

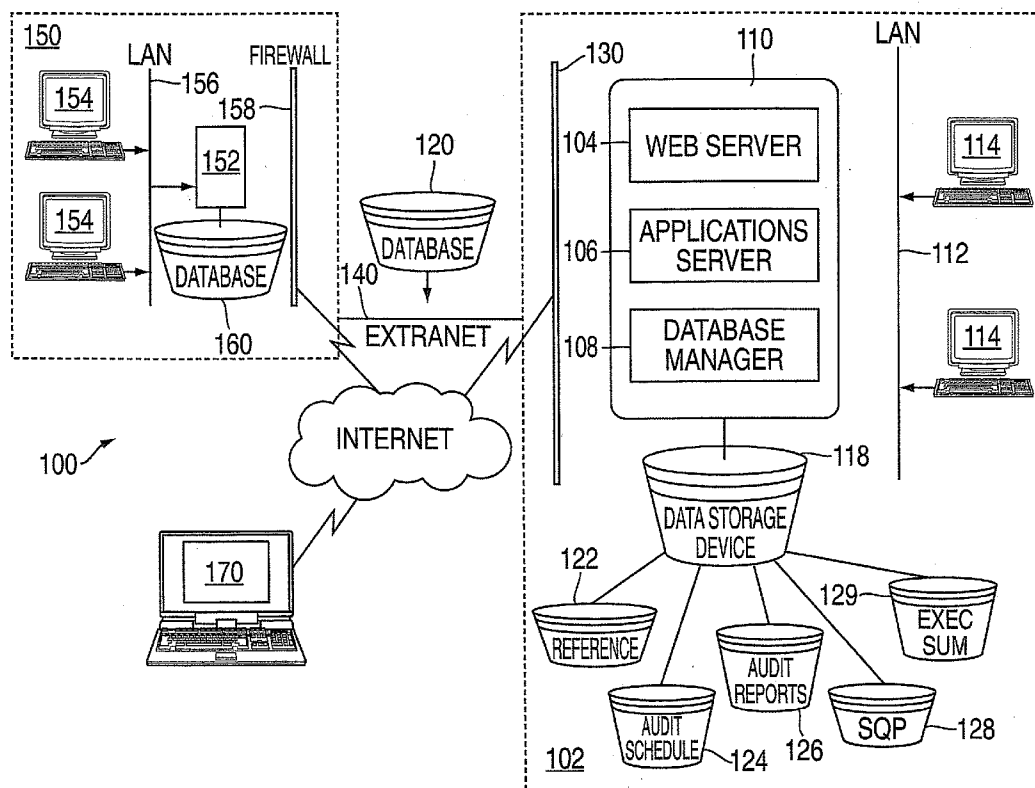


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(19) **United States**(12) **Patent Application Publication**
McKay et al.(10) **Pub. No.: US 2008/0040207 A1**(43) **Pub. Date: Feb. 14, 2008**(54) **METHOD AND SYSTEM FOR GATHERING
AND DISSEMINATING QUALITY
PERFORMANCE AND AUDIT ACTIVITY
DATA IN AN EXTENDED ENTERPRISE
ENVIRONMENT****Related U.S. Application Data**(62) Division of application No. 09/749,846, filed on Dec.
27, 2000.**Publication Classification**(51) **Int. Cl.**
G06F 11/34 (2006.01)(52) **U.S. Cl.** **705/11**(57) **ABSTRACT**

A method for facilitating supplier auditing functions in a communications network environment is disclosed. The method includes receiving a request from a user system of an enterprise system to initiate an activity. The activity includes assessing a supplier record for determining a need to schedule a supplier audit, and scheduling the audit for performing an initial or ongoing qualification of an existing or prospective trading partner of the enterprise system. Assessing the supplier record includes reviewing past audit activity, date of last audit, and results of past audits. The enterprise system retrieves data from at least one database, which corresponds to the request. The enterprise system includes a quality information network application for executing activity options that include the activity requested by the user system.

