GLOBAL ASSET RISK MANAGEMENT SYSTEM AND METHODS

[0001] This application is a continuation-in-part of U.S. Patent Application No. 09/619,245, filed July 19, 2000, the entire disclosure of which is hereby incorporated by reference as if set forth fully herein.

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BACKGROUND OF THE INVENTION

Field of the Invention

[0003] The present invention generally relates to a method and system for providing global risk management products for business and consumer use. The present invention more particularly relates to a method and system for assessing and mitigating risk associated with one or more assets.

Background Information

[0004] Millions of travelers are afflicted with problems each year, problems involving their health and safety, the timeliness and quality of their trip, and their familiarity with their destination. Further, asset managers and security directors must assess and/or mitigate increased risk to assets such as people or facilities caused by a variety of factors such as security threats or transportation issues. These problems cost time, money, and even lives. Whenever a travel problem or threat event occurs, however, typically the information necessary to avoid it, or solve it, is available somewhere, if only the traveler or asset manager had known about it. Thus, there is a pressing need to develop a system which continually monitors the world for pertinent travel-related

information, on the one hand, and on the other hand, delivers relevant information to travelers or asset managers when, where, and how they need to use this information.

SUMMARY OF THE INVENTION

[0005] The method and system of the present invention have met the above-described needs by providing a method and system for the automated delivery of travel information when, where, and how travelers need it.

[0006] The invention provides a method for providing travel-related information to a consumer having a consumer-specific profile. This method includes acquiring information from at least one information source; transforming the acquired information into information pertinent to travel related activities; using rules for applying the transformed travel information to the consumer-specific travel profile; and, creating a product for said consumer indicative of the results of the application of the transformed travel information to the consumer-specific travel profile. A system implementation of this method is also provided in another aspect of the invention. It can be appreciated that the invention can also be embodied in a computer-readable medium.

[0007] In a further aspect of the invention, an information system segment is provided that is structured for use in a system for providing travel related information to a consumer with a consumer-specific profile. This information system segment includes a collection subsystem for obtaining information from at least one data source; an analysis subsystem for filtering the obtained information to identify its travel related characteristics; and, a distribution/storage subsystem for directing the filtered data to at least one portion of the system for providing travel related information.

[0008] It is therefore an object of the present invention to provide, in one aspect, a system based on five elements: a global operations center, which continuously collects, analyzes, and processes information pertaining to travel from at least one information source; a data store for holding the information; a profiling system, for capturing and maintaining traveler profiles; a rules engine for applying rules pertaining to

travel based on the traveler's profile; and a plurality of online products that incorporate and deliver the relevant travel information.

[0009] It is a further object of the invention to provide, in another aspect, a continuous creation of information in an intelligence operations center, and its storage in the data store, to provide travel related information on a plurality of global destinations.

[0010] It is a further object of the invention to provide, in another aspect, a profiling system that captures a traveler's profile, triggers the application of relevant rules (e.g. if the traveler has a respiratory problem, and the altitude of the destination is sufficiently high, then a warning notice will be retrieved), and retrieves pertinent information from the data store.

[0011] It is a further object of the invention, in another aspect, to package travel information in an electronic product and deliver that product in an on-line environment

[0012] It is a further object of the invention to provide, in another aspect, connectivity with an external, global airline reservation system, such that the invention is associated with the act of buying an airline ticket, for example, as well as for boats, trains, and other similar consumer transportation.

[0013] Furthermore, embodiments may include receiving travel intelligence from at least one travel intelligence source, receiving asset information from at least one asset information source, and generating a risk assessment report based on the travel intelligence and the asset information.

[0014] These and other objects of the present invention will be more fully understood from the following description of the invention and by reference to the figures and claims appended hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] A full understanding of the invention can be gained from the following detailed description of the invention when read in conjunction with the accompanying drawings in which:

[0016] Figure 1 is a logical and functional architecture diagram showing an embodiment of the method and system of the present invention;

[0017] Figure 2 is a block diagram of an embodiment of the present invention;

[0018] Figure 3 is a block diagram of an embodiment of the present invention;

[0019] Figure 4 is a flow diagram of an embodiment of the present invention;

[0020] Figure 5 is a flow diagram of an embodiment of the present invention;

[0021] Figure 6 is a system diagram of an embodiment of the present invention;

[0022] Figure 7 is a system diagram of an embodiment of the present invention;

[0023] Figure 8 is a flow diagram of an embodiment of the present invention;

[0024] Figure 9 is a system diagram of an embodiment of the present invention;

[0025] Figure 10 is a system diagram of an embodiment of the present invention;

[0026] Figure 11 is a combined system/flow diagram of an embodiment of the present invention;

[0027] Figure 12 is a system diagram of an embodiment of the present invention;

[0028] Figure 13 is a system diagram of an embodiment of the present invention;

[0029] Figure 14 is a system diagram of an embodiment of the present invention;

[0030] Figure 15 is a flow diagram of an embodiment of the present invention;

[0031] Figure 16 is a flow diagram of an embodiment of the present invention;

[0032] Figure 17 is a system diagram of an embodiment of the present invention;

[0033] Figure 18 is a flow diagram of an embodiment of the present invention;

[0034] Figure 19 is a flow diagram of an embodiment of the present invention;

[0035] Figure 20 is a conceptual flow diagram of an embodiment of the present invention;

[0036] Figure 21 is a system diagram of an embodiment of the present invention;

[0037] Figure 22 is a system diagram of an embodiment of the present invention;

[0038] Figure 23 is a system diagram of an embodiment of the present invention;

[0039] Figure 24 is a system diagram of an embodiment of the present invention; and

[0040] Figure 25 is a functional flow diagram of a global asset risk management system according to at least one embodiment;

[0041] Figure 26 is a flow chart of a global asset risk management method according to at least one embodiment

[0042] Figure 27 is an illustration of a risk assessment determination according to at least one embodiment

[0043] Figure 28 is an exemplary source catalog page according to at least one embodiment;

[0044] Figures 29a and 29b are exemplary general interactive pages showing general details associated with a source according to at least one embodiment;

[0045] Figure 30 is an exemplary comments interactive page showing comments associated with a source according to at least one embodiment;

[0046] Figure 31 is an exemplary metadata interactive page showing metadata associated with a source according to at least one embodiment;

[0047] Figure 32 is an exemplary contact interactive page showing contact information associated with a source according to at least one embodiment;

[0048] Figure 33 is an exemplary source ratings page according to at least one embodiment;

[049] Figure 34 is an exemplary additional intelligence page in at least one embodiment;

[050] Figure 35 is an exemplary reference document page in at least one embodiment;

[051] Figure 36 is an exemplary additional intelligent metadata interactive page showing metadata associated with an additional intelligence source according to at least one embodiment;

[052] Figure 37 is an exemplary additional intelligent ratings interactive page showing source ratings associated with an additional intelligence source according to at least one embodiment; and

[053] Figures 38a and 38b are exemplary pages of a risk assessment report according to at least one embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Travel Information Logical and Functional Architectures

[0054] In the method and system of the present invention, a logical architecture and its corresponding functional architecture are provided that can operate on an Internet-based information exchange medium or another similarly structured and suitable medium. This architecture permits a breadth of information sources from which information related to travel, in particular, can be gathered, transformed and provided to a consumer in the form of a product and/or service.

[0055] As used herein, the term "travel-related information" includes any information which is related to a particular mode of travel or travel destination. As used herein, a "consumer" can be an individual, a plurality of individuals, a company, and/or any other entity that uses travel-related information. As used herein, a "consumer-specific profile" can include any information that relates to a consumer's travel preferences, such as, but not limited to, any one or more of the following: destination, mode of travel, health condition of traveler, travel risks associated with a particular destination, and the like. An "information source" as used herein can be any electronic, written, verbal or other source from which data can be derived. A "product" as used herein can refer to a product and/or a service.

[0056] Referring now to Figure 1, in the form of the invention shown, the method and system of the present invention can be represented as five architectural layers that represent data processing from information acquisition to product/service delivery. In the information acquisition layer 2, information regarding travel can be acquired from information sources 4 such as other Internet sites. In performing the function of information acquisition, these information sources 4 may or may not be partnered with the home Internet site from which travel analysis is delivered to the individual consumer.

