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(54) **SYSTEM AND METHOD FOR MANAGING A REGULATED INDUSTRY**

(76) Inventors: **Anjali Rani Kataria**, San Francisco, CA (US); **Kamlesh Rashmi Desai**, San Francisco, CA (US)

Correspondence Address:
DORSEY & WHITNEY LLP
Suite 400
1660 International Drive
McLean, VA 22102 (US)

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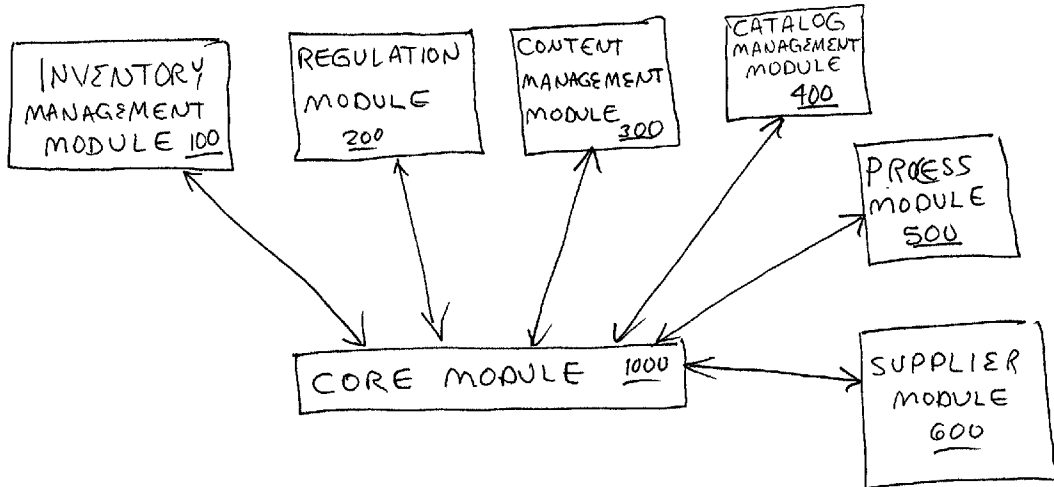
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(57) **ABSTRACT**

A system and a method enable supply chain solutions for regulated industries. The embodiments facilitate regulatory and tax compliance management integrated with smart inventory and e-warehouse management solutions. The embodiments are applicable to heavily regulated industries such as, for example, beverages, food, oil, pharmachemicals, and chemicals.