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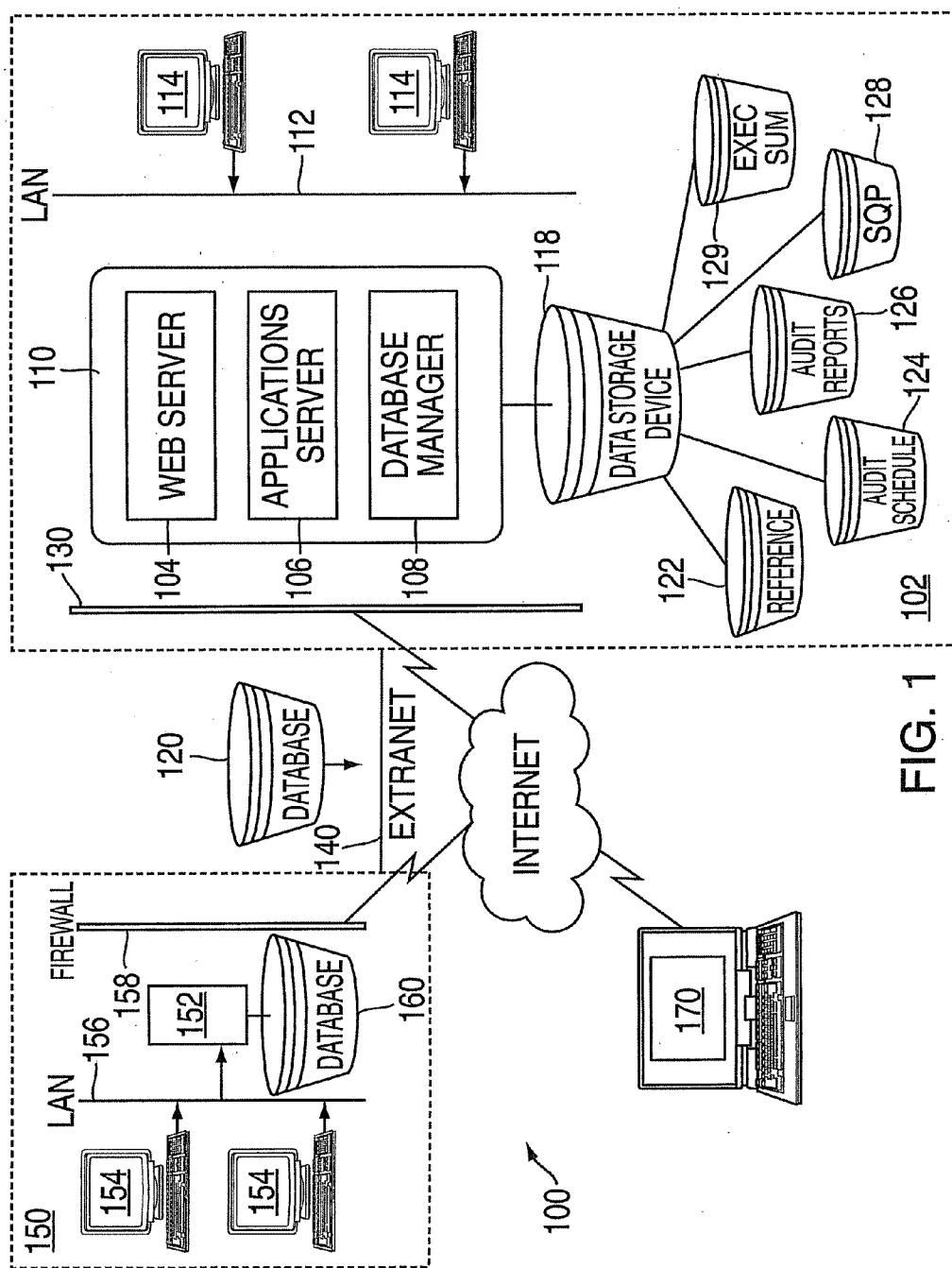


