

(43) International Publication Date
30 December 2009 (30.12.2009)(10) International Publication Number
WO 2009/156136 A1(51) International Patent Classification:
G06F 17/30 (2006.01) **G06Q 10/00** (2006.01)(21) International Application Number:
PCT/EP2009/004548(22) International Filing Date:
24 June 2009 (24.06.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1099/KOL/2008 24 June 2008 (24.06.2008) IN(71) Applicant (for all designated States except US): **ABB TECHNOLOGY AG** [CH/CH]; Affolternstr. 44, CH-8050 Zürich (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SCHILLI, Bruno** [DE/DE]; Frühlingsweg 1/1, 69123 Heidelberg (DE). **SCHELLHAMMER, Wolfgang** [DE/DE]; Hauptstrasse 42, 69117 Heidelberg (DE).(74) Agents: **MILLER, Toivo et al.**; ABB AG, GF/IP, Postfach 1140, 68520 Ladenburg (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR AN AUTOMATED PREPARATION AND PUBLICATION OF INFORMATION OF TECHNICAL EQUIPMENT

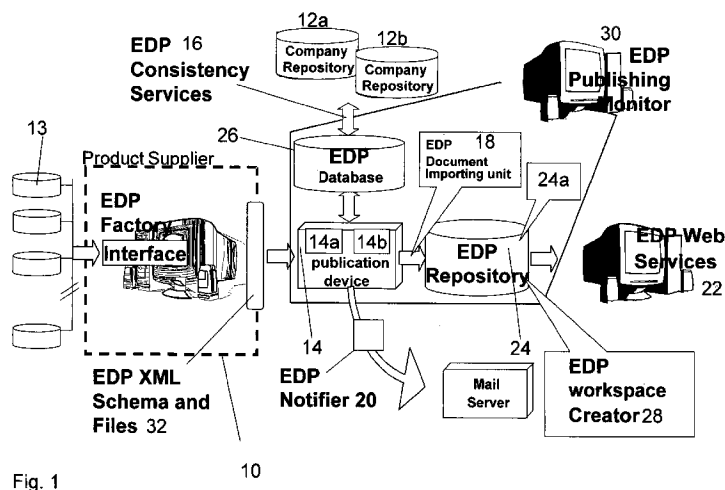


Fig. 1

(57) Abstract: The invention relates to a system for an automated preparation and publication of information of technical equipment comprises at least one interface and at least one data processing device cooperating and/or interacting with at least one storage device, whereas an allocation device (14a) for detecting and collecting digitally stored information and/or its related meta-data, especially in a distributed environment, and/or a publication device (14) for implementing and/or controlling and/or mapping and/or supervising the respective publishing process and whereas the publication device is interacting with the at least one interface for transferring the detected and/or collected information to the at least one storage device and for storing the respective data in an accessible digital form, especially in a generic data format. Furthermore, the system comprises access means for providing access to collected and/or stored data or information, and/or to establish at least one secure communication line for an exchange of data or information, and a monitoring device (30) for monitoring and/or displaying or rather presenting the whole publishing process. The invention also relates to a respective method to be executed on the above cited system.



— *before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of*

amendments (Rule 48.2(h))

System and method for an automated preparation and publication of information of
technical equipment

Description

The disclosure relates to a system and a method for an automated preparation and publication of information of technical equipment for the purpose of storing their contents as digital information in a repository, from where it is made available for third party as customers for example, especially for download, through various communication lines and links respectively, especially the internet, whereas at least one secure and reliable access to an individual product documentation and documents or information stored inside a corporate network from outside a corporate network is provided.

In basic concepts of Electronic Documentation Systems and related Electronic Documentation Programs (EDP), as disclosed in Proceedings of IDETC/CIE 2006, ASME 2006 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, September 10-13, 2006, Philadelphia, Pennsylvania, USA, DETC2006-99194 "MOVING PRODUCT INFORMATION ALONG THE VALUE CHAIN: OVERCOMING CHALLENGES OF DISTRIBUTED ORGANIZATIONAL STRUCTURE AND A HETEROGENEOUS INFORMATION ENVIRONMENT" by Harshavardhan Karandikar, Bruno Schilli, Wolfgang Schellhammer, Roar Karlsen, and as disclosed on the International Conference on Product Lifecycle Management, July 10 -12, 2006 in "Cost-effective Electronic Delivery of Product Data and Documentation" by Bruno Schilli, Wolfgang Schellhammer and Harsh Karandikar,, the sender of information publishes documents and meta-data into a specific file directory, which is supervised by so called EDP Publishing Services

using a procedure called Batch Conversion Service (BCS). The EDP Publishing Services collect, upload and transform the project specific documents and data into a repository, which consists of a database server and a file server. While project specific documents are copied to the file server of the EDP Repository, type specific documentation will remain in the central documentation library. Only references to that kind of documentation are managed in the database server of the EDP Repository. In order to inform the customer about a documentation delivery, EDP Publishing Services creates a notification to the receiver of the respective documentation, which contains a link to the relevant documentation set. Through this link the customer can access individual documents and properties of one delivery through a web interface.

Disadvantageously, in known systems the EDP Repository mainly consists of a managed and/or administrated individualized file system with limited access rights and functionality.

Furthermore, if information is available from more than one information source, there is no possibility provided to check consistency and/or quality of the available data. Accordingly, no synchronization of information is provided, so there may still remain a risk that the older and/or erroneous information is retrieved.

Starting from the described disadvantages, the invention is based on the object of providing a more efficient and/or more reliable possibility to collect and manage digital information, especially technical documentation from various sources, including their publication, presentation and/or distribution and as the case may be to provide a more efficient way to monitor the respective publishing process, especially from an operator perspective.

This object is achieved according to the invention through a system for automated preparation and publication of information of technical equipment with the features specified in claim 1. Advantageous developments and improvements of the system according to the invention, and a method for automated preparation and publication

of information, especially for executing the system, are given in further claims and in the description.

According to the invention the system for automated preparation and publication of information of technical equipment comprises at least one interface and at least one data processing device cooperating and/or interacting with at least one storage device, whereas

- an allocation device for detecting and collecting digitally stored information and/or its related meta-data, especially in a distributed environment, and/or
- a publication device for implementing and/or controlling and/or mapping and/or supervising the respective publishing process and whereas the publication device is interacting with the at least one interface for transferring the detected and/or collected information to the at least one storage device and for storing the respective data in an accessible digital form, especially in a generic data format,
- access means for providing access to collected and/or stored data or information, and/or to establish at least one secure communication line for an exchange of data or information,
- a monitoring device for monitoring and/or displaying or rather presenting the whole publishing process.

In one embodiment an assessment device for checking and/or evaluating the quality and/or consistency of the detected and/or collected information, in particular by means of reference data and/or pre-determinable rules is provided.

In one embodiment of the invention said access means comprise a notification device for notifying one or more predefined recipients according to an access to stored information, in particular a download of digitally stored information.