[0057] Referring again to Figure 1, in the information transformation layer 6, data retrieved from information sources in layer 2 are processed through at least two

logical steps in the method and system architecture: one is an oversight and advisement step 8 and another is the research and analysis step 10. A functional architecture of the invention corresponding to the information transformation 6 logical architecture can be provided that can be designated as an information validation and recommendations 12 function. The oversight and advisement step 8 can include, for example, processing acquired data through a health information board, performing an advisement function, and developing business rules 14 for treatment of current and future travel data related to health and medicine. The research and analysis step 10 of the information transformation layer 6 can include, for example, applying medical information and epidemiology findings from clinic networks 16 that are researching the status of communicable diseases at a given travel destination. In the information transformation layer 6, data acquired is validated and recommendations for further processing of that acquired data through the travel method and system of the invention are developed.

[0058] Referring again to Figure 1, in the information development/application step 18, business rules, some of which can be substantially continuously and dynamically generated in the oversight and advisement step 8 of the method and system, are applied to the travel data. In this step 18, factors such as health, security and safety business rules 20 are determined and applied relative to the acquired and transformed travel data. In the product/service creation step 22 of the method and system of the present invention, a report is generated 24 for use by a consumer to evaluate a decision regarding travel to a particular country or region of the world. Also, in this step 22, activities such as alert characterization and distribution list development 24 (discussed in more detail hereinafter) are produced and provided as products/services for the consumer.

[0059] Referring again to Figure 1, product/service delivery 26 occurs with regard to providing the travel information to a consumer. In this step 26, the consumer receives desired information regarding travel to and from a particular location of the world. The product/service delivery step 26 can be performed through a variety of suitable delivery channels 28, including without limitation, the Internet, wireless communication media and apparatus, business intranets, kiosks or other virtual and/or

physical locations from which it is desirable for a consumer to request and obtain travel information.

[0060] Referring again to Figure 1, in summary, the functional architecture of the invention is a layered architecture, with five distinct functional layers corresponding to the logical architecture layers. The information acquisition layer 2 includes a unique collection of travel information sources and a robust set of mechanisms for acquiring varied information sources. The information transformation layer 6 includes extract, transform, and load sub-processes, and a unique, external application of expert research and analysis. The information development/application layer 18 includes interactions with subsystems such as alert and event monitoring; extract, transform, and load sub-processes; and external oversight, advisement, and travel business rules development such as by industry experts. The product/service creation/delivery layers 22,26 include content management and global travel information, including workflow, version control, personalization, and content integration; creation of unique, personalized products based on a combination of personalized travel profile information of the global travel information; and a rich and diverse set of delivery channels.

[0061] It can be understood by one skilled in the art that the foregoing logical steps can be applied, for purposes of implementing the method and system of the present invention, to a plurality of functional modules. It can be further understood that the specific functional architecture aspects of the invention described herein are intended to be illustrative, and not limiting, as to the scope of the invention.

Travel Information Technology Implementation Architecture

[0062] In summary, referring now to Figures 2 and 3, the technology implementation architecture of the invention is a descriptive set of a plurality of technology subsystems or segments, each of which can be considered as part of one of several functional systems: collection 32, back office 34, content repository 36, products 38, internet site 40, and distribution 42. Figures 2 and 3 illustrate the relationships between and among these different technology segments.

Content Identification Segment (CIS)

[0063] Referring now to Figure 4, a content identification segment (CIS) (51) relates to the initial and ongoing identification of information sources such as internet sites that enhance the products and services provided by the invention. The CIS (51) also enables the determination of sites in use that should, based on subjective or objective criteria, no longer be relied upon for accurate, timely, or value-added content.

[0064] Content in the invention can be identified by manual methods performed by subject matter experts (SME's) 52 or individuals with domain expertise using public search engines, for example. In another aspect of the invention, once a base set of content sources has been established, an automated robot process 54 can be employed to identify potential sites on a regular basis. To improve their performance, such robot processes can be monitored and reviewed by the SME's 52 on a regular basis with periodic validation of the criteria driving these robots. In general, the robot process begins by returning identified site lists. Refinements can then be added by applying SME-developed context to text returned by these robot processes.

[0065] With this SME-developed context, a high-level classification of the sites returned can be developed. The granularity of robot 54 returns be fairly coarse initially, and more finely grained as identification techniques are honed. Likewise, the levels of classification of robot 54 returns can be limited, with additional levels added as identification techniques are honed. Multiple levels of robot activity can therefore be implemented in accordance with the invention.

[0066] A blanket robot can exist, for example, that combs the web simply for the word "travel," then discards duplicate hits or hits outside of <Title> or <meta> tags Ultimately, these robot processes may evolve to several robot processes that can look for specific occurrences of the word "travel" in conjunction with other words (e.g., "health") in very specific structural elements of the document (e.g., only if both words occur in both the <title> tag and in <meta name = keywords> tag). It can be appreciated that the

robot technology can also be effective for non-HTML sources, provide mechanisms for natural language queries, and can be able to route hit returns substantially automatically to specific SME's 52.

Content Acquisition/Aggregation Segment (CAAS)

[0067] Referring now to Figure 5, in the invention a CAAS (71) defines the processes by which identified content (see CIS (51) discussion above) is acquired and classified as belonging to a specific domain, then stored in a format by which the content management system (see CMS (131) discussion hereinafter) can use.

[0068] The CAAS (71) includes developing agents 72 to retrieve identified content from an information source 74 and implementing a scheduling mechanism 76 to initiate these agents. In general, content acquisition schedules 76 range from completely static (e.g., a single agent initiation for the power requirements in France) to hourly (e.g., a five-day weather forecast for Paris). Notification agents 78 can also be developed and scheduled for initiation at regular intervals. These notification agents 78 can inform content acquisition personnel that a particular content source has changed in content or structure.

[0069] If a relatively simple change in content is indicated, the acquisition agent 72 can be manually initiated to bring in the latest content for a given information source 74. Integration with the Administration Segment (ADMS) (181) (discussed hereinafter) is required for this process, as an initial acquisition agent schedule 76 is sparse until the frequency at which site content changes is understood. If a notification agent 78 returns information on a content structure change, for example, content management personnel can modify the corresponding acquisition agent 72 so that the change content is correctly acquired. In addition, an environment can be created whereby SME's can create ad hoc acquisition and notification agents for alert purposes. In another aspect of the invention, the modification of acquisition agents 72 can be automated and based on the return information of notification agents 78. It can be appreciated, however, that some manual oversight is desirable in this process.

Content Repository Segment (CRS)

[0070] In the invention, the content repository segment (CRS) 91 stores, manages, and distributes substantially all acquired travel information that is considered persistent.

[0071] Referring now to Figures 6 and 7, the content repository can be considered a "hub" for content and data. Although the content repository 91 includes both relational and object XML data stores 92, it can be accessed and managed through a central mechanism and driven by a single engine 94. The content repository 91, as shown, can provide facilities to store, view, import, organize, modify, export, and query travel-related information. It can include one or more physical data stores 92,96,98,100,102,104,106; the data engine 94; an integrated tool set for development; and, a centralized management facility 108.

[0072] It can be appreciated, in an alternative aspect of the invention, that the content repository 91 could support extended data types including user-defined types and extended data types of audio and video. The content repository 91 can also include portions of the application of business logic in the data model.

[0073] In one embodiment of the invention, the content repository comprises several technological components. A component environment is a dedicated content object layer. An application server 93 is provided that stores and processes data access/storage components 95. Services are enabled with Java Database Connectivity (JDBC) and open database connectivity (ODBC) drivers. An object request broker (ORB) is also employed (an object request broker) to manage object-to-object messaging and inter-ORB communications. The XML object engine 94 stores/retrieves XML objects from data stores 92,102,104 and has functionality based on schemas stored in a data map store 102. An XML parser 110 is included that checks syntactical correctness of schemas in the data map store 102 and ensures the formation integrity of incoming XML objects. An object processor 112 is included as a component to physically store XML data in the

XML store 92. A query interpreter 114 resolves XML Query Language (XQL) requests and interacts with the object composer 116 to retrieve XML objects according to the schema stored in the data map store 102. The object composer 116 is provided to construct the information objects, based on storage and retrieval rules defined in the data map store 102, and return them as XML documents. There are also various utilities in this embodiment, including those that support directory and tree-oriented loading of XML objects. An external storage integration component (ESIC) (118) permits applications to access data regardless of database type or location.