FIG. 1

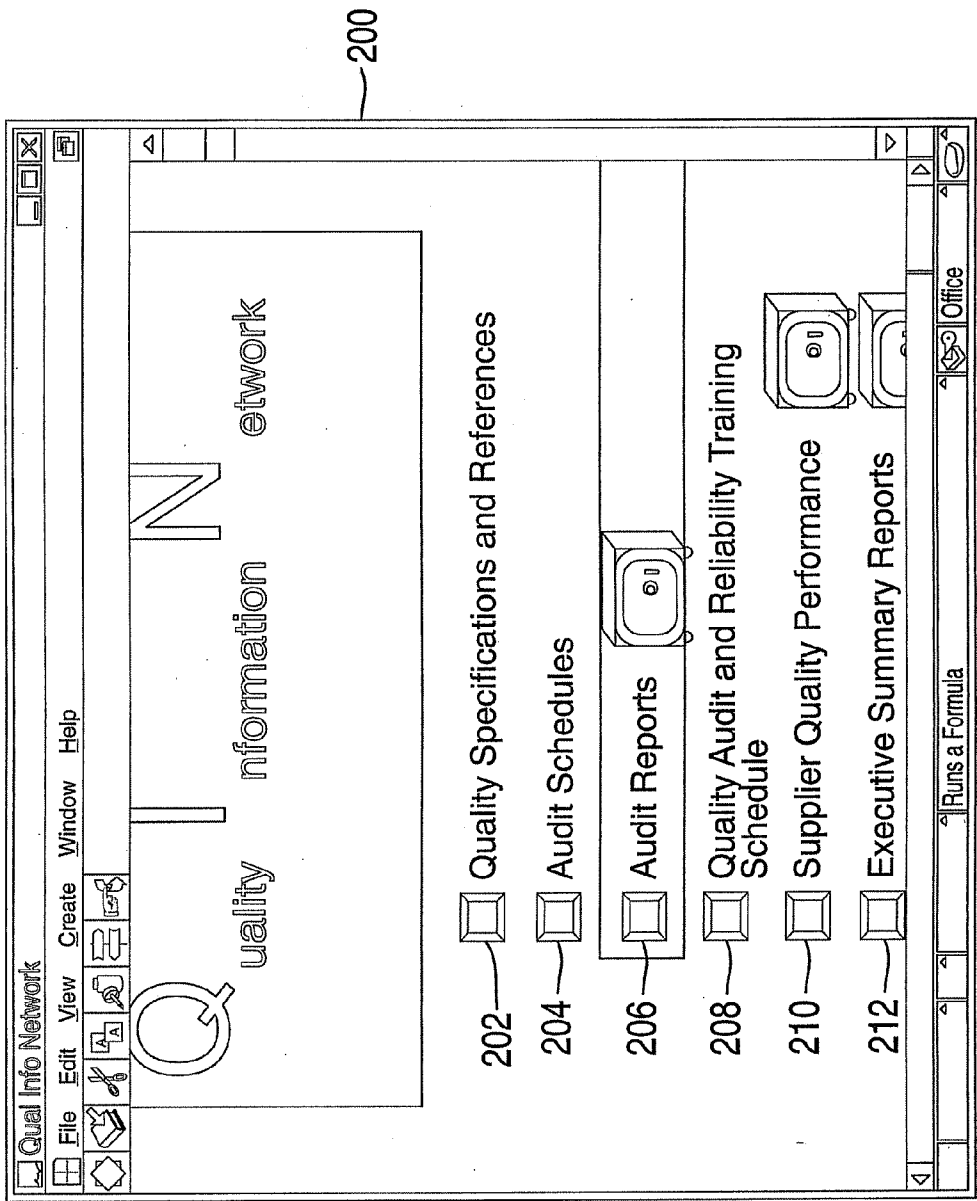


FIG. 2

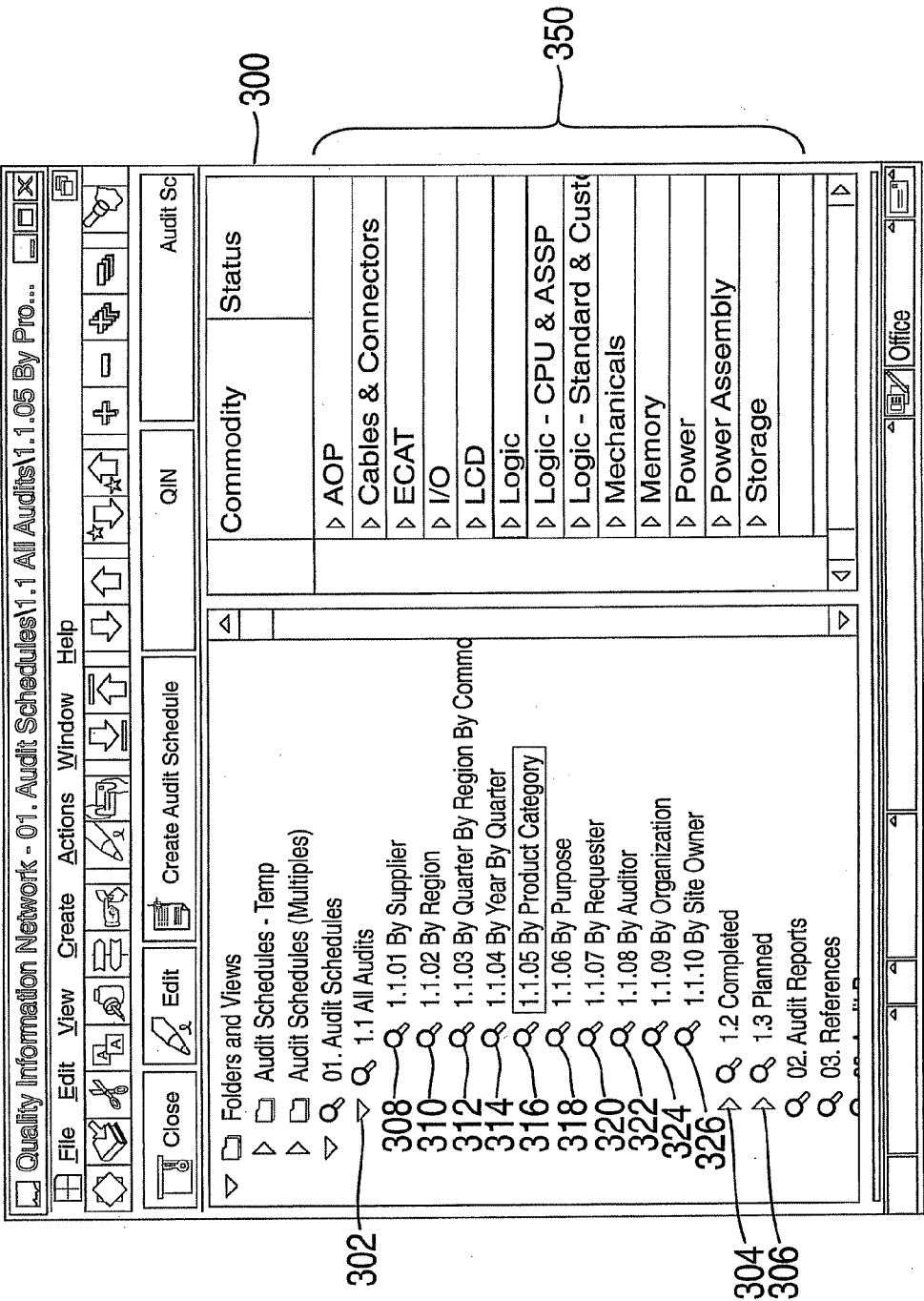


FIG. 3

400

Audit Schedule

File Edit View Create Actions Text Window Help

Close Save & File Print Help

Audit Information

* Requester last name [] * Requester first name []

* Requester site []

* auditor [] Phone []

User ID [] Organization []

* Date planned status [] Final []

* Date planned [] Quarter planned []

Date completed [] Quarter completed []

Status Planned

* Purpose [] ?