In a further embodiment said notification contains and/or provides a link comprising associated link parameters to ensure security and/or clearness and/or uniqueness of the link and/or the access.

Advantageously, in one embodiment the notification including the link may be generated automatically according to a request and/or the link parameters may be created or composed automatically by the notification device.

In one embodiment of the invention the access means comprise a notification device for notifying one or more predefined recipients according to an access to stored information, especially a download of digitally stored information, whereas a link is provided in the respective notification, comprising associated link parameters to ensure security and/or clearness and/or uniqueness of the link and/or the access,

In a further embodiment the automatic creation or generation of notification and/or link and/or link parameters may be triggered and/or initialized in cooperation of the publication and notification device, in case that information and/or date is stored in or at the at least one storage device.

In one embodiment the link parameters provided by the notification device are composed of automatically created GUID (Globally Unique Identifier), which may result from a transportation process within the company and/or a customer specific identification and/or order related identification and/or request related identification.

Furthermore, in another embodiment the notification device provides means to increase security for business critical documents by adding additional accounting parameters like user specific access name and/or related role in his company and/or personal company ID.

In such a case the related access information and/or password to access the respective account will be sent and delivered to third party, especially to customer, with encrypted separate mail and/or notification..

In one embodiment the notification device composes the link in the notification in such a way, that the receiver and/or addressee of the notification, especially the user, can copy it also into his internet browser and store as favorite link.

Furthermore, the notification device will keep the notification small in size.

The notification could be used to refer to customer documentation from any kind of computerized device, e.g. handheld PC, notebook or mobile, which enables services and customers to access any kind of documentation available in suppliers repository when dealing with product onsite and product installation.

In one further embodiment the notification is encrypted to avoid data sniffing by spyware and contains the necessary company disclaimers.

In a further embodiment of the invention the access means comprise at least one communication device which automatically creates a collaborative virtual room outside a companies firewall with links into a global repository or data storage respectively, beyond the firewall to provide a secure access to stored and/or collected information or data, especially to customers.

Furthermore, the communication device (eRoom Creator) performs or executes an automatic creation of virtual links, which is triggered by new data arriving in the repository. For each customer a virtual room may automatically be created with related user credentials.

It is assumed that the respective data storage and/or the global repository already contain documents, e.g. from a factory, which are automatically published into the repository.

In order to create secure customer access from outside a companies firewall and/or a secured network at least one of the following process steps are performed by the communication device and triggered through data, given by an identification file in a generic data format and/or Meta-data format, especially like a XML file:

- read metadata received from publishing tool and/or publication device, and/or
- automatically create a virtual meeting and communication room, e.g. an eRoom, associated with predefined users and groups, especially factory users and groups, and/or

- automatically create document links into repository and/or storage device in the created virtual meeting and communication room, e.g. an eRoom, and/or
- automatically create a service request for new customer users, respectively to check the validity of existing users, and/or
- receive approved customer user credentials from a global user management tool, and/or
- automatically create notification settings in virtual meeting and communication room and/or eRoom to allow automatic notification in case of changes, and/or
- automatically create individual encrypted notifications to customer users, containing links into virtual meeting and communication room and/or eRoom as well as pre-defined Company disclaimers and trademarks.

The above cited functionality may be implemented as a permanently running service, whereas having detected the trigger data the service runs the process till a predefined state is reached and/or reports back to the publication device as additional service.

In one embodiment the assessment device is prepared to check the quality of the data or information input especially from supplying factory, based on accessible and/or available reference data, especially stored on the data storage.

In one advantageous embodiment of the system a reference database is provided containing accessible reference data, which is automatically updated by services with verified distributed databases and information sources.

In another advantageous embodiment of the system a product and/or customer database is provided containing accessible technical product and/or customer specific information, which is automatically updated by services with verified distributed databases and information sources. Customer specific information may include firm name, address, contact persons, product range, special conditions and so forth.

In another embodiment of the invention a user management device is provided, which contains and/or stores and/or manages all necessary information regarding users and/or user groups and/or customers, like for example members, usernames, user profiles and/or identification files, but may also contain background information like fields of interest or search profiles or information profiles, and/or contact data and/or customer specific information like firm name, address, contact persons, product range, special conditions and so forth.

In another advantageous embodiment of the system an interface for providing access from the outside of a protective firewall into the storage device is provided.

In another advancement an administration device for managing availability of and/or access to accessibly stored digital information, in particular according to predetermined users and/or user profiles and/or user accounts, is provided.

In a further embodiment of the invention the notification device automatically creates a notification containing a link to customers, whereas the provided link is secure and reliable to provide customers access to an individual technical information and/or documentation of a product and/or technical equipment, for example from outside a corporate network to information and/or documents stored inside the corporate network of a product supplier.

In another embodiment of the invention a commercially available document management system may be included to import and store and manage technical information and /or documentation as well as its related descriptive data. The system according to the invention may comprise a module based structure with devices and units, wherein the units or devices respectively may be implemented on commercially available workflow management tools..

In an advantageous embodiment of the system according to the invention, at least one user interface (EDP Factory Interface) for at least one manufacturing factory is provided, which establishes a communication link to an enterprise and/or plant management system and facilitates a collection of specific delivery information in terms of automatically creating a data file with a mark-up information structure. The

specific delivery information may be provided as Meta-data in a generic data format, especially as XML-file, and therefore facilitates a respective user to upload and/or process the delivery specific documentation in an efficient and easy way, in particular with large flexibility and a plurality of different applications.

Furthermore, the user interface may be implemented either as a user driven form based user interface or as integral part of a local document management system, wherein in case of a form based implementation the user interface is provided as a web form, wherein when saving the form, the XML-file is created automatically and/or in the case the user interface is implemented as integral part of document management system, the necessary information/data is collected by means of a document management system and is automatically extracted as XML-file, together with the related information and/or documents and is triggered by user request.

In a further embodiment of the invention, the Meta-data for specific delivery information may also be obtained from an ERP (Enterprise Resource Planning)-System as an automated process. It also can be extended to be triggered from the ERP-system to start the publishing process.

At least one interface may be provided which units and/or links different factories or enterprises from different regions across globe and stream line the activity of the delivery process and/or publishing process.

In another embodiment of the invention the mark-up information is modelled/prepared as an XML-model, the so called EDP XML schema, which describes the publishing services and required data from supplying factories and which includes a Business Service Request (BSR) and a Business Data Object (BDO). The BSR may contain/include the notification device to notify publisher and customer. The BDO contains elements to describe delivery, product, related information and/or documents and related product properties. Instances of EDP XML Schema are EDP XML Files.

In an advantageous embodiment of the system according to the invention, the publication device is orchestrating the whole publishing process, which, in

cooperation and/or interaction with other system devices, in turn helps to define work flow sequence, quality checking of collected and/or received data and monitoring of process.

Furthermore, the publication device in cooperation with the allocation device may monitor the availability of information of technical equipment and/or the Meta-data and documentation in at least one pre-determinable location and/or move/bring detected information or rather information found into the publishing process.