5

5

CATALOG
MANAGEMENT
MODULE 400

PROCESS
MODULE
500

SUPPLIER
MODULE
600

CONTENT
MANAGEMENT
MODULE 300

REGULATION
MODULE
200

CORE MODULE 1000

INVENTORY
MANAGEMENT
MODULE 100

FIGURE 1

12

WEB
SITE

10

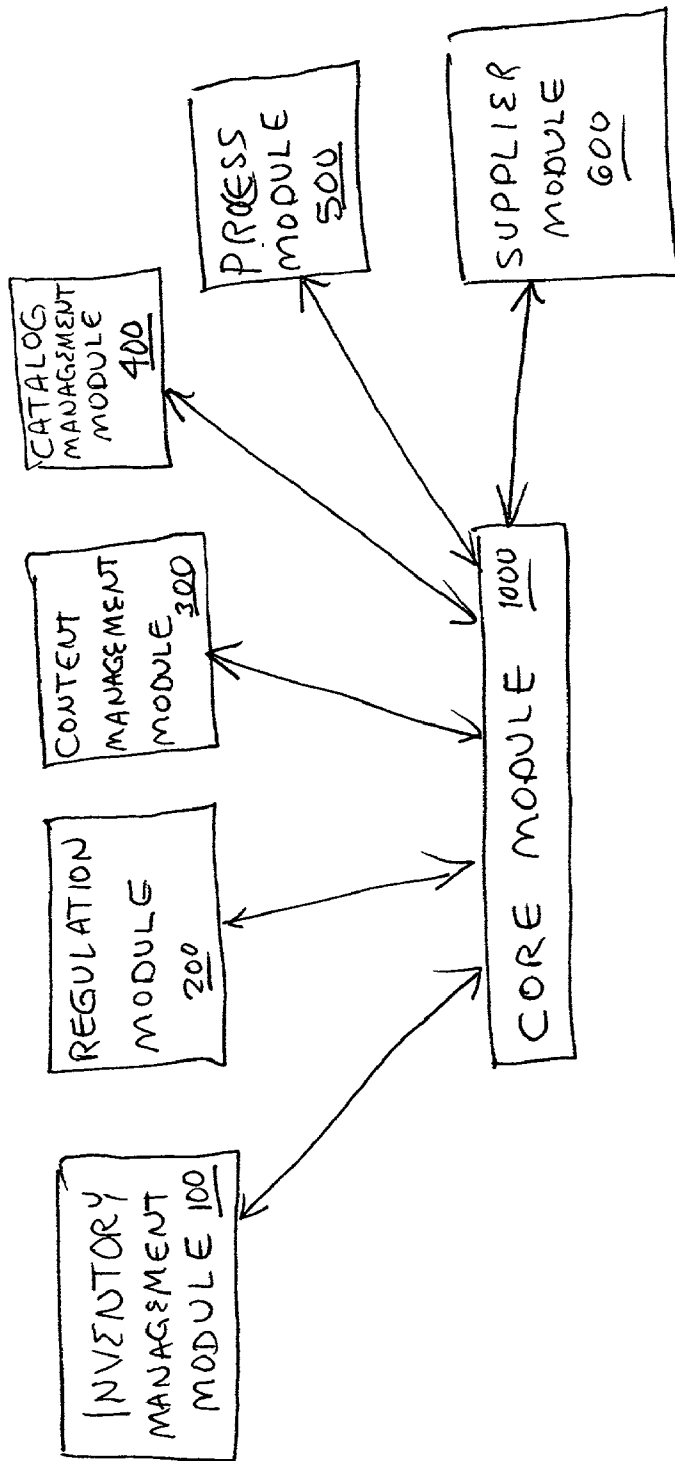20 — SUPPLY CHAIN
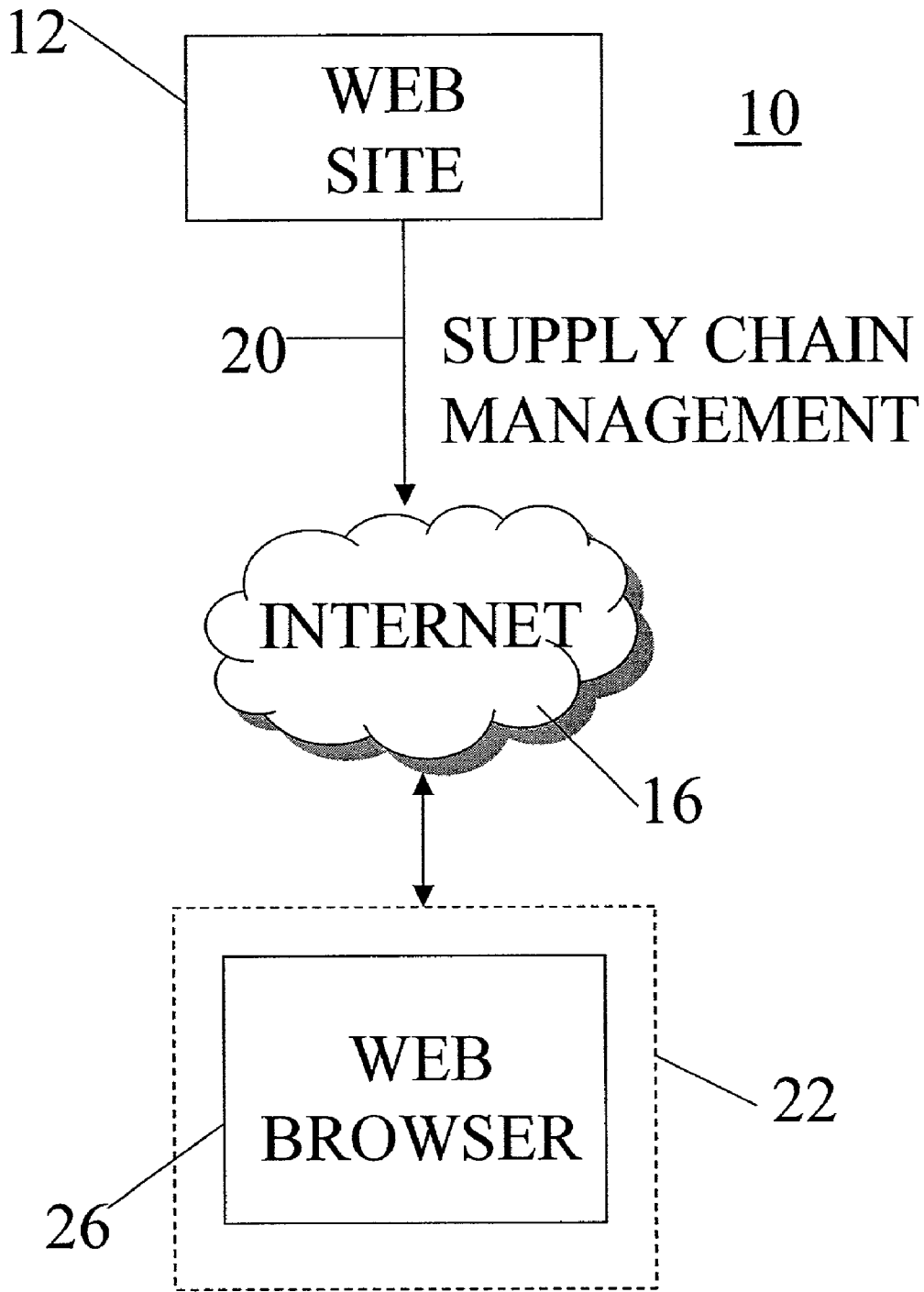MANAGEMENT