Comments []

Required - Select name of the supplier to be audited

Office

404

406

402

408

410

FIG. 4

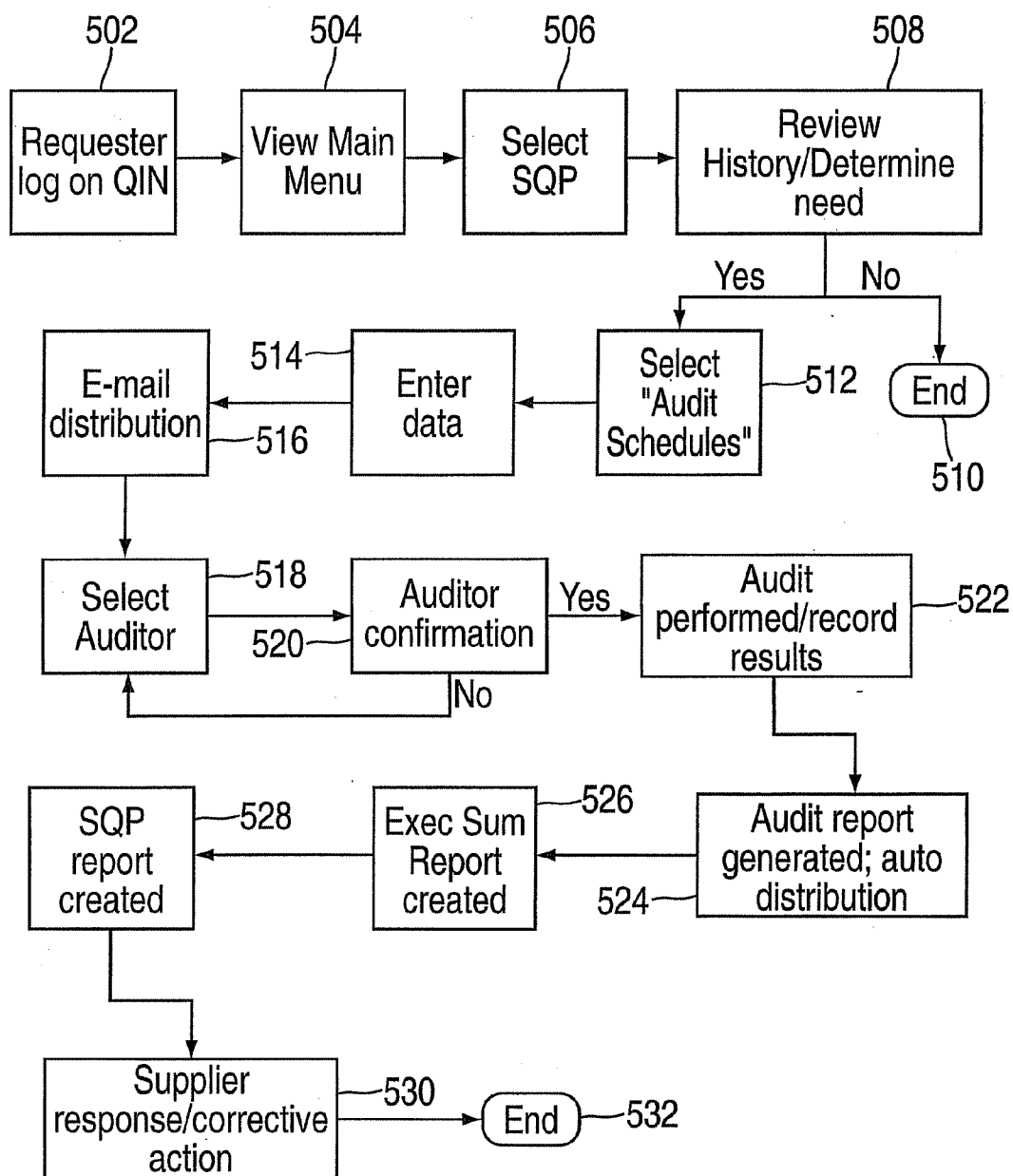


FIG. 5
AUDIT PROCESS FLOW

**METHOD AND SYSTEM FOR GATHERING AND
DISSEMINATING QUALITY PERFORMANCE AND
AUDIT ACTIVITY DATA IN AN EXTENDED
ENTERPRISE ENVIRONMENT**

**CROSS-REFERENCE TO RELATED
APPLICATION**

[0001] This application is a divisional application of U.S. Ser. No. 09/749,846 Dec. 27, 2000, the contents of which are incorporated by reference herein in their entirety.

BACKGROUND OF THE INVENTION

[0002] This invention relates generally to a computer-based method and system for supply chain management, and more particularly, this invention relates to a method and system for gathering and disseminating quality performance and audit activity data in an extended environment.