In a preferred embodiment of the invention, based on the respective Meta-data the publication device generates a unique identifier for the process - the transaction GUID -, orchestrates the publishing process and invokes custom components to move the specific delivery documents, especially in a compressed file format, like the zip format, to a unique transaction folder with transaction GUID as folder name.

In an advantageous embodiment of the system according to the invention, the assessment device provides at least one consistency unit, which is implementing a service to guarantee synchronisation of data between different data repositories in at least one company.

Examples of potential repositories are CRM (Customer Relationship Management)-systems, containing data about suppliers, customers and factories, user management systems, document libraries, product classification systems and the like. A communication and/or information exchange with these repositories is implemented as services, requesting updates, new entries and transferring information into at least one provided storage device and/or a database (EDP Database) respectively.

In a further embodiment of the system according to the invention, at least one importing unit is provided, which, in cooperation with the at least one interface and the storage device, imports information and/or documentation into a first document repository (EDP Repository).

In one advancement the document importing unit is configurable and allows to configure and/or to specify one or more locations of documents and/or information to be fetched for import and/or to specify in which location in the first document repository (EDP Repository) the documents/information are stored and/or to specify failure location in case of failure in importing documents and/or to prepare import status in xml format for transaction and/or to specify the log option to be traced and/or to specify the log files to be deleted or retained. All this features may be running as one or more independent services.

In another advancement of the system according to the invention, the document importing unit uses a proprietary programmatically interface of the first document repository to create folder structures, copy files into and set access rights to information located in folders and files.

In a further embodiment of the system according to the invention, the first document repository (EDP repository) is provided by means of a commercially available Enterprise Content Management System (ECM), whereas for each delivery of a product a set of files is stored in the first document repository and/or the delivery sheet. Each set contains a unique identification, the documentation, the meta-data, the log file of transaction and suchlike.

Furthermore, the notification device creates a notification to the sender, who is publishing documentation to the customer, and potential receivers of the published documentation with a link into the first document repository.

The sender will always get a notification by default, even in case of errors to trace back the publication or rather the publishing process.

A receiver may be an electronic mail address and/or an IP address and/or a predefined device like a storage or processing device or any addressable device and/or unit of a distributed environment/system.

In an advantageous embodiment of the system according to the invention, the system comprises at least one web service, which provides a web interface for an internal / external customer/user to access their one or more specific delivery document. The service is built to download documentation based on a combination of user credentials and identifying parameters.

In an advantageous embodiment of the system according to the invention, the publication device comprises at least one workspace creator unit, which automatically creates customer specific collaboration workspace based on input received from the document publishing unit or document publication unit respectively.

Triggered by data from EDP XML File, the workspace creator unit may create an electronic and/or virtual meeting/working room, may create virtual links into the first document repository, may invoke creation of a set of managed users, and may create access control lists, based on received user credentials.

Furthermore, the workspace creator unit may set the adjustments to automatically create user notifications, when changes in the created collaboration workspace will happen. The workspace creator unit may be running as a permanent service on the first document repository (EDP Repository).

In a further embodiment of the system, at least one web service is provided, which uses single sign on functionality to control user access and structures created by the workspace creator on top of the first document repository.

In an advantageous embodiment of the system according to the invention, the monitoring device comprises a web based monitoring tool, which allows the administrators to monitor the system behaviour and to make adjustments and/or amendments in system components and/or set up and or tools.

The monitoring device and/or monitoring tool may display the status of each publishing process and give links onto published information and/or documentation on at least one information and/or document repository, in particular the first document repository.

In an advantageous embodiment of the system according to the invention, at least one storage device with at least one relational database and/or a set of relational database tables describing the necessary data for managing the system for automated preparation and publication of information of technical equipment is provided.

Through the monitoring device administrators and as the case may be authorized operators are able to change basic data and/or information in a respective database on the storage device.

As a part of the publication process in cooperation with the assessment device the publication unit may invoke at least one quality check of received information to check the consistency of the collected and/or received information with stored information in at least one reference or information database respectively, which itself is made consistent with at least one company repository by consistency services. If the quality check, after a consistency check, reports consistency of data or information respectively, it may generate one or more delivery sheets and/or logs, and/or extend the Meta-data file with transaction specific information and start the publishing process into first information and/or document repository.

In one embodiment of the invention the publishing or publication process may be triggered and/or initiated by request.

The delivery sheet, delivery documents, Meta data set and extended Meta data set are set ready to be imported by the document importing unit (EDP Document Importer).

The document importing unit creates a status file in structured format, especially in xml format, with GUID as a file name. During publishing process the publication unit will read the status file, based on the information and will invoke the notification unit and web services, if status of the document importer reports successful download into the first document repository.

Furthermore, the aforesaid object also is achieved according to the invention through a method for automated preparation and publication of information of technical equipment, which may be executed on a cited system for automated preparation and publication of information of technical equipment.

The method according to the invention, with which the object is further achieved, for automated preparation and publication of information of technical equipment comprises

- detecting and collecting digitally stored information and/or its related meta-data, in particular in a distributed environment from various sources, and/or
- transferring the detected and/or collected information to at least one storage device and storing the respective data in an accessible digital form, especially in a generic data format,
- managing availability of and/or access to accessibly stored digital information, especially according to predefined users and/or user profiles and/or user accounts, and/or,
- providing access to collected and/or stored data or information, and/or to establishing at least one secure communication line for an exchange of data or information, and/or
- monitoring and/or displaying the whole publishing process.

In one embodiment of the invention access may be granted and/or a communication line may be established by notifying one or more predefined recipients according to an access to stored information, especially a download of digitally stored information.

In a further embodiment a link is provided in the respective notification, comprising associated link parameters to ensure security and/or clearness and/or uniqueness of the link and/or the access.

Advantageously, in one embodiment the link may be generated automatically or by request and/or the link parameters may be created or composed automatically.

In a further embodiment the automatic creation or generation of notification and/or link and/or link parameters may be triggered and/or initialized in case that information and/or data is stored in or at the at least one storage device.

In one embodiment the link parameters are composed of automatically created GUID (Globally Unique Identifier), which may result from a transportation process within the company and/or a customer specific identification and/or order related identification and/or request related identification.

Furthermore, in another embodiment security for business critical documents may be increased by adding additional accounting parameters like user specific access name and/or related role in his company and/or personal company ID.

In such a case the related access information and/or password to access the respective account will be sent and delivered to third party, especially to customer, with encrypted separate mail and/or notification..

In one embodiment the link in the notification will be composed and/or created in such a way, that the receiver and/or addressee of the notification, especially the user, can copy it also into his internet browser and store it as favourite link.

Furthermore, the notification will be kept small in size.

The notification could be used to refer to customer documentation from any kind of computerized device, e.g. handheld PC, notebook or mobile, which enables services and customers to access any kind of documentation available in suppliers repository when dealing with product onsite an product installation.

In one further embodiment the notification is encrypted to avoid data sniffing by spyware and/or contains the necessary company disclaimers.