[0074] The data map (meta data) store 102 serves as the content repository's 91 knowledge base. The data map store 102 contains the schemas that hold the rules according to which XML objects are stored and composed, such as: (1) storage and indexing of XML objects within the content repository, (2) mapping of data to different data structures to enable the integration of existing data, and (3) executing user-defined application logic with a server extension function associated with an object. An SQL engine 120 manages an internal SQL store 104; executes SQL statements; and, accepts SQL statements in a number of ways: internally, from the object engine 94; from applications, which can be either embedded or through standard database interfaces such as ODBC (122), JDBC, or OLE-DB (124); and, from the content repository manager 108. The CR manager 108 provides an administration tool implemented as a graphical user interface (GUI) that runs in standard web browser. In addition, server extensions permit user-defined functions to be incorporated into the content repository 91.

Content Management Segment (CMS)

[0075] Referring now to Figure 8, in the form of the invention shown, a content management segment CMS (131) can be defined by the processes and technologies by which content is managed. Content management technologies include content and design control, contributor/user access control, site control, asset control, publication, and workflow. A universal (i.e., generic) presentation format can be developed, along with XML document schema, and content binding to page layouts can be implemented.

Substantially all content, including text, graphics, styles, themes, and other assets, can be stored as objects in a high-performance relational database. For performance reasons, all content provided by the invention, as presented to a content consumer, comprises static pages in flat file systems. This content can be dynamically generated on an as-needed basis (e.g., one particular page every minute, one particular subset of pages every week, and the like).

[0076] After initial implementation, interaction with ADMS (181) and CRMS determines style and design modifications. In another aspect of the invention, implementation of ancillary services such as advertising management and syndication mechanisms can be incorporated into the invention. It can be appreciated that content can be translated and global sites can therefore be developed in English, Spanish, German, French, Japanese and other suitable languages to which the invention can be adapted.

Travel Information Report Segment (TIRS)

[0077] Referring now to the figures, in another embodiment of the invention, a travel intelligence report (TIR) can be generated that includes trip information necessary to make informed decisions regarding pre-travel preparation and enhancement and enjoyment of travel related activities. In one aspect of the invention, the TIR can be divided into four major sections: Pre-Trip Information, Destination Information (for one or more destinations), General Advice, and Products and Services. Within each section is a set of information categories, each of which contains several information requirements. Each of these requirements can be customized to (1) the traveler, based on his/her personal profile, (2) destination, and (3) related issues such as season of travel.

[0078] The Pre-Trip section travel categories include Alerts, Entry/Exit Requirements, and Pre-Trip Health considerations. Alerts may include, but are not limited to, Safety/Security, Weather, and Transportation. Entry/Exit Requirements can include all legal, health, and custom issues that are important for entering and leaving a particular destination. The Pre-Trip Health section can also include required and recommended immunizations, health risk considerations, and the like.

[0079] Typical travel categories and information requirements in the Destination section includes, but is not limited to:

[0080] 1. Safety/Security: Social Stability, Crime, Airline, Game Parks

[0081] 2. Weather/Environment: Climate & Terrain, Natural Risks, Environment, Weather Chart & Forecast

[0082] 3. Transportation: Air Travel, Water Transportation, Road/Overland Travel, Taxi, Mass Transit, Train Travel, Rental Cars

[0083] 4. Money: Cash & Credit, Taxes, Cost of Living

[0084] 5. Telecommunications: Phone/Electric, Internet, Contact Information, Mail, Radio

[0085] 6. Social Customs: Behavior, Religion, Women's Issues, Business Hours, Public Holidays & Events

[0086] 7. Legal: Prohibited Items, Penalties

[0087] 8. Language: Official Language

[0088] 9. Health: immunizations, nearest hospital, health insurance, health risks

[0089] One feature of the TIR is that it can be a hyperlinked report. Consumers have the ability to expand or contract particular information requirements to see detail or concise descriptions for a given TIR, information which has come directly from the global operations center. The TIR can be printed directly from a browser, or saved in a variety of electronic formats, but it is also "alive" in the sense that a traveler can return to it online at anytime up to thirty days after the conclusion of his trip and access the latest information based on his profile. In fact, if an alert level event occurs during the life of the report it will trigger the transmission of an e-mail (or other push technology) warning

from the report to the traveler. In this way the report, and the operations center behind it, become the traveler's own personal intelligence agency.

[0090] The TIR can also include a rating (such as from 1 to 5 in tenth increments, for example), which is a weighted-average of the total risk of the trip represented by the TIR as determined by criteria applied to the travel data in the TIR. This rating can be illustrated, for example, by a series of "jet" graphics printed on the TIR.

Member Personalization Segment (MPS)

[0091] Referring to Figures 9 and 10, a member personalization segment (MPS) (151) defines the functions and processes by which the products and services of the invention are personalized to a specific consumer. In addition to personalization of product/service offerings, the MPS (151) provides a mechanism to apply targeted marketing to the travel community.

[0092] The MPS (151) includes, for example, the following information: static, stored personal information; name recognition 152; and, user-provided information 154. In one aspect of the invention, a personalization business rules engine 156 interacts with this information, along with input from business rules frameworks applied to ISS (351). It can be appreciated that the information sophistication level can increase to provide the following processes: content consumption measurement 158; adaptive content and navigation; predictive modeling 160; segmentation; and behavioral personalization

Billing Segment (BIS)

[0093] Referring to Figure 11, a billing segment (BIS) (171) can be employed to define the billing and payment architecture for products and services provided by the invention. The BIS (171) can be associated with the TIR's and channel partners (e.g., e-Ticket TIR). Billable activity can also be captured within the distribution segment (DIS)

(190) then routed to BIS (171) and CR5 (91) (for updating partner detail records and consumer detail records.

[0094] In one aspect of the invention, BIS (171) includes, for example, the following functionality: rules-based messaging to tailor invoicing for specific partners; e-mail based invoice presentation, with a secure uniform resource locator (URL)-link back to the invention internet site for invoice details; a comprehensive customer-care system for issues such as dispute management; an ability to implement prearranged payment plans; and, flexible payment processing, including payment returns and payment confirmation. It can also be appreciated that credit card payments can be accommodated by the invention.

[0095] In another aspect of the invention, a cost model for alerts can be determined based on factors such as (1) alert level, (2) number of delivery channels, and (3) type of delivery channel.

[0096] With regard to syndication of content, a cost model can be developed for the invention to accommodate granular syndication requirements For example, one partner may choose to syndicate the entire invention content, while another partner may choose a vertical (e.g., information requirement) or horizontal (e.g., geographical) subset to such syndication Also related to CMS (131) are the requirements associated with localization. For example, if a channel such as the internet site of the invention is localized for a foreign country, currency considerations are an important consideration.

[0097] In another embodiment of the invention, to satisfy these additional requirements, a multi-service BIS (171) considers the following: volume tiering, discounting, multi-format invoicing, billing-on-demand (including threshold, activity-based, and billing in advance), and direct debit processing. In an alternative embodiment of the invention, the billing function can be out-sourced to a service provider.

Administration Segment (ADMS)

[0098] Referring now to Figure 12, an administration segment (ADMS) (181) defines the administration and reporting necessary to maintain a robust, active set of systems and a proactive approach to determining return on investment (ROI) on system processes. Management of the systems of the invention can take place internally such as by personnel, externally by the INFS provider, and/or externally by a management service provider 182.

[0099] Internally, structured reports are used to measure ROI of several processes, including internet site analysis (navigation, content consumption, activity paths, and the like) and content acquisition ROI. Ad hoc mechanisms 184 can be used for targeted data mining and analysis. Key elements of this internal reporting mechanism are the determination of content acquisition cost vs. content use (i.e., ROI of destination-specific products).

[0100] Externally, base operating system (OS)-level functionality can be managed by collocation INFS partner(s). This functionality includes security, redundancy, load balancing, and the like. By placing a management service provider client 186 between the invention's internet site application services 188 and the DIS (190), one can also manage process, transaction, and infrastructure issues.

[0101] In addition, a plurality of metrics can be captured and analyzed. Process metrics include end-to-end transaction response times, actual transactions: target transaction ratio, start-to-finish transaction ratios for key business processes, availability or service level agreement (SLA)-ratios of partners Transaction metrics can include activity response times, including product (e.g., TIR's, EAS (201)) production and distribution, session ID transaction information, performance based on volume of product creation/distribution, replication updates per unit time (including product, email, etc.).