[0003] With the advent of the Internet and related technologies, complex networking systems have evolved that enable distant trading partners operating disparate computer systems to interact with one another. The Internet provides a ubiquitous message routing architecture that supports reliable inter-business connectivity around the world, based on common communication protocols and common standards for system interoperability. Further, the Internet and related intranet and extranet technologies offer a relatively low cost of entry, making them practical for use by large and small businesses alike. Web-based security issues have been minimized through the use of intranets that connect a business' internal processes to the applications and data they need and extranets that connect external processes to the applications and data they need. Firewalls or security devices are added to protect against unauthorized access to the internal network and to isolate unauthorized Internet access from the extranet. With this new technology in place, existing trading barriers between trading partners can be removed, allowing for a synchronized flow of information.

[0004] A recent trend in electronics manufacturing involves contracting out some or all of the manufacturing of a company's products to third party manufacturers which then build these products according to specification. This arrangement, known as outsourcing, results where the original manufacturer (called an Original Equipment Manufacturer, or OEM) buys assemblies in bulk from third-party contract manufacturers and then customizes them for a particular application. It then markets and sells the customized equipment under its own name. By outsourcing the manufacturing and assembly of these goods, established OEMs are able to focus on other business areas such as new product development and customer relationship management. Additionally, as product designs and components are becoming increasingly complex and frequently updated, a contract manufacturer with specialized skills may be better equipped to accommodate the changing technology. By outsourcing to meet peak demands, an OEM may be able to avoid having to build new facilities and/or hire new people.

[0005] An OEM who is outsourcing the manufacturing of its products needs to be able to collaborate with its contract manufacturers and suppliers before, during, and after the manufacturing cycle in order to achieve maximum efficiency of the production process. One area of collaboration is supplier auditing and reporting. Technology shifts are caus-

ing new technical suppliers to rise in an ever-increasing worldwide space. With this rise in suppliers, comes the need for new quality control measures including auditing processes. Before integrating a supplier technology into an OEM's product, a supplier is often subjected to a rigorous audit to ensure that correct technical processes are followed and to ensure technical capability. Supplier audit management must be able to handle the audit process where the OEM has offices located around the world and buys from suppliers equally spread out. Traditional methods of qualifying suppliers and performing auditing procedures often result in redundant or unnecessary audits where inefficient, incomplete, or outdated records provide incorrect information. This is compounded by the fact that multiple procurement divisions of an OEM may not always know what other divisions are doing due to inadequate communications, employee turnover, and/or geographic separation. Further, old auditing methods that involved tracking down a particular auditor who possessed the requisite skills necessary to perform the audit was tedious and time consuming and often involved scheduling the auditor to travel excessive distances to the audit sites. Finally, old audit methods provided inconsistent results where audit reports took on different formats depending upon the division requesting the audit, resulting in non-standardized audit reports and unsatisfactory results. The present invention seeks to eliminate or reduce the above inefficiencies by providing a centralized storage system and process for creating, editing and storing auditing schedules, reports, and reference materials via a collaborative, web-enabled workgroup application.

SUMMARY OF THE INVENTION

[0006] A method for facilitating supplier auditing functions in a communications network environment is disclosed. The method includes receiving a request from a user system of an enterprise system to initiate an activity. The activity includes assessing a supplier record for determining a need to schedule a supplier audit, and scheduling the audit for performing an initial or ongoing qualification of an existing or prospective trading partner of the enterprise system. Assessing the supplier record includes reviewing past audit activity, date of last audit, and results of past audits. The enterprise system retrieves data from at least one database, which corresponds to the request. The enterprise system includes a quality information network application for executing activity options that include the activity requested by the user system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Referring now to the drawings wherein like elements are numbered alike in the several FIGURES:

[0008] FIG. 1 is a block diagram of a portion of the system that includes a plurality of workstations and servers on which the quality information network application is implemented;

[0009] FIG. 2 illustrates an exemplary main menu screen for the quality information network application;

[0010] FIG. 3 illustrates an exemplary audit schedule menu and product category submenu screen for the quality information network application;

[0011] FIG. 4 illustrates an exemplary audit schedule form screen for the quality information network application; and

[0012] FIG. 5 is a flowchart describing the quality information network audit process.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] The quality information network application is a collaborative tool used to facilitate the supplier auditing and reporting processes in an extended enterprise environment. It provides a centralized storage system in which audit schedules, reports and miscellaneous documents can be created and viewed in a collaborative manner by various users inside and outside of an organization on a tiered-access basis. It allows outsiders of the organization to submit comments and view a limited portion of information in the quality information network databases via a secure network connection. System administrators for the organization establish and maintain the access permissions and set parameters for users of the quality information network tool in keeping with the objectives of the organization.