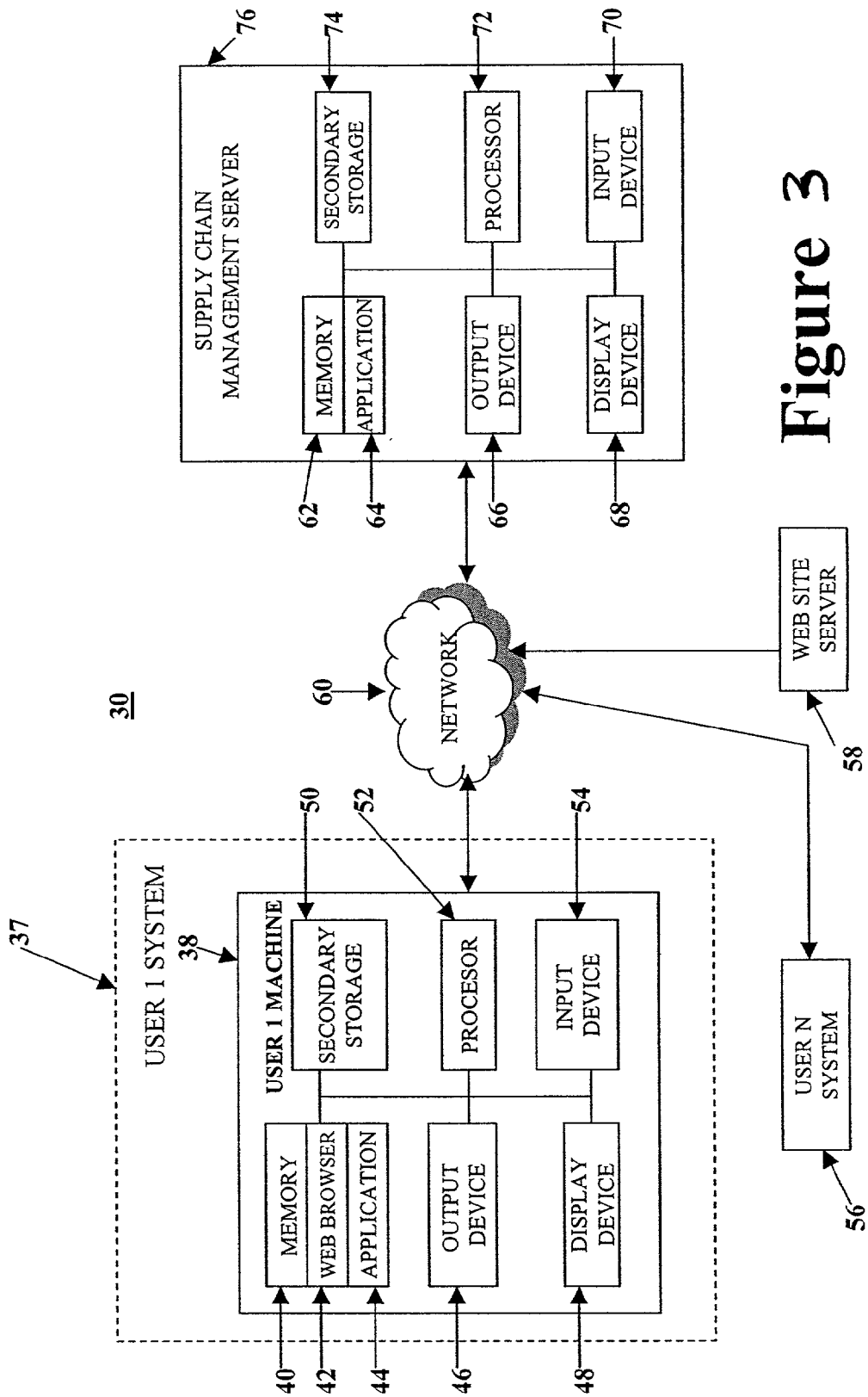INTERNET

16

WEB
BROWSER

22

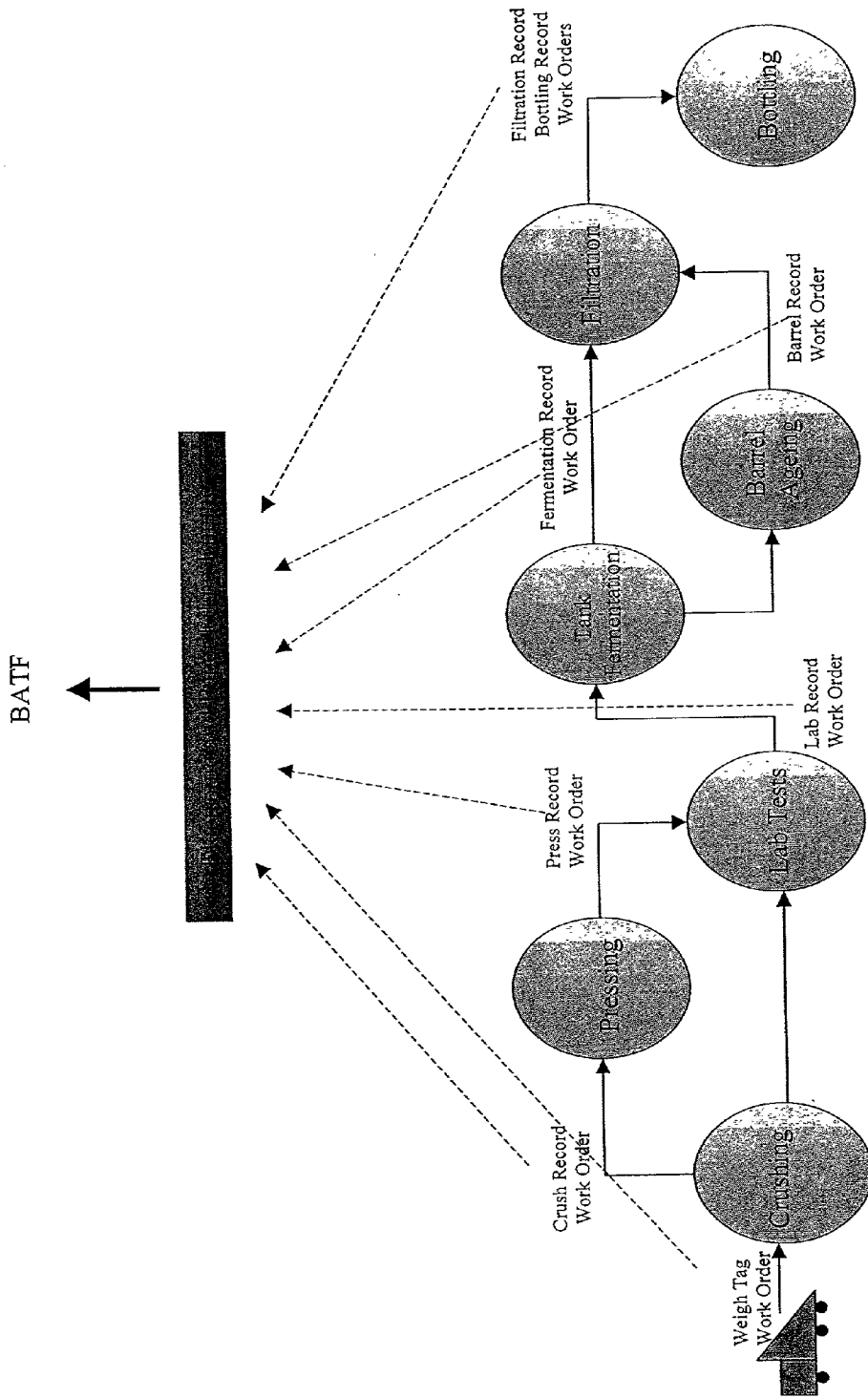26

Figure 2

Figure 3

FIGURE 4

SYSTEM AND METHOD FOR MANAGING A REGULATED INDUSTRY

PRIORITY APPLICATION

[0001] The present application claims priority to Provisional Application No. 60/263,177, entitled "METHOD AND APPARATUS FOR PROVIDING SUPPLY-SIDE CHAIN MANAGEMENT SOLUTIONS," filed Jan. 23, 2001, the entire contents of which are hereby incorporated by reference.

TECHNICAL FIELD

[0002] This invention relates to management of regulated industries. In particular, the present invention facilitates regulatory, tax compliance, inventory and e-warehouse management of regulated industries.

BACKGROUND

[0003] Heavily regulated and process oriented industries such as oil, food, beverage, chemicals, cosmetics and pharmaceuticals share a number of common characteristics: they are highly regulated; their content is either dynamically changing or very complex; they are subject to large fines for non-compliance; they are heavily process oriented; they require extensive record keeping; they have complex order tracking; they require indirect goods/input goods; and they have low visibility of process inputs. Currently there are no broad web-based solutions that fully meet needs of record keeping in process management of heavily regulated industries. In fact, many of the record keeping functions and filing processes for federal and state regulations still occur through outdated manual time-consuming means.

[0004] As an example, compliance in the wine industry begins as soon as the grapes reach the winery. This necessitates wineries to track where the grapes were grown, how they were shipped to the winery and the tonnage used throughout production, bottling and aging. This process can go on for many years. In addition, alcohol content during fermentation and the bottling/aging process must be tracked. Since a winery's ability to comply with the multitude of regulations hinges on capturing specific information throughout the continuous production process which is also tied to inventory, it is integral that compliance be tied into the winery's supply chain management.