[0102] Infrastructure metrics can include web server metrics, including connection rates, connected users, data transfer rates, and number of connections, database metrics, including database transactions, file sizes, deadlocks, memory cache hit ratios, memory optimization, user logins, logout rate, and user connections; and, server

metrics, including packet traffic, queue size, disk and memory utilization, and session errors.

Event/Alert Segment (EAS)

[0103] Referring now to Figure 13, an event/alert segment (EAS) (201) is responsible for the identification, selection, management, and distribution definition of events and alerts. The EAS (201) can support both manual and automated systems. The manual systems permit an Analyst, for example, to generate an Alert and forward it to the EAS (201) for processing. The EAS (201) can process an Alert by queuing it in priority order to a selection system operated by an Event Reporting Analyst. Alerts are reviewed to ensure that the system does not flood the distribution network with low grade or otherwise relatively insignificant Alerts. The Analyst can modify both the Alert content and attributes (duration, region of interest, level, and the like). An Alert can be sent back to one or more designated Analysts for review and comment as a high priority message. Once the Event Reporting Analyst releases an Alert, the EAS (201) determines the applicable members and establishes the distribution orders for the Alert. This information is passed to the Distribution Segment (DIS) (190) to perform transmission of the Alert to various distribution networks, such as by pager, e-mail, and other suitable communication avenues.

[0104] In another aspect of the invention, automated systems can be deployed that perform keyword spotting and category analysis to identify potential candidate content for Alert generation. Keyword spotting involves scanning incoming content for specific keywords or combination of keywords using regular expression analysis defined in a Keyword Dictionary. Examples of such keywords for Alert reporting are "hurricane", "strike", and the like. Other keywords would include specific names of countries, airlines, and the like.

[0105] Once keywords are identified, Category Analysis is used to determine who should review the content. For example, a message with "France", "United" and

"strike" could be automatically routed to the European Desk Analyst and the Transportation Domain Expert as "high priority" content for review.

[0106] The method and system of the invention addresses the need to provide multiple Event Reporting Analysts as a role. This role can be passed from shift to shift, and there can be multiple Event Reporting Analysts operating concurrently. If there are multiple Event Reporting Analysts operating, the system can maintain a single, global work queue but resist multiple Event Reporting Analysts from working the same Alert simultaneously.

[0107] An important aspect of this embodiment of the invention is the ability to identify, review and select events for Alert reporting. Alerts can have, for example, three (3) levels of significance A Level 1 - High Priority/Critical Alert could be considered one that can directly impact the health, safety, or schedule of the traveler. Examples of Level 1 Alerts could include weather alerts, flight delays and cancellations, actual strike actions, and the like. A Level 2 - Medium Priority/Warning Alert relates to information that may have an impact on the health, safety or schedule of the traveler Examples of Level 2 Alerts include imminent weather conditions, strike advisories, social unrest, airport facility issues, and the like. A Level 3 - Low Priority/Informational Alert is related to information that the traveler should be aware of about his/her trip. Examples of Level 3 Alerts can include major events being held at a given destination, financial situations such as money valuation issues, visits of a major head of state, and the like.

[0108] In another aspect of the invention, the EAS (201) technology is a subset of ISS (351) technology (discussed hereinafter).

E-commerce Segment (ECS)

[0109] Referring now to the figures, an e-commerce segment (ECS) of the invention provides the consumer with the opportunity to purchase travel associated products, that can be appropriately matched with the consumer's travel itinerary and profile. The ECS can be implemented as conventional hyperlinks at the end of a TIR:

these links can be generic and/or targeted to the consumer based on predetermined criteria (e.g., season, destination country). These links are preferably only linked to the source provider for the product.

[0110] In another aspect of the invention, targeted contextual e-commerce can also be implemented on the TIR. This contextual e-commerce can be member profile-specific and combined with trip specifics to recommend particular products to the consumer. The consumer can then be linked and transacted through specific channels of the internet site for the invention. It can be appreciated that, instead of dedicated e-commerce platforms being incorporated to implement this type of e-commerce, content agents from CAAS (71) can be used, along with the BIS (171), to achieve this level of e-commerce. This contextual e-commerce can be combined with the internet site of the invention, such as on the personalized "My" internet site section. In addition, the internet site of the invention can employ order fulfillment as a function and service for the consumer.

Customer Relationship Management Segment (CRMS)

[0111] A customer relationship management segment (CRMS) (221) of the invention relates to interaction among consumers, site users, and internet site customer service. The CRMS (221) provides a forum in which site users can correspond with a central point of contact (POC) for providing comments and suggestions on products and services provided by the internet site. This feedback can be provided by conventional e-mail links and toll-free telephone numbers, for example.

[0112] The CRMS (221) is a virtual contact center, with workflow, routing, queuing, automated e-mail return, single-click email response, and the like. Incoming requests can be automatically comprehended and classified using message content. A response can be automatically composed with an appropriate reply and data can be retrieved to complete and personalize the response. Responses can then be either automatically sent or routed to a review agent or agents who can then send them to the consumer after examination.

[0113] In another aspect of the invention, a web-based self-service solution can be implemented that recreates the experience of working with an expert customer service representative.

[0114] In addition, an online community can be established by developing discussion forums and a comprehensive knowledge base. In connection with this knowledge base development is a process whereby content suggestions are automatically routed to SME's for analysis and inclusion in the content store.

[0115] In another aspect of the invention, CRMS can also include targeted feedback campaigns and e-mail solicitations. The CRMS can be integrated with the ADMS (181) (for metrics relating to customer activity, retention, and referrals), the MPS (151) (to provide customer-provided input and behaviors for personalization), the MOIS (261) (for establishing additional marketing opportunities), the BIS (171) (for billing customer care), and the PRMS (241) (to share technologies and processes) Live person type support can also be out-sourced after a predetermined number of inquiries are noted.

Partner Relationship Management Segment (PRMS)

[0116] Referring now to Figure 16, in the invention, a partner relationship management segment (PRMS) (241) can encompass both partner lifecycle management and extended enterprise selling. The PRMS (241) can be centered on CHAMPS (Channel and Alliance Management Process) 242 and can concentrate on two areas. Initially, partner lifecycle management can be implemented. This can include partner profiling, partner recruitment, and partner performance monitoring. Integration with MOIS (261) and ADMS (181) is important to implementing this segment

[0117] Enterprise selling can also be addressed. This can include lead assignment, lead distribution and tracking, pricing/quoting, and literature fulfillment. Integration with BIS (171), MOIS (261), and ADMS (181) can be required, as billing customer care and consistent forecasting and reporting can be used:

[0118] • Lead Assignment - Assigning qualified leads to the right partners at the right time is an important task. Managers can graphically enter business rules for building "decision trees" that decide which partner is assigned each lead. Rule options can include, for example, named accounts, score and qualification-based assignment, and checking to see if a partner is working on another lead in the same account. Multiple lead decision trees for different business models can be supported, as well as optional manual assignment, and lead posting to a pool of partners.

[0119] • Partner Profiling - Information contained in the partner profile database can enable distributed management of users, customized content, push delivery, and online partner recruitment. This database can store profiles for both individual partners and partner organizations. An organizational profile can include information such as industry focus, location, organizational structure, product authorized to sell and accounts serviced. Individual profiles cover, for example, contact information, certification level, and previous performance.

[0120] • Channel Partner Recruitment - A challenge for channel managers is the need to recruit qualified channel partners. Channel partner recruitment provides a set of tools to facilitate this recruitment process. Channel managers are able to modify their partner qualification criteria according to the existing partner profiles as well as the current organization needs. Potential partners can be tracked through the recruitment process and analysis can be conducted to determine the optimal way to attract the maximum number of qualifying partners.

[0121] • Channel Communication - Channel communication can be based on two libraries: a distribution list library and a campaign template library. The distribution lists can be created from the partner database and are able to be filtered by type of partner, level of partner, or other criteria. Lists can be saved (either as a description or as a list of actual partners) and used for future campaigns. The campaign library can allow the marketing user to create new items, such as product announcements or event reminders, based on standard designs. Once the literature is created, the system

can then distribute the item to the desired distribution list. Recipients' profiles can be automatically updated to note the information received, and the system monitors and reports on responses.