[0014] In an exemplary embodiment, the quality information application is implemented through a networked system such as that shown in FIG. 1. Although not necessary to realize the advantages of the present invention, system 100 may be part of a wide area network in which different geographical locations are interconnected, either by high-speed data lines or by radio links, interconnecting hundreds of workstations at widely disparate locations. In the simplified diagram of FIG. 1, system 100 includes an organization 102 comprising a web server 104, an applications server 106, and a database server 108 that are located on a host system 110 and connected through a network 112 to workstations 114. The term "organization" refers to the system implementing the quality information network application. Network 112 may comprise a LAN, a WAN, or other network configuration known in the art. Further, network 112 may include wireless connections, radio-based communications, telephony-based communications, and other network-based communications. For purposes of illustration, however, network 112 is a LAN. A firewall 130 limits access to organization 102 to those users outside of organization 102 who possess proper access permissions. Firewall 130 may comprise a gateway router, proxy server or a combination of similar hardware/software devices readily known by those skilled in the art.

[0015] Host system 110 is running suitable web server software designed to accommodate various forms of communications and which allows information in data storage device 118 to be published on a web site. For purposes of illustration, host system 110 is running Lotus Domino™ as its server software. Applications server 106 executes the quality information network tool, among other applications utilized by organization 102. Applications server 106 is also running a groupware application such as Lotus Notes™ which allows remote users to access information through its replication capabilities, provides e-mail services, and supports a secure extranet architecture.

[0016] Data storage device 118 resides within intranet 112 and may comprise any form of mass storage device configured to read and write database type data maintained in a file store (e.g., a magnetic disk data storage device). Data storage device 118 is logically addressable as a consolidated data source across a distributed environment such as net-

work system 100. The implementation of local and wide-area database management systems to achieve the functionality of data storage device 118 will be readily understood by those skilled in the art. Information stored in data storage device 118 is retrieved and manipulated via database server 108.

[0017] Data storage device 118 provides a repository for databases including a reference database 122, an audit schedule database 124, an audit reports database 126, a supplier quality performance database 128, an executive summary reports database 129, and any other information desired by organization 102 for use by the quality information network tool. These features are further described herein.

[0018] System 150 comprises a web server 152 that connects workstations 154 to an intranet 156 and to the Internet. Firewall 158 provides security and protection against unauthorized access to internal network information from outside sources. Each of workstations 154 may access web server 152 via internal web browsers (not shown) located on workstations 154. A data storage device 160 is coupled to server 152. Selected data fields and data from audit reports database 126 are replicated to database 120 and are accessible to system 150 via extranet 140. System 150 is typically an existing supplier or trading partner of organization 102. The terms 'supplier' or 'contract manufacturer' and 'trading partner' are used interchangeably throughout this description. Remote workstation 170 is coupled to organization 102 via a web browser (not shown) and modem (not shown) for communicating with organization 102.

[0019] A variety of user types may utilize the quality information network tool. These user types help define the nature and extent of access to data provided by organization 102. For purposes of illustration, four user types are described herein; however, an organization implementing the quality information network tool may define its own user types.

[0020] Divisional Users. Divisional users are typically engineers and developers of organization 102. Divisions of organization 102 are classified or sorted according to the product being manufactured. For example, one division may be dedicated to manufacturing/assembling personal computers. A second division might be responsible for the production of mainframe computers. A third division might involve storage devices. Divisional users may create, update, and transfer documents in data storage device 118 to other authorized users, but are limited to modifying only those documents relating to their division. A divisional user may be a requester of an audit.

[0021] Suppliers/Contract Manufacturers. These users are external to the organization but have a need to access certain information contained in data storage device 118. These users are restricted to viewing through the Internet or extranet 140 a limited segment of information in data storage device 118 to ensure the overall confidentiality of the documents contained therein. Trading partners at system 150 can input comments or attachments through data fields replicated from database 126 and submit them via extranet 140 to the data storage device 118.

[0022] Executive Readers. These users are typically high level executives of organization 102 with 'view only' access

to executive summary database **129**. Access is restricted to general information and executive summary data relating to audit reports and documents and is used for informational purposes.

[0023] Administrators. Administrators of organization **102** determine the access requirements for internal and external users of the quality information tool and maintain access control lists. They also provide user support as necessary. Administrators may further be categorized by division.

[0024] Access control lists store the names of authorized users of the databases stored in data storage device **118** and each user is assigned an access level by an administrator of organization **102**. Only administrators can add, modify or delete authorized users in the access control list.

[0025] A user accesses the quality information network application via a main menu screen as shown in FIG. 2. The options available to the user on main menu screen **200** include "Quality Specifications and References"**202**, "Audit Schedules"**204**, "Audit Reports"**206**, "Quality Audit and Reliability Training Schedule"**208**, "Supplier Quality Performance"**210**, and "Executive Summary Reports"**212**. These options are further described herein.

[0026] By selecting "Audit Schedules"**204**, a user can perform a variety of tasks such as viewing, editing or creating an audit schedule. As illustrated in FIG. 3, a user who desires to view an audit schedule may do so by selecting "All Audits"**302**, "Completed"**304**, or "Planned"**306**, whereby the quality information network tool retrieves the selected schedules for viewing. A user can further tailor the search for schedules to view all audit schedules broken down by: supplier **308**, region **310**, quarter by region by commodity **312**, year by quarter **314**, product category **316**, purpose **318**, requester **320**, auditor **322**, organization **324**, and site owner **326**. For example, a user selects "All Audits"**302** by product category **316** and is presented with a list of commodities as illustrated in sub-menu **350** of FIG. 3. The user then selects a commodity from sub-menu **350** and is presented with all audit schedules for that chosen commodity (not shown).