In a further embodiment of the invention access to collected and/or stored data or information, and/or at least one secure communication line are provided and/or established by automatically creating a collaborative virtual room outside a companies firewall with links into a global repository or data storage respectively, beyond the firewall to provide a secure access to stored and/or collected information or data, especially to customers.

Furthermore, an automatic creation of virtual links is performed and/or executed and/or triggered by new data arriving in the repository and/or the data storage. For each customer a virtual room may automatically created with related user credentials.

It is assumed that the respective data storage and/or the global repository already contain documents, e.g. from a factory, which are automatically published into the repository.

Advantageously, In order to create secure customer access from outside a companies firewall and/or a secured network at least one of the following process

steps are performed and/or triggered through data, given by an identification file in a generic data format and/or Meta-data format, especially like a XML file:

- read metadata received from a publishing tool and/or a publication device, and/or
- automatically create a virtual meeting and communication room, e.g. an eRoom, associated with predefined users and groups, especially factory users and groups, and/or
- automatically create document links into repository and/or storage device in the created virtual meeting and communication room, e.g. an eRoom, and/or
- automatically create a service request for new customer users, respectively to check the validity of existing users, and/or
- receive approved customer user credentials from a global user management tool, and/or
- automatically create notification settings in eRoom to allow automatic notification in case of changes, and/or
- automatically create individual encrypted notifications to customer users, containing links into eRoom as well as pre-defined Company disclaimers and trademarks.

The above cited functionality may be implemented as a permanently running service, whereas having detected the trigger data the service runs the process till a predefined state is reached and/or reports back to the publication device as additional service.

In one embodiment of the invention the detection and/or collection and /or check and/or transfer of stored information and/or its related meta-data is executed automatically and/or cyclically or continuously and may be once initiated by request.

In one embodiment a check and/or evaluation of the quality and/or consistency of the detected and/or collected data, in particular by means of reference data and/or pre-determinable rules, is performed.

In one embodiment of the method a check of the quality of the data or information input, in particular from supplying factory, based on accessible and/or available reference data, is being performed.

In one advantageous embodiment of the method a reference database is provided containing accessible reference data, which database is automatically updated by services with verified distributed databases and information sources.

In another advantageous embodiment of the method access from the outside of a protective firewall into the storage device is provided and/or granted.

In a further embodiment of the invention notification containing a link to customers are automatically created, whereas the provided link is secure and reliable to provide for customers access to an individual technical information and/or documentation of a product and/or technical equipment, for example from outside a corporate network to information and/or documents stored inside the corporate network of a product supplier.

In another embodiment of the method a collaborative virtual room outside a companies firewall with links into a global document repository beyond the firewall is automatically created to provide a secure access to customers.

In another embodiment of the invention a commercially available document management system may be included to import and store and manage technical information and /or documentation as well as its related descriptive data.

In an advantageous embodiment a communication link to an enterprise and/or plant management system may be established, which facilitates a collection of specific delivery information in terms of automatically creating a data file with a mark-up information structure.

The specific delivery information may be provided as Meta-data in a generic data format, especially as XML-file, and therefore facilitates a respective user to upload

and/or process the delivery specific documentation in an efficient and easy way, especially with large flexibility and a plurality of different applications.

Furthermore, the interface may be implemented either as a user driven form based user interface or as integral part of a local document management system, wherein in case of a form based implementation the user interface is provided as a web form, wherein when saving the form, the XML-file is created automatically and/or in the case the interface is implemented as integral part of document management system, the necessary data is collected by means of a document management system and is automatically extracted as XML-file, together with the related information and/or documents and is triggered by user request.

In a further embodiment of the invention, the Meta-data for specific delivery information may also be obtained from an ERP (Enterprise Resource Planning)-System as an automated process.

It also can be extended to be triggered from the ERP-system to start the publishing process.

By use of at least one interface to an enterprise and/or plant management system different factories or enterprises from different regions across globe are united and/or linked and the activity of the delivery process and/or publishing process is streamlined.

In another embodiment of the invention the mark-up information is modelled/prepared as an XML-model, the so called EDP XML schema, which describes the publishing services and required data from supplying factories and which includes a Business Service Request (BSR) and a Business Data Object (BDO).

In another advantageous embodiment the publishing process is orchestrated in cooperation and/or interaction with different system devices, in turn helps to define work flow sequence, quality checking of collected and/or received data and monitoring of process.

In another embodiment a check and/or evaluation of the quality and/or the consistency of the detected and/or collected data, in particular by means of reference data and/or pre-determinable rules is being performed and/or executed.

Furthermore, the availability of information of technical equipment and/or the Meta-data and documentation in at least one pre-determinable location may be monitored and information found according to the publishing process may be moved.

In another advancement of the invention based on the respective Meta-data a unique identifier for the process is being generated, the transaction GUID, the publishing process is orchestrated and custom components are invoked to move the specific delivery documents, especially in a compressed file format, like the zip format, to a unique transaction folder with transaction GUID as folder name.

In an advantageous embodiment of the method according to the invention, a synchronisation of data between different data repositories in at least one company is implemented and/or performed.

In a further embodiment of the method according to the invention, information and/or documentation is imported into a first document repository (EDP Repository).

The importing process is configurable and allows to configure and/or to specify one or more locations of documents and/or information to be fetched for import, to specify in which location in first document repository (EDP Repository) the documents/information is stored and/or to specify failure location in case of failure in importing documents and/or to prepare import status in xml format for transaction and/or to specify the log option to be traced and/or to specify the log files to be deleted or retained.

In an advantageous embodiment of the invention the proprietary programmatical interface of the first document repository is being used to create folder structures, copy files into and set access rights to information located in folders and files.

Furthermore, a notification to the sender and potential receivers with a link into the first document repository may be created automatically.

The sender will always get a notification by default, even in case of errors to trace back the publishing process.

A receiver may be an electronic mail address, an IP address, a predefined device like a storage or processing device or any addressable device and/or unit of a distributed environment/system.

In an advantageous embodiment of the invention customer specific collaboration workspace may automatically be created, in particular outside a companies firewall, based on input received from the document publishing process. Triggered by data from EDP XML File an electronic and/or virtual meeting/working room, virtual links into the first document repository may be created and a creation of a set of managed users, access control lists, based on received user credentials, may be invoked and/or created.

Furthermore, adjustments may be set to automatically create user notifications, when changes in the created collaboration workspace will happen.

In a further embodiment of the method, single sign on functionality to control user access and structures are used.

In another embodiment of the invention all necessary information regarding users and/or user groups and/or customers, like for example members, usernames, user profiles and/or identification files, but may also contain background information like fields of interest or search profiles or information profiles, and/or contact data and/or customer specific information like firm name, address, contact persons, product range, special conditions and so forth are provided and/or stored and/or managed, especially by use of a user management device.

In an advantageous embodiment of the method according to the invention, administrators may monitor the system behaviour and make adjustments and/or amendments in system components and/or set up and or tools.