[0122] In an alternative embodiment of the invention, PRMS (241) activity can be coordinated with suitable marketing or sales out-sourcing partners.

Distribution Segment (DIS)

[0123] Referring now to the figures, the distribution segment (DIS) (190) is responsible for taking a distribution order and executing it. A Distribution Order can include the item to distribute (i.e., Alert, TIR, etc) and where to distribute it (i.e., list of e-mail addresses, pager numbers, etc.). The DIS (190) can parse the distribution order and forward it in portions to various distribution systems. These distribution systems can include e-mail, pager, facsimile, wireless, and the like.

[0124] The DIS (190) provides advantages with regard to error handling. If a transmission fails, for example, the invention provides a way to link this information back to the consumer's profile with an explanation of why there was an error. For example, status = XMIT ERROR, "invalid e-mail address: paul@ijet.com".

[0125] In another aspect of the invention, the DIS (190) can include an interactive voice response (IVR) capability. Using an IVR System, for example, a member can dial a telephone number (800, 900 or direct) and enter his/her member number and personal ID number (PIN) security code to gain access to his/her account. Using the IVR System and a series of selection options, the member can retrieve Alerts, TIR updates, etc. For example, "Press 1 for Alerts", "Press 2 for a TIR Update", "Press 3 for Options", "Press 4 for a Person", etc. If the member presses "1", the system can move to a second level, dynamic menu of options based on the active Alerts for the member. The Alerts can be listed in priority order with unread Alerts prioritized first. The system can, for example, list the Alerts "Press 1 Air Canada Strike", "Press 2 Snow Storm Hits Montreal", and the like. The member can select an entry at any time without listening to

the entire list. By entering a selection, the system can read the selected entry. The member can select Back, Next, Pause, or Replay at any time while the message is being played.

Marketing Opportunity Identification Segment (MOIS)

[0126] Referring now to Figure 18, a marketing opportunity identification segment (MOIS) (261) of the invention shares the technology base of the CIS (51) and conducts the initial and ongoing identification of sites that present marketing and partner opportunities. In one embodiment, once a base set of marketing opportunities has been established, an automated robot process can identify additional potential opportunities on a periodic basis. The robot process can be monitored and reviewed by marketing personnel on a periodic basis, and the criteria which drives these robots can be periodically validated.

[0127] This robot process can return identified opportunity lists. Refinements can be added by applying marketing-developed context to returned text. With this marketing- developed context, a high-level classification of the sites returned can be developed. The granularity of robot returns can be fairly coarse initially, and more finely grained as identification techniques are honed. Likewise, the levels of classification of robot returns can be fairly limited or have additional levels added.

[0128] In another aspect of the invention, multiple levels of robot activity can be implemented. A blanket robot can be employed, for example, that searches the internet for the word "travel," then discards duplicate hits or hits outside of <Title> or <meta> tags on internet sites that are searched. Another robot process can be utilized that looks for specific occurrences of the word "travel" in conjunction with other words (e.g., "booking") in specific structural elements of a searched site (e.g., only if both words occur in both the <title> tag and in <meta name = keywords> tag). Such robot processes can also be applied to non-HTML sources, can provide mechanisms for natural language queries, and can automatically route hit returns to marketing personnel or out-sourced marketing/sales organizations affiliated with the internet site of the invention.

[0129] In an another embodiment, MOIS (261) information can be funneled to out-sourced sales and marketing resources and/or the PRMS (241).

Yellow Book Online Segment (YBOS)

[0130] Referring now to Figure 19, in another aspect of the invention, the yellow book online (YBO) (281) can be provided as a segment including an electronic version of the CDC's Health Information for International Travelers. The YBO (281) can be a verbatim translation of the print version, with a full-text search and retrieval mechanism. In another embodiment, the YBO content can be syndicated to other internet sites via the use of a direct search link to the YBO (281) on the internet site or through a content window displayed directly from the internet site.

[0131] In another aspect of the invention, further employment of the YBO (281) can include enhanced input conditions for a search (e.g., full-text search only on a specific country) and enhanced output (e.g., optional summaries of page "hits"). The Yellow Book Online will provide the core health information for the system.

Web Segment (WEBS)

[0132] Referring now to Figure 20, a web segment (WEBS) (301) of the invention as shown represents the situation where the internet site is a distribution channel for its content, products and services.

Technology Infrastructure Segment (INFS)

[0133] Referring now to Figure 21, in another aspect of the invention, an infrastructure segment (INFS) (321) is provided that includes an operations center and a staging center along with a collocated site in, for example, the United States, Europe, Africa and other suitable international locations. In this embodiment, the primary information activity occurs at an internet site headquarters 322 with an operations center

324. This information activity can then be staged to a staging center 326, and then replicated to one or more of the collocated sites 328,330,332.

[0134] In another aspect of the invention, an archive center 334 can be created at the internet site headquarters. This archive center 334 can store all travel information activity, including historical, administrative, and metric data. This archive center 334 can also be integrated with the ISS (351) so that business information mining and new product creation can be supported.

[0135] It can be appreciated that these collocation services can be top-tier, including caching network operations and RAIS (redundant array of independent systems) in a load-balanced environment. Services can include, but are not limited to, the following:

- Bandwidth Services
- Multi-line local area network (LAN) Connection
- Reporting Services
- Proactive, Multi-Channel Notification
- Bandwidth Reports
- Network Caching
- Managed Monitoring Services
  - Network Monitoring
  - URL Monitoring
  - Reboot Service
- Multi-path Services
- Data Vault Services
- Security Services
  - Intrusion Detection
  - Vulnerability Analysis
  - Managed Firewall

Information System Segment (ISS)

[0136] In one embodiment of the invention, an information system segment (ISS) (351) has three functional subsystems: Collection, Analysis, and Distribution/Storage.

[0137] In the invention, the Collection subsystem centers on an analyst or SME who has domain or geographic expertise. Standard content feeds for his/her domain are substantially continuously being examined, as is existing content in the CRS (91). In addition, more focused content is captured by ad hoc queries through both the CIS (51) and the CAAS (71). These queries can be run through a machine translator prior to content acquisition if specialized, foreign language content resources are presented as information sources. In addition, based on return set content, machine translators can also be used prior to CRS (91) storage. Analysts/SME's can also use an RSS Aggregation Module. This module can allow each analyst/SME to develop his/her own, personalized set of headline content that can be scanned on a regular basis.

[0138] The CRS (91), outside of its standard data structure, has pre-applied templates that ensure the validity of information returned in analyst/SME queries. These templates are in the form of rules frameworks that are defined by partners such as a Health Information Board (HIB). The Collection subsystem relies on the interfaces between CRMS, PRMS (241), and MPS: Partner and Member activity history and itinerary information can contribute greatly as a background to information activity. Also key to the Collection subsystem is a collaboration network that the analyst/SME participates in with other analysts/SME's. Using the collaboration network, queries and return sets can be analyzed by more than one analyst/SME to ensure validity.

[0139] In the invention, the Analysis subsystem operates with a marshaled query on information returned by the Collection subsystem. Such queries can be done, for example, by using meta data searches, with On-Line Analytical Processing (OLAP) tools, or using conventional pattern recognition technologies. Return sets from these initial analysis queries are filtered through two pipes: a filter pipe and an index pipe. The filter pipe applies semantics to incoming signals based on meta data associated with them. If this approach is unsuccessful, semantic application can be attempted based on content. Feature extraction can next be performed to ensure that any semantic application considers multi-semantic issues. The index pipe attempts to index incoming signals based on keywords, thematics, and hierarchical clustering.

[0140] At least two key elements are associated with the filter and index pipes The first is operational qualification agents. These agents capture specific, pre-determined linguistic patterns and can be event-based or schedule-based. Once an operational qualification agent captures a signal, the signal is classified and moves on through the system without proceeding through additional filtering and indexing.

[0141] Both the filter and index pipes are dynamic mechanisms, which are not only modified manually, but "learn" through the application of an analysis engine. This analysis engine is a network of adaptive fuzzy feature modules (AFFN's) that collectively comprise an adaptive temporal correlation network (ATCN). AFFN 's and ATCN's provide managed artificial information and capture patterns and correlations between linguistic elements that are either too time-intensive for humans to capture or practically impossible without computational assistance.