[0027] To create a new audit schedule, the user selects a commodity from the list on sub-menu **350**, and the schedule form **400** of FIG. 4 is presented to the user. The user enters required data into the fields presented such as supplier name and address (not shown), date or quarter planned **402**, requester information **404**, auditor selected to perform the audit **406**, purpose for the audit **408**, and any additional comments **410** as necessary. The quality information tool provides drop down items for selected data fields to allow for convenient, standardized entries as shown generally in form **400**.

[0028] Results from completed audits may be viewed by divisional users of organization **102** by selecting "Audit Reports"**206** from main menu **200** of FIG. 2. Audit reports provide detailed information concerning the subject audit from the auditor **406** assigned and listed on schedule form **400**. These reports are condensed in summary form by the quality information network tool and stored in executive summary database **129** for easy access and viewing by managing executives of organization **102**. In this manner, all desired levels of management are able to keep apprised of audit-related activities and supplier performance. Having this information enables management to make instant business decisions.

[0029] Specific audit data is extracted from these audit reports and stored in supplier quality performance database **128** by the quality information network tool for rating purposes. Supplier quality performance database **128** contains performance indicators for audited suppliers measured by business rules adopted by organization **102** in order to compare and rate various suppliers. This information allows organization **102** to spot performance trends among suppliers audited such as areas of strength or weakness, specific technology capabilities, as well as other performance factors. It also creates a historical view of all audits performed so that organization **102** can quickly determine when or whether a supplier should be scheduled for an audit.

[0030] Reference database **122** contains technical information such as audit specifications, industry quality standards, as well as standardized reporting forms for selection by an auditor of organization **102**. A divisional user of organization **102**, such as an auditor, may need to know what the minimum industrial standards are for a certain product or component in order to verify whether a supplier is in conformance with those standards. An auditor may also want to access reference database **122** to ensure that the quality information sought via the scheduled audit is in conformance with organization's **102** audit specifications. Also included in reference database **122** is an updatable training section for auditing divisional users who want to improve their auditing skills. This section provides a list of auditing classes, seminars, and job resources available to interested parties of organization **102**. In this manner, the auditing branch of organization **102** is kept apprised of new government regulations concerning industry standards, as well as auditing techniques and procedures.

[0031] FIG. 5 illustrates a sample process flow for the quality information network tool describing how a divisional user of organization **102** who is considering scheduling an audit proceeds via the tool. A requester at one of workstations **114** or remote workstation **170** logs on to the quality information network tool at step **502**. The main menu screen **200** illustrated in FIG. 2 appears at step **504**. In order to assess whether an audit is necessary for a given supplier, the requester first selects the supplier quality performance option **210** of FIG. 2 at step **506**. The quality information tool retrieves selected information pertaining to that supplier from supplier quality performance database **128** and delivers it to the user. The user then reviews the supplier record which contains a history of audits and reporting documents pertaining to that supplier at step **508**. From this information, the requester assesses whether an audit is required. For example, organization **102** has a policy to audit a particular class of suppliers on a semi-annual basis before renewing contracts for work. The supplier record stored in database **128** reveals that an audit has not been performed for ten months. In this case, the requester would need to schedule an audit. If the requester determines that an audit is not required, the process ends at step **510**. Otherwise, flow proceeds to step **512** where the requester selects "Audit Schedules"**204** from main menu **200**. The data required as illustrated in FIG. 4 is entered at step **514**. The requester can select whom this information will be distributed to at step **516** or the quality information tool may automatically designate a distribution list according to business rules defined by organization **102**. The requester selects an auditor to perform the audit at step **518**. This can be accomplished via a drop down tool as illustrated generally in FIG. 4 in auditor

field **406**. The quality information network provides a list of auditors which may be categorized by specialty, skills, and/or geographic location. The tool may also be configured to pre-qualify an auditor for the requester based upon information provided such as audit site location, commodity, etc. Further, the quality information network tool automatically generates an e-mail to the auditor selected with selected information and requesting confirmation of the audit at step **520**. If the auditor responds negatively, flow reverts back to step **518** whereby the requester must select another auditor. Once positive confirmation is received, the audit schedule is stored in audit schedules database **124** awaiting execution. Once the audit is completed, the auditor records the information via the quality information tool and attaches the results to the audit schedule at step **522**. The quality information network tool generates an audit report, stores the report in the audit reports database **126**, and automatically sends an e-mail at step **524** to the distribution list described above. The quality information network tool creates a summarized version of the report at step **526** and stores it in the executive summary database **129**. A supplier quality performance report is generated by the tool at step **528** and stored in the supplier quality performance database **128**. The results can be sent electronically to the supplier or subject of the audit at system **150** and the supplier may respond accordingly at step **530**. The response may include comments or corrective actions planned or taken by the supplier. The process then ends at step **532**.