The monitoring device and/or monitoring tool may display the status of each publishing process and give links onto published information and/or documentation on at least one first information and/or document repository.

In an advantageous embodiment of the system according to the invention, at least one storage device with at least one relational database and/or a set of relational database tables describing the necessary data for managing the system for automatic preparation and publication of information of technical equipment is provided.

In another advancement authorized operators are able to change basic data and/or information in an EDP Database, in particular a reference and/or a customer and/or a product database with specific information.

In another preferred embodiment of the invention a quality check of received information and/or a consistency check of collected and/or received information with stored information in reference database is performed. If the quality check, after a consistency check, reports consistency of data or information respectively, it may generate one or more delivery sheets, logs, and/or extend the Meta-data file with transaction specific information and start the publishing process.

The delivery sheet, delivery documents, Meta data set and extended Meta data set are set ready to be imported.

Furthermore, a status file in structured format, especially in xml format, with GUID as a file name may be created. During publishing process the status file will be read, based on the information, notification will be generated and transmitted if successful download into the first document repository is being reported.

Further advantageous embodiments of the system and the respective method according to the invention are disclosed in reference to the examples according to Fig. 1 and Fig. 2.

Fig. 1 shows an exemplary system according to the invention to run or execute a method for an automated preparation and publication of information of technical equipment.

Fig. 2 shows an exemplary system according to the invention to run or execute a method for an automated preparation and publication of information of technical equipment including access means for providing access to collected and/or stored data or information, and/or to establish at least one secure communication line for an exchange of data or information.

A system for an automated preparation and publication of information of technical equipment includes a module like structure comprising several module based devices and/or devices or rather units. A data processing device cooperating with at least one storage device is provided, wherein the module based devices and/or units comprise means for detecting and collecting digitally stored information, especially documents, and/or its related meta-data, especially in a distributed environment, and/or for checking the quality of collected data, for transferring the detected and/or collected information to the at least one storage device and/or for storing the respective data in digital form in a first information and/or document repository, is disclosed in Fig. 1.

Furthermore, system devices and/or units are provided for managing availability and/or access of information, especially concerning users and/or user profiles and/or user accounts, and/or for providing access from the outside of a protective firewall into the storage device, and for notifying one or more predefined recipients of an access to stored information, especially a download of stored information.

Accordingly this system is prepared to execute or carry out a method for an automated preparation and publication of information of technical equipment, wherein

digitally stored information, especially documents, and/or its related meta-data, are detected and collected according to assigned locations/sources, especially in a distributed environment, and/or the quality of the collected data and/or information is checked, especially by predefined functionalities and/or services of a reference database (26), which may deliver reference data to be compared with actual information collected, after checking detected and/or collected information is transferred to at least one storage device and/or is being stored in digital form in a first document repository (24), stored information and/or data are made selectively accessible and available for assigned users according to their respective user profile and/or user account, especially from the outside of a protective firewall into the storage device, and/or one or more assigned recipients are being notified of an access to stored information, especially a download of stored information.

According to the invention an exemplary system for an automated preparation and publication of information of technical equipment is shown in Fig. 1. The system facilitates the preparation and publication of digital documentation based on digital information and/or data from various sources and locations into a first document repository 24, from where it is selectively available for assigned users according to their accounts and/or user profiles. The exemplary system has a module like structure and includes an allocation device 14a which detects released, digitally stored documents and its related meta-data in a distributed environment, in particular of a globally distributed company, an assessment device 14b which checks the quality and/or consistency of given data, a first interface which transports the detected files into a storage device with information and/or first document repository 24 for digital data and stores the respective data in digital form, an administration device 24a which manages availability and/or access of information, in particular concerning users and/or user profiles and/or user accounts, a second interface, which provides access from outside the companies protective firewall into the digital storage and information and/or first document repository 24, and a notification device 20 which notifies one or more predefined recipients, especially a customer and/or user, according to an access to and/or delivery of published information or documentation.

The devices and/or units may also be implemented on commercially available workflow management tools.

According to the system embodiment disclosed in Fig. 1 it is assumed that the origin of documents is worldwide distributed within the network of a company and that this network is protected by firewalls against attack from outside. Nevertheless the customer will be given access to his documentation exclusively through publishing into a collaborative platform, like eRoom from EMC/Documentum.

The system includes a user interface (EDP Factory Interface) 10, which, for an authorized user and/or operator, provides selective access to a number of predetermined factories and/or factory automation machinery and/or power plant which are producing products for customers. The user interface 10 facilitates to detect and selectively collect specific delivery information, called as Meta-data, from various sources 12a, 12b, 13 and locations. The user interface comprises a work flow functionality, which creates the required Meta-data for the electronic publishing process as an XML file, which follows a specific XML schema (EDP XML schema), and facilitates an assigned user to upload the delivery specific documentation. By creation of the XML-file, the user interface 10 facilitates the work flow for the business process behind the scene.

The user interface (EDP Factory Interface) 10 may be implemented either as a user driven form based user interface or as integral part of a local document management system. In case of form based implementation, the user interface is provided as a web form or excel form, when saving the form, the XML file 32 is created automatically. In case of integral part of document management system, the necessary data is collected in document management system and automatically extracted as XML file 32, together with the related documents, triggered by a user button and/or request. The Meta-data for the delivery contains information about the customer and/or the product and/or its related documentation and the product properties. Meta-data also can be obtained from an ERP (Enterprise Resource Planning) System as an automated process. It also can be extended to be triggered from the ERP system to start the respective publishing process. The user interface (EDP Factory Interface) 10 enables a common publishing process in different factories and/or enterprises from different regions across globe and streamlines the activity of the delivery process.

The specific XML schema (EDP XML schema) and/or XML model 32 describe the publishing services and required data from supplying factories. It comprises a Busi-

ness Service Request (BSR) and a Business Data Object (BDO). The BSR contains a notification unit to notify the publisher and customer. The BDO does contain at least one descriptive unit to describe the delivery, the product, the related documents and the related product properties. Instances of the specific XML schema are EDP XML files 32.

Furthermore the publication device (EDP Publisher) 14 is provided as a tool, which is orchestrating the publishing process and helps/supports to define flow sequence, quality checking of received data and monitoring of process. The publication unit 14 will monitor the availability of the Meta-data and documentation in at least one defined location. Based on the Meta-data the publication device 14 generates a unique identifier for the process, the transaction GUID (Globally Unique Identifier), orchestrates the publishing process and invokes custom components to move the specific delivery documents, especially in compressed format like ZIP, to a unique transaction folder with transaction GUID as folder name. As a part of publishing process it will invoke the assessment device 14b, whereas a quality check of retrieved information/data and given and/or collected information is performed permanently or periodically and said information /data is compared with reference data in a reference database 26 on a storage device, and whereas a permanently or periodically running consistency check including EDP consistence services 16 is performed. If the assessment device 14b reports consistency of data, it will generate a delivery sheet, Logs, and Extend the Meta-data file with transaction specific information. If it reports inconsistency, the publishing process is aborted, whereas an error process is started with appropriate roll-back in database (26), with logging the error, with informing the monitoring device (30) and with sending a notification (20) by mail to the sender, who is publishing the documentation. The delivery sheet, delivery documents, Meta and extended Meta data are set ready to get imported by a document importing unit (EDP Document Importer) 18. The document importing unit 18 will create a status file (xml format) with GUID as a file name. During publishing process the publication device will readout the status file, based on transaction specific information and will invoke the notification unit (EDP Notifier) of the notification device 20 and WebServices 22, if status of document importing unit 18 reports successful download into a first document repository (EDP Repository) 24.