[0005] This above problems are primarily due to the lack of industry-specific solutions that integrate regulatory compliance with inventory management. As a result, the production process is fragmented, labor intensive, inefficient, and expensive—resulting in a very high cost of goods sold, (averaging about 50-80% of net revenues) and high general and administrative costs (averaging 10-35% of net revenues). Regulatory compliance issues and the in-process inventory in the wine industry create a need for tailored supply chain solutions.

[0006] Wineries today also have limited visibility into their internal operations, with little real-time information of their wine in process inventory levels. The wine making side of the industry often lacks the ability to report how many bottles of a certain type of wine that they have in their cellar. They also find it difficult to match production levels with inventory needs, resulting in inefficient buying. Bulk wine supply is also difficult to manage.

[0007] Wineries often enjoy preferred supplier relationships formed by verbal agreements with favorable pricing terms. However, they seldom have centralized or consolidated purchasing among their subsidiaries resulting in varying pricing agreements. They regard their ingredients, supplier lists, and their recipes as proprietary information requiring high levels of security. Also, wineries have limited technology staff, thus requiring greater external hands-on support.

[0008] Known DOS/PC based products that focus on one particular need of the wine industry do not address the problems described above. Known systems: lack total supply chain management solutions; do not provide complete regulation and tax compliance management; licensing on a per seat basis; and have limited ability to provide visibility into internal operations, in particular they lack real time accessibility to all employees of the company.

[0009] As a result of the above problems in the wine industry, everything from inventory management, regulatory and tax compliance, and order fulfillment on the supply side is fragmented both inside and outside the enterprise, labor intensive, inefficient, and expensive. Regulatory and tax compliance is manual, complex and time consuming; suppliers and buyers lack visibility; parent companies have little real time information on the buy and spend categories of their subsidiaries; and there is little coordination between supplier production and buyer demand. As a result of such problems, the cost of goods sold in the wine industry averages 50-80% of net revenues, and general and administrative costs are often as high as 10-35% of net revenues.