[**0032**] The quality information network tool is a comprehensive, centralized, electronic repository for supplier audit data for use by development, procurement and manufacturing organizations to manage the supplier audit process. It is a workgroup collaboration tool that allows for the sharing of technical supplier audit data that is both internal to the organization across multiple divisions and locations, and directly with the supplier being audited. Benefits include streamlined communication with suppliers and the elimination of redundant activities. The quality information network tool provides a worldwide tool for gathering and communicating objective information about supplier quality performance and audit activity. Additional communication features include automatic e-mails to customizable distribution lists when audit records are created and completed, as well as supplier access to audit data.

[**0033**] As described above, the present invention can be embodied in the form of computer-implemented processes and apparatuses for practicing those processes. The present invention can also be embodied in the form of computer program code containing instructions embodied in tangible media, such as floppy diskettes, CD-ROMs, hard drives, or any other computer-readable storage medium, wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. The present invention can also be embodied in the form of computer program code, for example, whether stored in a storage medium, loaded into and/or executed by a computer, or transmitted over some transmission medium, such as over electrical wiring or cabling, through fiber optics, or via electromagnetic radiation wherein, when the computer program code is loaded into and executed by a computer, the computer becomes an apparatus for practicing the invention. When implemented

on a general-purpose microprocessor, the computer program code segments configure the microprocessor to create specific logic circuits.

[**0034**] While preferred embodiments have been shown and described, various modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the present invention has been described by way of illustration and not limitation.

What is claimed is:

1. A method for facilitating supplier auditing functions in a communications network environment, comprising:

receiving a request from a user system of an enterprise system to initiate an activity, said activity including assessing a supplier record for determining a need to schedule a supplier audit, and scheduling the audit for performing an initial or ongoing qualification of an existing or prospective trading partner of the enterprise system;

wherein said assessing said supplier record includes reviewing:

past audit activity;

date of last audit; and

results of past audits; and

said enterprise system retrieving data from at least one database, said data corresponding to said request;

wherein further said enterprise system includes a quality information network application for executing activity options that include the activity requested by the user system.

2. The method of claim 1, wherein said scheduling said audit includes:

entering supplier data relating to the trading partner into a schedule form;

entering requester information into said schedule form;

selecting an auditor to perform said audit;

entering a purpose for said audit;

entering a time frame for performing said audit; and

distributing a completed schedule form to at least one entity;

3. The method of claim 2, wherein said distributing said completed schedule form is automatically performed by said quality information network application via a distribution list.

4. The method of claim 2, wherein said distributing said completed schedule form is manually performed by said requester via a distribution list provided by said requester.

5. The method of claim 2, wherein said selecting said auditor by said requester includes selection criteria including:

geographic location of site to be audited;

auditing skills possessed by said auditor;

a commodity subject to said audit; and

auditor pre-qualification data.

6. The method of claim 5, further comprising:
 automatically transmitting a notice to said auditor;
 receiving a response to the notice from said auditor by
 said requester, wherein said response is either a con-
 firmation notice or a rejection notice.

7. The method of claim 6, wherein said requester initiates
 a second auditor selection, based upon receiving said rejec-
 tion notice.

8. The method of claim 2, wherein said entering said time
 frame for performing said audit includes:

entering a date planned for said audit; and

entering a quarter planned for said audit.

9. The method of claim 1, wherein said requester is a
 divisional user comprising at least one of an engineer and
 developer of the enterprise system, the divisional user
 requesting an audit of a trading partner that corresponds with
 an engineering or developer group to which the divisional
 user belongs.

10. The method of claim 1, wherein said activity includes
 viewing a scheduled audit.

11. The method of claim 10, wherein said viewing said
 scheduled audit includes viewing by categories, said cat-
 egories including:

all audits,

completed audits; and

planned audits.

12. The method of claim 13, wherein said viewing said
 scheduled audit includes viewing by:

trading partner;

region;

quarter by region by commodity;

year by quarter;

product category;

requester;

auditor;

organization; and

site owner.

13. The method of claim 1, wherein said activity includes
 providing audit reporting data by an auditor.

14. The method of claim 13, wherein said providing said
 audit reporting data includes:

providing audit test results;

providing audit analysis results;

providing data pertaining to deficiencies in meeting indus-
 try standards;

providing data pertaining to deficiencies in meeting gov-
 ernment standards;

providing data pertaining to deficiencies in meeting pro-
 prietor-imposed standards;

attaching said audit reporting data to a corresponding
 audit schedule;

transmitting said audit reporting data and said correspond-
 ing audit schedule to a designated entity; and

proposing corrective actions.

15. The method of claim 14, wherein said transmitting
 said audit reporting data and said corresponding audit sched-
 ule is performed automatically by said quality information
 network application via a distribution list.

16. The method of claim 14, wherein said transmitting
 said audit reporting data and said corresponding audit sched-
 ule is performed manually by said auditor via a distribution
 list provided by said auditor.

17. The method of claim 1, wherein said activity includes
 viewing audit reports.

18. The method of claim 1, wherein said activity includes
 viewing training data.

19. The method of claim 18, wherein said training data
 includes:

lectures;

seminars;

classes; and

resource materials.

20. The method of claim 1, wherein said activity includes
 viewing reference data, said reference data including:

industry standards;

government standards; and

proprietor-imposed standards.

* * * * *