Assessment device 14b as well as consistency services 16 are implementing a service to guarantee synchronization of data between different data repositories 12a, 12b in one company. Examples of potential repositories are CRM (customer relationship management)-systems, containing data about suppliers, customers and factories, user management systems, document libraries, the product classification system. The communication with these repositories 13, 12a, 12b is implemented as services, requesting updates, new entries and transferring data into at least one database 26.

The document importing unit 18 includes a tool to import documentation into the first document repository 24. It is a configurable tool, which has an option to configure, to specify location of the documents to be fetched for import, to specify failure location in case of failure in importing documents, preparing import status in xml format for transaction, to specify the log option to be traced and to specify the log files to be deleted or retained. All this features will be running as one or more independent services.

The document importing unit 18 and especially its tool is using the proprietary grammatical interface of the first document repository 24 to create folder structures, copy files into and set access rights to folders and files.

The first document repository (EDP Repository) 24 may be a commercially available Enterprise Content Management System (ECM). For each delivery of a product a set of files may be stored. Each set contains a unique identification, the documentation, the meta-data, the log file of transaction into the repository and the delivery sheet.

The notification device 20 and/or notification unit (EDP Notifier) respectively create a notification to the originator of the publishing process (sender) and to potential or assigned receivers respectively with a link into the first document repository 24.

Furthermore, a web services 22 as an interface for an internal / external customer to access their specific delivery document are provided. The respective service is built to download documentation based on a combination of user credentials and identifying parameters. The web services 22 use single sign on, to control user access and structures created by an collaborative platform and/or workspace creator 28, on top of the first document repository 24 (EDP Repository).

Additionally a monitoring device (EDP Publishing Monitor) 30 is provided and built as a web based application, which allows the system administrators and/or authorized users to monitor the system behavior and make adjustments in several system modules, units, elements or tools. It displays the status of each publishing process and gives links referring to published documentation. Through EDP Publishing Monitor administrators are able to change basic data in the reference database 26.

A set of relational database tables 26 (EDP Database) describing the necessary data for managing and/or monitoring the system as well as the respective method for an automated preparation and publication of information of technical equipment is provided.

The collaborative platform or workspace creator unit (EDP Workspace Creator) 28 will create customer specific communication zones, like eRooms, automatically based on input received from the document publication unit 14. Triggered by data from the XML schema and the respective XML file 32, it will create the specific workspace, create virtual links into the first document repository 24, invoke creation of a set of managed users, and create access control lists, based on received user credentials. Finally it will set the adjustments to automatically create user notifications, when changes in the created electronic workspace will happen. The collaborative platform or workspace creator 28 is running as permanent service on the first document repository (EDP Repository). 24.

In Fig. 2 a system for an automated preparation and publication of information of technical equipment comprises at least one interface and at least one data processing device cooperating and/or interacting with at least one storage device, whereas an allocation device 14a for detecting and collecting digitally stored information and/or its related meta-data, especially in a distributed environment, and/or a publication device 14 for implementing and/or controlling and/or mapping and/or supervising the respective publishing process and whereas the publication device is interacting with the at least one interface for transferring the detected and/or collected information to the at least one storage device and for storing the respective data in an accessible digital form, especially in a generic data format, and access means for pro-

viding access to collected and/or stored data or information, and/or to establish at least one secure communication line for an exchange of data or information, and/or

- a monitoring device (30) for monitoring and/or displaying or rather presenting the whole publishing process.

As part of the access means at least one communication device 34 is provided which automatically creates a collaborative virtual room 35 outside a companies firewall with links into a global repository or data storage respectively, beyond the firewall to provide a secure access to stored and/or collected information or data, especially to customers.

Furthermore, the communication device 34 performs or executes an automatic creation of virtual links, which is triggered by new data arriving in the repository. For each customer a virtual room may automatically be created with related user credentials.

It is assumed that the respective data storage and/or the global repository already contain documents, e.g. from a factory, which are automatically published into the repository.

In order to create secure customer access from outside a companies firewall and/or a secured network at least one of the following process steps are performed by the communication device and triggered through data, given by an identification file in a generic data format and/or Meta-data format, especially like a XML file:

- read metadata received from publishing tool and/or publication device, and/or
- automatically create a virtual meeting and communication room 35, e.g. an eRoom, associated with predefined users and groups, especially factory users and groups, and/or
- automatically create document links into repository and/or storage device in the created virtual meeting and communication room, e.g. an eRoom, and/or
- automatically create a service request for new customer users, respectively to check the validity of existing users, and/or

- receive approved customer user credentials from a global user management device 36 or user management tool, and/or
- automatically create notification settings in virtual meeting and communication room 35 and/or eRoom to allow automatic notification in case of changes, and/or
- automatically create individual encrypted notifications 38 to customer users, containing links into virtual meeting and communication room and/or eRoom as well as pre-defined Company disclaimers and trademarks.

The user management device 36 may contain and/or store and manage respectively all necessary information regarding users and/or user groups, for example like members, usernames, user profiles and/or identification files, but may also contain background information like fields of interest or search profiles or information profiles, and/or contact data.

The above cited functionality may be implemented as a permanently running service, whereas having detected the trigger data the service runs the process till a predefined state is reached and/or reports back to the publication device as additional service.

The specification and drawings are, accordingly, to be regarded in an illustrative rather than in a restrictive sense. It will, however, be evident that various modifications and changes may be made thereunto without departing from the broader spirit and scope of the invention as set forth in the claims.

Claims

1. System for automated preparation and publication of information of technical equipment comprises at least one interface and at least one data processing device cooperating and/or interacting with at least one storage device, whereas
 - an allocation device (14a) for detecting and collecting digitally stored information and/or its related meta-data, especially in a distributed environment, and/or
 - a publication device (14) for implementing and/or controlling and/or mapping and/or supervising the respective publishing process and whereas the publication device is interacting with the at least one interface for transferring the detected and/or collected information to the at least one storage device and for storing the respective data in an accessible digital form, especially in a generic data format,
 - access means for providing access to collected and/or stored data or information, and/or to establish at least one secure communication line for an exchange of data or information, and/or
 - a monitoring device (30) for monitoring and/or displaying or rather presenting the whole publishing process.