[0142] Once a signal has morphed into an information block (i.e., it has some classification associated with it), the block itself can be considered information or, in the case of misclassification, remain information without attached semantics. At this point, the analyst/SME either validates the information or adds semantics to the information. This can be done through using the information block as input to additional mechanisms in the Collection subsystem, or using the collaboration network and additional analysts/SME's to reach a consensus.

[0143] In the invention, aggregated information is classified again as supplemental content or as an alert If it is classified as supplemental content, the aggregated information is forwarded to the CMS (131), where the content manager filters it through an editorial process. At this point, the supplemental content can be discarded, accepted as is and sent to the CRS (91), or sent back to the analyst/SME for additional analysis If the aggregated information is classified as an alert, it is sent to an alert framework; along with its meta data. Additional meta data is assigned (e.g., data/time, GIST, alert type) and then concomitantly sent to CRS (91) and distribution list · development.

[0144] In summary, the method and system of the present invention offer a travel information functional architecture that defines and supports gathering, analysis, storage, and personalized product/service delivery of accurate, comprehensive, and personalized travel information. The method and system of the invention provide a breadth and richness of information sources and acquisition, sophistication of external oversight, advisement, and business rule development processes applied to travel information development, diversity of product and delivery mechanisms, and a comprehensive application of supporting business and technology architecture. The result is an online intelligence agency that both feeds into and is driven by the global airline reservation system.

[0145] The following example is intended to be an illustration of certain embodiments of the invention and is not intended to limit the scope of the invention:

An Example of the Travel Information System

[0146] The travel information system operates in three distinct phases.

[0147] In phase one, information is collected from online sources and analyzed by regional analysts. These analysts screen the information, iron out discrepancies, edit and format the information, and send it to the data store.

[0148] In phase two, a traveler enters the system through one of many distribution points in the travel industry. An example would be a traveler who decides to purchase a Travel Intelligence Report (TIR) while purchasing an airline ticket from a travel web site. After purchasing the ticket, the traveler is presented with an online profile form, which is already populated with the traveler's client record and e-ticket information, forming the core profile; he can either accept this profile with a single click, or supplement it with more information. In either case this profile form is transmitted online to the internet site, where it triggers the application of appropriate rules, and the retrieval of pertinent content from the data store.

[0149] In the third phase, this content is then assembled into a TIR and delivered to the traveler. The traveler can then print and/or download the TIR. At any point up to 30 days after his return the traveler can also pull up the report online and view the latest version. If any significant changes occur to the underlying information, the report e-mails the traveler. In addition, if the traveler has purchased a separate wireless alert product, the traveler can be notified on his wireless platform.

Global Asset Risk Management

[0150] Figure 25 is a functional block diagram of a global asset risk management system 400 according to at least one embodiment. Referring to Figure 25, the global asset risk management system 400 may include at least one travel intelligence source 401 and at least one asset information source 402. The travel intelligence source(s) 401 may include the CIS 51 and CAAS 71, or the intelligence or information associated with the CIS 51 and CAAS 71, as described herein. For example, the travel intelligence source(s) 401 may include a notification of an event or evolving security situation that creates an increased risk for nearby assets. In an embodiment, the asset information source 402 may include company proprietary asset information such as, for example, but not limited to, geographic location information for company employees or facilities. In at least one embodiment, the geographic location information may include an objective set of coordinates identifying the location of the asset(s) (e.g., facilities, office locations, or personnel). For example, the geographic location information may include the current or a recent set of Global Positioning System (GPS) coordinates. Furthermore, the geographic location information may include the current or a recent set of coordinates from a Geographic Information System (GIS)

[0151] An analysis engine 403 may receive intelligence or information from the travel intelligence source(s) 401 (e.g., Source A) and the asset information source(s) 402 (e.g., Source B). In an embodiment, the analysis engine 403 may correlate the intelligence information (e.g., Source A) with the asset information (e.g., Source B) to determine if one or more assets is proximate to an intelligence event that could impact the

security, health, freedom of movement, or otherwise adversely affect the environment in which the assets operate. If so, the analysis engine 403 may produce a risk assessment report 404 by, among other things, mapping or correlating travel intelligence with asset locations. In at least one embodiment, the analysis engine 403 may be as shown and described with respect to Figures 3, 7, and 23.

[0152] In an embodiment, the global asset risk management system 400 may assign one or more geocodes to an intelligence related event to aid the analysis engine 403 in rendering the determination. The geocode for an intelligence event may include informational elements including, but not limited to, the intelligence category to which the event is assigned, the geographic coordinates of the epicenter of the event (e.g., latitude and longitude coordinates), and a threat perimeter for the event. Thus, each combination of the elements comprising a geocode represents a unique geocode for an event, and an event may have more than one associated geocode (e.g., different threat perimeters). The threat perimeter may be of any shape such as, for example, circular, elliptical, regular polygon, or irregular polygon.

[0153] In at least one embodiment, the risk assessment report 404 may be a data set illustrating the vulnerability of an asset or assets in the context of an intelligence event (e.g., threat). By providing the user with an indication of the asset vulnerability in the context of the threat posed by an intelligence event, the user is able to ascertain the risk to the asset and take appropriate mitigating action. The risk assessment report 404 may be a visual output to a user via text, graphics, or a combination thereof. The risk assessment report 404 may further include one or more electronic messages in combination with the output. The risk assessment report 404 may be output to the user, for example, via hardcopy printout, computer terminal display, or mobile device display such as a Liquid Crystal Display (LCD).

[0154] Further, in an embodiment, the global asset risk management system 400 may provide a risk mitigation toolbox 405 to assist an asset manager, or a person or group who is responsible for the asset at risk, to counteract and/or respond to the increased risk environment. The risk mitigation toolbox 405 may include one or more tools that serve to provide the asset manager with information, which may include intelligence or intelligence related information, useful in mitigating the increased risk

environment for the asset. Examples of such tools include, but are not limited to, references to one or more documents specifying security response procedures, policies or procedures to be implemented in response to particular security threats, and the like. In an embodiment, instead of a link or reference to the document(s), an electronic copy of the document(s) may be made available for download by the asset manager using, for example, a computer equipped with a web browser. Other tools may include a notification system for disseminating travel intelligence or security related information and additional information regarding the asset(s) at risk.

[0155] Figure 26 is a flow chart of a global asset risk management method 500 according to at least one embodiment. Referring to Figure 26, a method 500 may commence at 505 and proceed to 510 and 515. At 510, a method may include receiving travel intelligence from at least one intelligence source. At 515, a method may include receiving asset information from at least one information source. The travel intelligence source(s) 401 may include the CIS 51 and CAAS 71, or the intelligence or information associated with the CIS 51 and CAAS 71, as described herein. In an embodiment, the asset information source may include company proprietary asset information such as, for example, but not limited to, geographic location information for company employees or facilities. In at least one embodiment, the geographic location information may include an objective set of coordinates identifying the location of the asset(s) (e.g., facilities, office locations, or personnel). For example, the geographic location information may include the current or a recent set of Global Positioning System (GPS) coordinates. Furthermore, the geographic location information may include the current or a recent set of coordinates from a Geographic Information System (GIS).

[0156] Control may then proceed to 520, at which an analysis engine may determine one or more impact areas for an event based on the intelligence or information received from the travel intelligence source(s) and the asset information source(s). In an embodiment, this may include correlating the intelligence information with the asset information to determine if one or more assets could be impacted, in terms of security, health, freedom of movement, or otherwise adversely affected, by the occurrence or non-occurrence of a particular event, at 525. In an embodiment, the method may include assigning at least one geocode to an intelligence event to aid the analysis engine in

rendering the impact assessment determination. If the analysis engine determines that one or more assets could be at increased risk due to an event, control may proceed to 530 at which the global risk management may produce a risk assessment report. In an embodiment, the increased risk may be reflected by assigning a correspondingly higher risk rating to the affected asset(s).

[0157] Figure 27 is an illustration of a risk assessment determination or report 600 according to at least one embodiment. As shown in Figure 27, this determination or report 600 may include identifying an impact area 604 associated with an intelligence event that is categorized as a critical alert. Each such critical alert may be assigned an epicenter 603. A map 601 may include an indication of a one or more asset locations 602 that could be affected by the increased risk environment based on, among other things, the asset being within one or more impact areas 604 associated with the epicenter of a critical alert 603. In an embodiment, multiple categories of impact areas 604 may be provided such as, for example, but not limited to, a transportation impact area or a security impact area. Other categories are possible. In at least one embodiment, the risk assessment report 600 may be output to a user, such as a risk manager or security director, in the form of a visual interactive page that may be displayed using a web browser of a computing or communications device. Alternatively, the risk assessment report 600 may be output via hardcopy print media.