SUMMARY OF THE INVENTION

[0010] According to an embodiment, embodiments of a system and a method are described that will enable supply chain solutions for regulated industries. The embodiments facilitate regulatory and tax compliance management integrated with smart inventory and e-warehouse management solutions. The embodiments are applicable to heavily regulated industries such as, for example, beverages, food, oil, pharmachemicals, and chemicals.

[0011] A first embodiment allows regulatory compliance integrated with complete, real time web-based supply chain infrastructure customized to the industry providing: a regulatory and tax database with automated compliance and tax reporting; inventory in process management for the tracking of grapes, their harvest and their juice through the production process; bulk wine management overall inventory management generating visibility into inventory levels and operations; content management for industry-specific or company-specific information; online catalog management for supplier offerings; private marketplaces exchange, procurement, shipping management, demand and forecasting tools, wireless applications, and regulatory e-filings in future releases.

[0012] The first embodiment provides industry-specific solutions to regulatory and tax compliance issues, including integrated industry-specific, supply chain applications to assist in compliance. Therefore, while there are other back-end office and supply chain management solution providers, they are not, for example, wine-industry specific, nor do they focus on the regulatory and compliance issues, which are integral to any beverage company's supply chain. The first

embodiment architecture is designed to operate alongside existing systems to provide complimentary applications.

[0013] The first embodiment enables users to manage regulatory filings, tax compliance, inventory—and correspondingly their warehouse. This aspect reduces supply chain inefficiencies with a real-time, web-based, enterprise-wide supply chain infrastructure. This aspect achieves a substantial reduction of the current cumbersome paper trail, but they afford users more accurate and timely compliance, thus avoiding violations and substantial fines/penalties.

[0014] The first embodiment may provide supply chain solutions to increase visibility throughout the a regulated industry's operations. This aspect enables greater information management through secure access to real time information; and advanced planning. This aspect provides users worry-free management while reducing costs, inventory levels, and decreasing working capital needs. The embodiment can be wireless ready, enabling the user to more efficiently and effectively manage critical data.

[0015] Through an extremely thin, lightweight, and scalable platform, the first embodiment can perform real time web-based regulatory and tax compliance based supply chain infrastructure.

[0016] The first embodiment can also provide regulatory and tax compliance, inventory management, content management and supplier catalog management modules. Private marketplaces exchange, procurement, shipping management, demand and forecasting tools and regulatory e-filings will complement the supply chain solutions.

[0017] The first embodiment can interface with many third party enterprise resources planning applications and existing legacy systems. The system can be java-based, using open API systems, and can be highly scalable, flexible, robust, modular and portable (PDA and wireless capable). The system can use thin client architecture requiring only a web browser. The system can be implemented without requiring desktop installation. The system can support Secure Sockets Layer (SSL) to protect the transmission of content between the browser and the server. In addition, user identification and password protections will be embedded as well as controls based upon user roles.

[0018] Those skilled in the art will appreciate these and other advantages and benefits of various embodiments of the invention upon reading the following detailed description of a preferred embodiment with reference to the below-listed drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0019] FIG. 1 is a block diagram of a system according to a first embodiment;

[0020] FIG. 2 is a diagram illustrating operation of an embodiment of a supply-side chain management application;

[0021] FIG. 3 is a block diagram illustrating hardware components for implementing a web based supply-side chain management application; and

[0022] FIG. 4 is a diagram of a regulated industry and its process.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0023] FIG. 1 is a block diagram of a system 5 according to a first embodiment. The system 5 comprises an inventory management module 100, a regulation module 200, a content management module 300, a catalog management module 400, a process module 500, a supplier module 600, and a core module 1000.

[0024] The inventory management module 100 includes domain knowledge of the wine industry to specifically address the needs of the wine industry. The needs addressed are: the movement of unlabeled grapes and juice and their differing values as they move through the production process, the tracking of harvests, and spoilage factors. In addition, the inventory management module 100 provides visibility into a company's inventory at the subsidiary or corporate level, as well as track the inventory through the winemaking process. The inventory management module 100 implements inventory threshold levels and reorder points and triggers a notification via email, pager or WAP. The inventory management module 100 will provide the ability for both the winery and their supplier with views into internal inventory levels. The inventory management module provides for the following functions: receipt and issue of goods; movement of goods; and verification of goods locations.