2. System according to claim 1, characterized in that a module based structure is provided, which includes at least one interface (10), a consistency unit (16), a document importing unit (18), a notification unit, a first document repository (24), a web service (22), a collaborative platform creator unit (28), a monitoring device (30) and at least one database (26).
3. System according to claim 1 or claim 2, characterized in that at least one user interface (10) is provided for at least one enterprise and/or manufacturing factory, which establishes a communication link to an enterprise and/or plant management system and accordingly facilitates a collection of specific delivery information.
4. System according to claim 3, characterized in that, the specific delivery information is provided as Meta- data in a generic data format according to a given information model, especially as XML-model and/or –schema (32), and therefore facilitates a respective user to upload the delivery specific documentation.
5. System according to one of claim 2 to claim 5, characterized in that the user interface (10) may be implemented either as a user driven form based user interface or as integral part of a local document management system, wherein in the case of a user driven form the user interface is provided as a web form or excel form and/or when saving the form a XML file (32) is created automatically or in the case the interface is implemented as integral part of a document management system, the necessary data may be collected by means of a document management system and/or is automatically extracted as XML file, especially together with the related information and/or documents and/or may be triggered by user request.
6. System according to one of the preceding claims, characterized in that at least one interface (10) is provided, which units and/or links different factories or enterprises from different regions across globe and stream line the activity of the delivery process.

7. System according to one of the preceding claims, characterized in that an XML schema 32 is provided comprising an XML model, wherein the model describes the publishing services and the required data from supplying factories and/or wherein the model includes a business service request and a business data object, wherein the business service request includes a notification unit to notify publisher and customer and/or the business data object include elements to describe delivery, product related information and/or documents and related product properties.
8. System according to one of the preceding claims, characterized in that the publication device (14) implements and/or controls and/or maps and/or monitors the publication or rather the publishing process and/or monitors the availability of information of technical equipment and/or Meta-data and/or documentation in one or more assignable locations.
9. System according to claim 8, characterized in that according to the Meta-data the publication device (14) generates a unique identifier for the process, the transaction GUID, orchestrates, maps, monitors the business process and invokes custom components to move the specific delivery documents, especially in a compressed file format, to a unique transaction folder with transaction GUID as folder name.
10. System according to one of the preceding claims, characterized in that at least one consistency unit (16) is provided, which implements a service to synchronise data and/or information between different data repositories (12a, 12b) and/or databases and/or locations in one or more enterprises.
11. System according to one of the preceding claims, characterized in that at least one document importing unit (18) is included, which provides means to import information and/or documentation into a first document repository (24), and/or wherein said document importing unit (18) is configurable and allows to configure and/or to specify one or more locations of documents and/or information to be fetched for import and/or to specify failure location in case of failure in importing documents and/or preparing import status in XML format for transaction and/or to specify the log option to be traced and/or to specify the log files to be deleted or retained.

12. System according to one of the preceding claims, characterized in that at least a notification unit (20) is provided, which creates a notification to potential information and/or document receivers with a link into a first document repository (24).
13. System according to one of the preceding claims that at least one web service (22) is provided, which includes a web interface for an internal / external customer/user to access their one or more specific delivery document, whereas the service is built to download documentation based on a combination of user credentials and identifying parameters.
14. System according to one of the preceding claims, characterized in that at least one collaborative platform or rather workspace creator unit (28) is included, which creates customer specific communication zones, especially web based ones, automatically based on input received from the publication device (14) to exchange and/or share information and/or data.
15. System according to one of the preceding claims, characterized in that at least one monitoring device (30) comprising a monitoring tool is provided, wherein the monitoring tool is built as a web based tool, which allows one or more authorized persons, especially the administrator, to monitor the system behaviour and/or to make adjustments and/or amendments in system components and/or tools.
16. System according to one of the preceding claims, characterized in that at least one storage device with at least one relational database and/or a set of relational database tables (26) describing the necessary data for managing the system for automatic preparation and publication of information of technical equipment.
17. System according to one of the preceding claims, characterized in that a notification device (20) is provided for notifying one or more predefined recipients according to an access to stored information, in particular a download of digitally stored information and/or a link is provided in the respective notification, comprising associated link parameters to ensure security and/or clearness and/or uniqueness of the link and/or the access.

18. System according to one of the preceding claims , characterized in that at least one communication device is provided, which automatically creates a collaborative virtual room .

19. System according to claim 18, characterized in that the collaborative virtual room is created outside a companies firewall with links into a global repository or data storage respectively, beyond the firewall to provide a secure access to stored and/or collected information or data, especially to customers.

20. Method for automated preparation and publication of information of technical equipment comprising

- detecting and collecting digitally stored information and/or its related meta-data, in particular in a distributed environment from various sources (13,12a,12b), and/or
- transferring the detected and/or collected information to at least one storage device and storing the respective data in an accessible digital form, especially in a generic data format,
- managing availability of and/or access to accessibly stored digital information, especially according to predefined users and/or user profiles and/or user accounts, and/or,
- providing access to collected and/or stored data or information, and/or establishing at least one secure communication line for an exchange of data or information, and/or
- monitoring and/or displaying the whole publishing process.

21. Method according to claim 20, characterized in that, one or more predefined recipients are notified according to an access to stored information, especially a download of digitally stored information, whereas a link is provided in the respective notification, comprising associated link parameters to ensure security and/or clearness and/or uniqueness of the link and/or the access.