[0158] Returning to Figure 26, control may then proceed to 535, at which a method may include providing a risk mitigation toolbox to assist an asset manager, or a person or group who is responsible for the asset at risk, in responding to the increased risk environment. Examples of such tools include, but are not limited to, references to one or more documents specifying security response procedures, policies or procedures to be implemented in response to particular security threats such as evacuation plans, maps of facilities, and the like. In an embodiment, instead of a link or reference to the document(s), an electronic copy of the document(s) may be made available for download by the asset manager using, for example, a computer equipped with a web browser. An example of an document provided by the risk management toolbox is shown in Figure 35.

[0159] Other tools associated with the toolbox may include a notification system for disseminating travel intelligence or security related information and additional

information regarding the asset(s) at risk. The notification system may send a notification to an asset manager or to personnel affected by the event using a variety of communication media. The personnel who receive the notification may be pre-defined and stored by the system. The notification system may further review responses received in reply to a notification message to confirm successful notification delivery. In an embodiment, the notification system may assign different response categories to indicate notification transmission, notification receipt, and confirmation response. In at least one embodiment, the notification system may send notification messages according to a set of business rules. The business rules may include an escalation mechanism for ensuring that a critical alert is received by an asset manager, security director, or other individual or organization responsible for managing the asset(s) at risk. For example, if a notification is sent via e-mail and no confirmation response is timely received, then the escalation mechanism may automatically prompt the system to send the notification using a different communications channel or media for business continuity, such as, for example, triggering a telephone call to the e-mail recipient to ensure her receiving the notification. Multiple levels of escalation using a variety of communications media may be provided, including e-mail, telephone, pager, facsimile, satellite radio, or wireless device. Further, different escalation business rules may be provided for particular individuals.

[0160] The additional intelligence may be useful for a security director or asset manager to obtain intelligence for greater contextual understanding of a security threat or increased risk situation. For example, such additional intelligence may include recent intelligence events occurring in a neighboring country near an asset in an impact area. Furthermore, the system 400 may provide additional intelligence by applying the rules engine to a traveler profile as described herein.

[0161] Furthermore, in an embodiment, a user of the system 400 may be provided with the capability to determine the reliability of the intelligence used in determining a critical alert. In particular, the Content Identification Segment (CIS) may provide the capability for a user to review the source catalog information associated with an event such as, for example, an event leading to a critical alert. Thus, the system 400 allows the security director or asset manager to apply his personal knowledge in assessing the reliability, for example, of the source(s) of a critical event to be used in

developing an appropriate response. In at least one embodiment, a user may interact with the global asset risk management system 400 to review the source catalog information maintained using the CIS. For example, Figure 28 is an exemplary source catalog page 2800 listing one or more sources of intelligence used in determining a critical alert. Referring to Figure 28, the catalog page 2800 may include, for each source, a source identifier 2801, a source name/title 2802, media type 2803, system reliability rating 2804, source location 2805, and a last visited date and/or timestamp. Each of these items may be entered by an analyst at an operations center facility of the global asset risk management system 400. Furthermore, the catalog page 2800 may include a source catalog search capability 2807. In an embodiment, the source catalog page 2800 may be an interactive page of a web browser application such as, for example, Microsoft™ Internet Explorer™.

[0162] In an embodiment, upon user selection of a source by, for example, using a mouse and cursor to select the line including the above described source information, the global asset risk management system 400 may respond by outputting to the user one or more interactive pages including further detailed information associated with the source. Each source entry may be hyperlinked to the source catalog page or one or more detailed information pages, for example. Such detailed information interactive pages may include, but are not limited to, general information, comments, metadata, a primary contact, an alternate contact, and ratings. The detailed information may be maintained using the CIS. Figure 29a is a first exemplary general interactive page 2900 showing general details associated with a source according to at least one embodiment. Referring to Figure 29a, the general details page 2900 may include a source summary 2901, the name of the creating analyst or person 2902 who created the source, the name of the analyst or person 2903 who last updated the source, the creation date 2904, and the date last updated 2905.

[0163] Figure 29b is a second exemplary general interactive page 2950 showing further general details associated with a source according to at least one embodiment. Referring to Figure 29b, the general details page 2950 may further include a media type 2906 associated with the source, a lifespan of the article 2907 if applicable, the interval between visits 2908 to the source using the system 400, the source title 2909, and a

source location 2910. The source location 2910 may be a Uniform Reference Locator (URL) for a HTML-formatted web page.

[0164] Figure 30 is an exemplary comments interactive page 3000 showing comments associated with a source according to at least one embodiment. Referring to Figure 30, the comments page 3000 may further include comments 3001 associated with the source, In an embodiment, the comments 3001 may be entered by an analyst such as a SME.

[0165] Figure 31 is an exemplary metadata interactive page 3100 showing metadata associated with a source according to at least one embodiment. In an embodiment, metadata associated with a source may include information maintained by the system 400 representing relationships of the source to various other informational items beyond the intelligence provided by the source. In an embodiment, each source may be associated with either an intelligence category (e.g., security, terrorism) or location/destination information (e.g., country). For example, referring to Figure 31, the metadata page 3100 may include a list of projects 3101 associated with the source, a list of the categories 3102 for the source, a list of locations 3103 to which the source pertains, and an overall source category tree 3104.

[0166] Figure 32 is an exemplary contact interactive page 3200 showing primary contact information associated with a source according to at least one embodiment. In an embodiment, contact information associated with a source may include a source owner or entity responsible for the source as well as address and communications contact information for the source owner. Secondary or alternate contact information may be provided on additional contact pages 3200

[0167] Figure 33 is an exemplary source ratings page 3300 showing one or more reliability ratings for a source. Referring to Figure 33, the source ratings page 3300 may include an initial reliability assessment 3301 and a system reliability rating 3302. The reliability rating assessment 3301 and 3302 may be individually assigned a rating such as, for example, "A," "B," or "C," representing a range of most reliable to least reliable, respectively. The initial reliability assessment 3301 may be a one-time rating assigned by an analyst or SME based on, for example, the analyst's past experience involving intelligence from the source. In an embodiment, the system reliability rating

3302 may be determined by the system 400 based on a rating algorithm that takes into account a variety of factors such as, but not limited to, the availability of the source to provide intelligence to agents of the system 400 as described earlier herein. Other factors may include the existence of human in the loop feedback regarding intelligence provided by the source to confirm development of the intelligence using, for example, a trend line analysis. The rating algorithm may assign a mathematical or statistical value to each of the various factors and then compute a reliability rating based on the weighted sum. By comparing the initial reliability assessment 3301 with the system reliability rating 3302, the user may determine the change in reliability of a source over time to aid in assessing the intelligence received from that source. Furthermore, the source ratings page 3300 may further include a source status 3304, reliability comments 3305, and source status comments 3306. The source status 3304 may indicate the current status for a source including, for example, "in use," "potential," "do not use," and "aggregator." Comments 3305 and 3306 may include analyst or SME observations regarding source reliability or status, respectively.

[0168] Figure 34 is an exemplary additional intelligence page 3400 of the risk mitigation toolbox in at least one embodiment. Referring to Figure 34, the intelligence page 3400 may include for each source listed an edit selection button 3501, source name/title 3402, a media type 3403 (e.g., plain text), a unique source identifier 3404, a system reliability rating 3405, a creation date 3406, a last updated date 3407, notes 3408 (e.g., a URL address of the World Wide Web), and an interactive repository search interface 3409. Upon operator selection of the edit selection button 3404, the system 400 may provide the capability for the user to edit the source information including the data fields shown in Figure 34. In an embodiment, the system 400 may provide the capability for the user to search the source catalog or repository by entering various search criteria using the repository search interface 3409.

[0169] Figure 35 is an exemplary reference document page 3500 showing a plain text document 3501 and an HTML formatted document 3502 of the risk mitigation toolbox in at least one embodiment.