[0025] The regulation module 200 addresses the need for compliance with complex and varied federal and state regulations for alcohol production. The regulation module 200 will provide the most current regulatory and tax compliance information affecting the wine industry. This regulatory and tax database will also include automated compliance and tax reporting. The regulation module 200 will be linked with the Federal Drug Administration (FDA), Bureau of Alcohol Firearms and Tobacco (BATF), state agencies, and other on-line sources of legal information to create this database.

[0026] The content management module 300 is a relational database of industry-specific, company-specific or supplier-specific information such as: industry news, documents, inventory alerts, key weather and farming data.

[0027] Suppliers that sell products typically have some sort of catalog, whether it be online or in hardcopy. The catalog management module 400 provides the winery with a consolidated view of similar products across a number of suppliers.

[0028] The process module 500 captures data from various stages of wine production. The captured data can include activity records or lab analyses records. The records allow traceability for audit and regulatory compliance.

[0029] The supplier module 600 provides the ability to manage suppliers and the associated catalog.

[0030] The core module 1000 is the base module for the system 5. The core module 1000 implements the functionalities of the system 5. Functionalities of the core module 1000 include: user management, roles and security management, organization structure management, system administration, functional master, alert functionality.

[0031] FIG. 2 is a diagram conceptually illustrating operation of an embodiment consistent with the present invention

to provide infrastructure that will enable supply chain solutions for regulated industries. The supply chain solution **10** is used with a web-site **12**, which represents one or more applications through which users can engage in worry-free management of their inventory, production, etc. A user with system **22** may interact with web-site **12** on-line (or otherwise) using a web browser **26** communicating through a network connection such as the Internet **16** or other type of network in order to obtain information about the status of their, for example, production.

[0032] FIG. 3 is a block diagram illustrating exemplary hardware components for implementing system **10** for enabling supply chain solutions for regulated industries. System **30** includes a user system **37** having a user machine **38** connected with a network **60** such as the Internet, providing a network connection for participating in IP ordering. Other user systems, such as user system **56** may also be connected with network **60** for obtaining production status. User system **56**, and other user systems, may include the same components as user system **37**.

[0033] Users at user systems **37** and **56** interact with a server **76** to obtain production status information. Server **76** provides and maintains the web site **12** for providing a network connection to the application(s) through which users can obtain and share information. System **30** may also include the ability to access one or more web site servers **58** in order to obtain content from the World Wide Web, if desired. Only two user systems are shown for illustrative purposes only; system **30** may include many user machines and may be scalable to add or delete user machines to or from the network.

[0034] User machine **38** illustrates typical components of a user machine. User machine **38** typically includes a memory **40**, a secondary storage device **50**, a processor **52**, an input device **54**, a display device **48**, and an output device **46**. Memory **40** may include random access memory (RAM) or similar types of memory, and it may store one or more applications **44**, and a web browser **42**, for execution by processor **52**. Secondary storage device **50** may include a hard disk drive, floppy disk drive, CD-ROM drive, or other types of non-volatile data storage. Processor **52** may execute applications or programs stored in memory **40** or secondary storage **50**, or received from the Internet or other network **60**. Input device **54** may include any device for entering information into machine **38**, such as a keyboard, mouse, cursor-control device, touch-screen, microphone, digital camera, video recorder or camcorder. Display device **48** may include any type of device for presenting visual information such as, for example, a computer monitor or flat-screen display. Output device **46** may include any type of device for presenting a hard copy of information, such as a printer, and other types of output devices include speakers or any device for providing information in audio form.

[0035] Web browser **42** is used to access the application(s) through the web site **12** and display various web pages through which the user can collaborate information, and examples of those web pages are described below. Examples of web browsers include the Netscape Navigator program and the Microsoft Internet Explorer program. Any web browser, co-browser, or other application capable of retrieving content from a network and displaying pages or screens may be used.

[0036] Examples of user machines for interacting with the web site **12** include personal computers, laptop computers, notebook computers, palm top computers, network computers, or any processor-controlled device capable of executing a web browser or other type of application for interacting with the system.

