim 1** is therefore not novel.

- 2 Method **claim 13** and computer program product **claim 14** correspond to system claim 1 and are therefore not novel either.

- 3 The dependent claims do not appear to contain any additional features which, in combination with the features of any claim on which they depend, could form the basis for a claim that involves an inventive step:
 - **claims 2-8** relate to keeping track of subsequent modifications to (meta)data by using time-stamps and to combining the initial (meta)data with subsequent modifications in order to obtain the current (meta)data; this is nothing more than applying the well known technique of version control/configuration management;
 - **claims 9, 10, 12** relate to obvious implementation details;
 - **claim 11** is disclosed in D1 (user interface modules 124). □