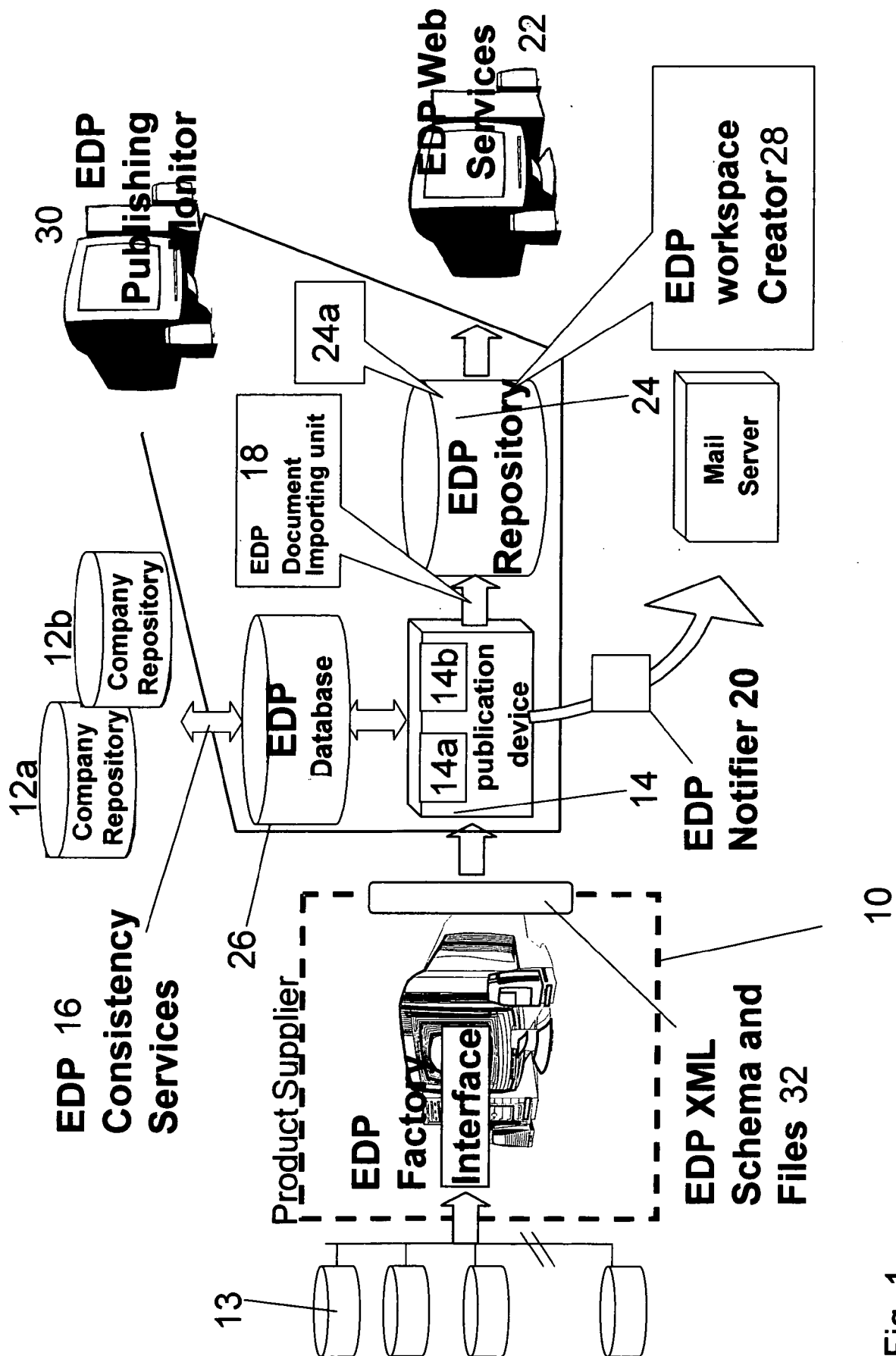
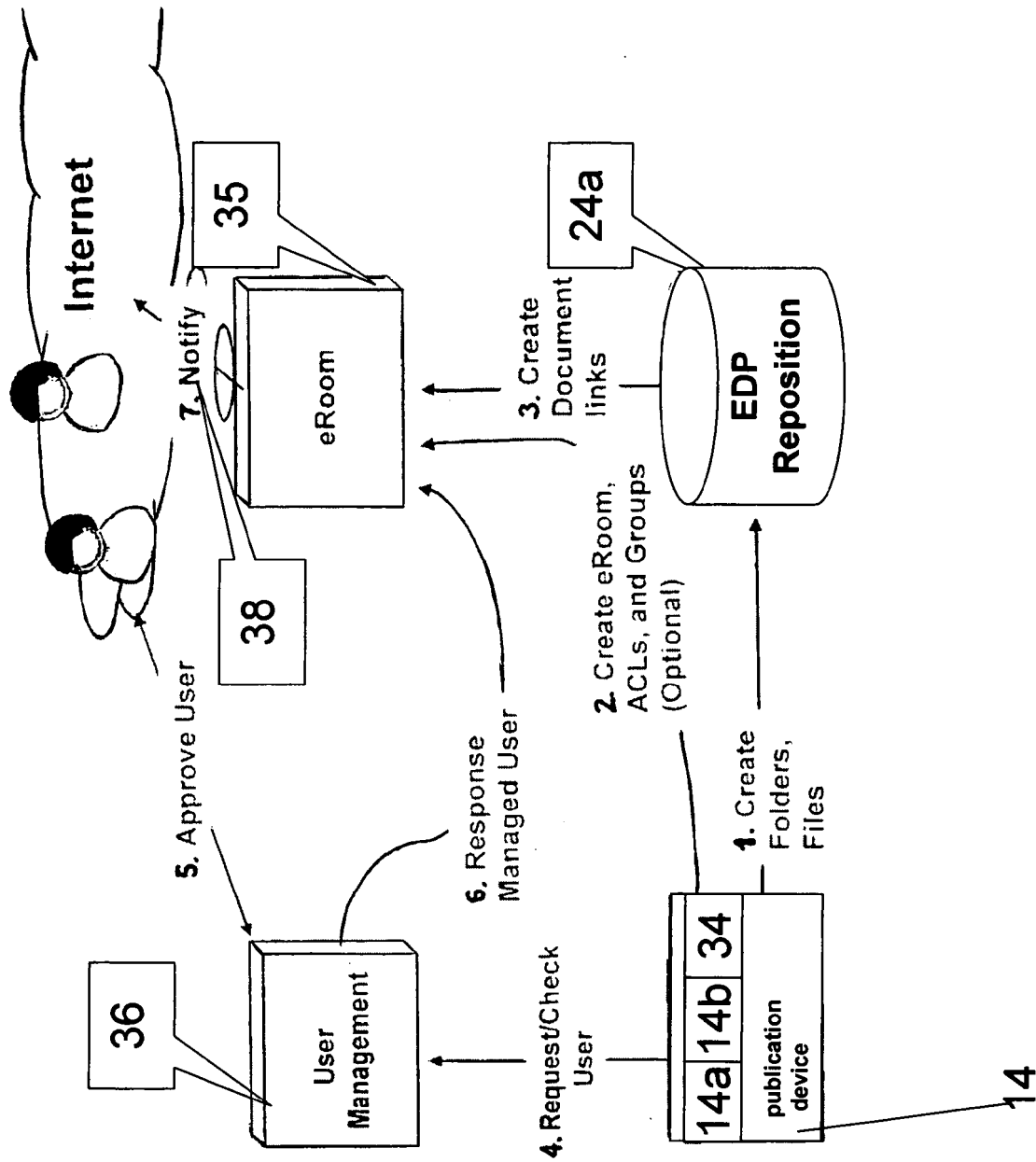


Fig. 1



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2009/004548

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F17/30 G06Q10/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/103854 A1 (ADAM FLORENCE [GB] ET AL) 1 May 2008 (2008-05-01)	1,8,9, 12-15, 17-21
Y		2-7,10, 11
A	paragraphs [0006] - [0087]	16
Y	WO 02/052381 A (WARP SOLUTIONS INC [US]) 4 July 2002 (2002-07-04) abstract page 24, lines 14-22	2,10
Y	US 2007/016593 A1 (LIESKE CHRISTIAN [DE] ET AL) 18 January 2007 (2007-01-18) paragraphs [0021] - [0029]	3-7,11



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

30 October 2009

Date of mailing of the international search report

05/11/2009

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Bowler, Alyssa

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2009/004548

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008103854 A1	01-05-2008	CN 101170557 A	30-04-2008
WO 02052381 A	04-07-2002	AU 2002232835 A1	08-07-2002
US 2007016593 A1	18-01-2007	NONE	