[0037] Server **76** typically includes a memory **62**, a secondary storage device **74**, a processor **72**, an input device **70**, a display device **68**, and an output device **66**. Memory **62** may include RAM or similar types of memory, and it may store one or more applications **64** for execution by processor **72**. Secondary storage device **74** may include a hard disk drive, floppy disk drive, CD-ROM drive, or other types of non-volatile data storage. Processor **72** executes the application(s), which is stored in memory **62** or secondary storage **74**, or received from the Internet or other network **60**. Input device **70** may include any device for entering information into server **76**, such as a keyboard, mouse, cursor-control device, touch-screen, microphone, digital camera, video recorder or camcorder. Display device **68** may include any type of device for presenting visual information such as, for example, a computer monitor or flat-screen display. Output device **66** may include any type of device for presenting a hard copy of information, such as a printer, and other types of output devices include speakers or any device for providing information in audio form.

[0038] Also, processor **72** may execute one or more software applications **64** in order to provide the functions described in this specification, and the processing may be implemented in software, such as software modules, for execution by computers or other machines. The processing may provide and support web pages described in this specification and otherwise for display on display devices associated with the users' computers. The term "screen" refers to any visual element or combinations of visual elements for displaying information or forms; examples include, but are not limited to, user interfaces on a display device or information displayed in web pages or in windows on a display device. The screens may be formatted, for example, as web pages in HyperText Markup Language (HTML), Extensible Markup Language (XML) or in any other suitable form for presentation on a display device depending upon applications used by users to interact with the system.

[0039] The screens include various sections, as explained below, to provide information or to receive information or commands. The term "section" with respect to screens refers to a particular portion of a screen, possibly including the entire screen. Sections are selected, for example, to enter information or commands or to retrieve information or access other screens. The selection may occur, for example, by using a cursor-control device to "click on" or "double click on" the section; alternatively, sections may be selected by entering a series of keystrokes or in other ways such as through voice commands or use of a touch screen. In addition, although the screens described below illustrate a particular arrangement and number of sections in each screen, other arrangements are possible and different numbers of sections in the screens may be used to accomplish the same or similar functions of displaying information and receiving information or commands. Also, the same section may be used for performing a number of functions, such as both displaying information and receiving a command.

[0040] Although only one server is shown, system **30** may use multiple servers as necessary or desired to support the users and may also use back-up or redundant servers to prevent network downtime in the event of a failure of a particular server. In addition, although machine **37** and server **76** are depicted with various components, one skilled in the art will appreciate that these machines and the server can contain additional or different components. In addition, although aspects of an implementation consistent with the present invention are described as being stored in memory, one skilled in the art will appreciate that these aspects can also be stored on or read from other types of computer program products or computer-readable media, such as secondary storage devices, including hard disks, floppy disks, or CD-ROM; a carrier wave from the Internet or other network; or other forms of RAM or ROM. The computer-readable media may include instructions for controlling a computer system, such as machine **37** and server **76**, to perform a particular method.

[0041] **FIG. 4** is an example of a regulated industry (e.g., the wine industry) and how not only is the process modeled, but data points such as various records and work orders are fed into an electronic filing system which can automatically generate or electronically file compliance reports and other regulatory documents. Other applicable industries include: food, pharmaceuticals, petroleum, chemical, etc. The process, which is modeled here, is an actual instance whereas the present application can support and be configured for any process flow. Also, the system can be audited in reverse to facilitate in audits by regulatory bodies or for internal needs. The entire process is captured in a web-based software system. In addition, wireless software captures this process in industrial wireless devices.

[0042] The terms and descriptions used herein are set forth by way of illustration only and are not meant as limitations. Those skilled in the art will recognize that many variations are possible within the spirit and scope of the invention as defined in the following claims, and their equivalents, in which all terms are to be understood in their broadest possible sense unless otherwise indicated.

What is claimed is:

1. A system for managing a regulated industry, comprising:

an inventory management module, wherein the inventory management module tracks goods in an industry;

a process module, wherein the process module receives data pertaining to various stages of the industry;

a regulation module, wherein the regulation module processes data relating to regulations governing the industry; and

a core module, wherein the core module is coupled to the inventory management module, the process module, and the regulation module, and coordinates the operation of the modules.

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