[0170] Figure 36 is an exemplary additional intelligent metadata interactive page 3600 showing metadata associated with an additional intelligence source of the risk

mitigation toolbox according to at least one embodiment. In an embodiment, additional intelligence metadata associated with a source may include information maintained by the system 400 representing relationships of the source to various other informational items beyond the intelligence provided by the source. For example, referring to Figure 36, the additional intelligence metadata page 3600 may include a list of projects 3601 associated with the source, a list of the categories 3602 for the source, and a list of locations 3603 to which the source pertains.

[0171] Figure 37 is an exemplary additional intelligent ratings interactive page 3700 showing source ratings associated with an additional intelligence source of the risk mitigation toolbox according to at least one embodiment. For example, referring to Figure 37, the additional intelligence source ratings page 3700 may include a rater identifier 3701, a rate date 3702 that may include a date/timestamp, a numerically-scaled timeliness score 3703, a numerically-scaled accuracy score 3704, a numerically-scaled relevance score 3705, and source comments 3706.

[0172] In addition, in at least one embodiment, the analysis engine 403 may include a compliance function in which a person seeking to travel to a location adversely affected by a critical event, such as a location within an impact area, must first acquire the approval of the asset manager or security director prior to being permitted to travel to the location. This provides the asset manager the opportunity to ensure that the traveler has received proper training in dealing with the increased risk environment prior to traveling there. In at least one embodiment, this compliance function may be provided in the form an online test for which the traveler must obtain a satisfactory score prior to be authorized travel (e.g., prior to being issued tickets).

[0173] It is apparent that the global asset risk management system and methods described herein may by configured to provide many useful asset risk management functions in a variety of embodiments for both fixed and mobile assets including, but not limited to, people, facilities, and containers. For example, the global asset management system 400 may be configured to provide supply chain management by providing a risk assessment for a shipping route for assets or goods in shipment to avoid supply chain interruption (e.g., routing of supply ships around areas of increased risk). In such embodiments, the asset information may include individual shipping container tracking

information such as, for example, a container identification code associated with a set of periodically updated geographic coordinates or identifiers. Similarly, the global asset risk management system 400 may be configured to provide personnel tracking by associating a personal identifier with a set of periodically updated geographic coordinates or identifiers. In at least one embodiment, the tracking information may include GPS or GIS coordinates.

[0174] A further example of a risk assessment report according to an embodiment is shown in Figures 38a and 38b. Referring to Figure 38a, a message portion 3801 of a risk assessment report may include a text message 3802 containing intelligence and affected asset information associated with an intelligence event. The message portion may also include a mapping interface 3803 and an asset communications interface 3804. The mapping interface 3803 may include a selection mechanism by which a user may select to view a map portion of the risk assessment report. In an embodiment, when the user selects the mapping interface 3803 the analysis engine may render a map page such as that shown in Figure 38b. The analysis engine may use the CMS to obtain intelligence and information from the CRS in generating the map page. In an embodiment, when the user selects the asset communications interface 3804, the CMS may output an interactive page by which the user may compose and cause to be sent a message such as, for example, an electronic message or email, to the asset.

[0175] An example of a map page 3810 according to an embodiment is shown in Figure 38b. Referring to Figure 38b, the map page 3810 may include a graphical artifact representing an intelligence event 3811, a graphical artifact representing a landmark 3812, a graphical artifact representing a first asset 3813 such as a person on the ground at a location, and a graphical artifact representing a second asset 3814 such as a private facility. Further, the map page 3810 may also include a geofence 3815 representing a threat boundary. In the example, of Figure 38b, the area inside the geofence may represent a safe area, and the area outside the geofence may represent an area having an unacceptably high threat or risk. Alternatively, the geofence 3815 may correspond to a threat perimeter of a geocode in which the area inside the geofence represents the area of unacceptably high risk. The map page 3810 may also include text information 3816 to provide the user with, among other things, the status of assets 3813

or 3814 with respect to the geofence 3815. Further, in at least one embodiment, in response to the user selecting an intelligence event 3811 on the interactive map page 3810 (using, for example, a mouse device), the system 400 may output to the user the source catalog page 2800 (see Figure 28) so that the user may review the sources underlying the intelligence event. Thus, the risk assessment report may output to the user an indication of the vulnerability of one or more assets in the context of an intelligence event or events.

[0176] Whereas particular embodiments of this invention have been described above for purposes of illustration, it can be evident to those skilled in the art that numerous variations of the details of the present invention may be made without departing from the invention as defined in the appended claims.

CLAIMS

1. A risk management system comprising:

at least one information source; and

an analysis system configured to provide a risk assessment report.

2. The risk management system of claim 1, further comprising at least one physical asset information source including real time physical asset location tracking information, wherein the analysis system is configured to provide the risk assessment report based on input from the at least one information source and the at least one physical asset information source, and the at least one information source includes at least one intelligence source.

3. The risk management system of claim 1, wherein the analysis system is further configured to provide the risk assessment report using a content identification segment.

4. The risk management system of claim 1, further comprising a risk mitigation toolbox coupled to the analysis system and configured to identify related intelligence maintained using the at least one information source and related information maintained using the at least one information source.

5. The risk management system of claim 4, wherein the risk mitigation toolbox further includes a notification system that distributes notification messages according to a set of business rules that include an escalation mechanism.

6. The risk management system of claim 2, wherein the physical asset information includes geographic location information.

7. The risk management system of claim 6, wherein the geographic location information includes a set of Global Positioning System coordinates associated with an asset.

8. The risk management system of claim 6, wherein the geographic location information includes a set of coordinates for a geographic information system associated with an asset.

9. The risk management system of claim 6, wherein the geographic location information is associated with a fixed asset.

10. The risk management system of claim 6, wherein the geographic location information is associated with a movable asset.

11. The risk management system of claim 6, wherein the geographic location information is associated with a person that is employed by an organization using the risk management system.

12. The risk management system of claim 1, wherein the information includes geocodes.

13. The risk management system of claim 1, wherein the risk assessment report includes a graphical user interface further comprising:

a first graphical artifact representing an intelligence event;

a second graphical artifact representing an asset; and

a geofence representing a threat boundary.

14. A risk management method comprising:

receiving information from at least one information source; and

generating a risk assessment report based on the information.

15. The risk management method of claim 14, further comprising receiving asset information from at least one physical asset information source real time physical asset location tracking information.

16. The risk management method of claim 15, further comprising identifying related intelligence information and physical asset information with a risk mitigation toolbox, wherein the related intelligence information is maintained using the at least one information source and the related physical asset information is maintained using the at least one physical asset information source.

17. The risk management method of claim 14, wherein generating the risk assessment report includes using a content identification segment.

18. The risk management method of claim 15, wherein the physical asset information includes geographic location information.

19. The risk management method of claim 18, wherein the geographic location information includes a set of Global Positioning System coordinates associated with an asset.

20. The risk management method of claim 18, wherein the geographic location information includes a set of coordinates for a geographic information system associated with an asset.

21. The risk management method of claim 14, wherein the information includes geocodes.

22. The risk management method of claim 14, further comprising sending critical event notification messages to users according to a set of business rules that include an escalation mechanism.

23. The risk management method of claim 18, wherein the geographic location information is associated with a fixed asset.

24. The risk management method of claim 18, wherein the geographic location information is associated with a movable asset.

25. The risk management method of claim 18, wherein the geographic location information is associated with a person that is employed by an organization using the risk management system.

26. The risk management method of claim 14, wherein generating the risk assessment report further comprises:

outputting a map page to a user, the map page including a graphical user interface;

representing an intelligence event using a first graphical artifact;

representing an asset using a second graphical artifact; and

representing a threat boundary using a geofence.

27. An asset risk management system comprising:

at least one intelligence source;

at least one physical asset information source including real time physical asset location tracking information; and

an analysis engine coupled to the at least one intelligence source and the at least one asset information source, the analysis engine configured to provide a risk assessment report.

28. The asset risk management system of claim 27, further comprising a risk mitigation toolbox configured to identify related intelligence maintained using the at least one intelligence source and related information maintained using the at least one physical asset information source.

29. The asset risk management system of claim 28, wherein the risk mitigation toolbox further includes a notification system that distributes notification messages according to a set of business rules that include an escalation mechanism.

30. The asset risk management system of claim 27, wherein the physical asset information includes geographic location information

31. The asset risk management system of claim 30, wherein the geographic location information includes a set of Global Positioning System coordinates associated with a physical asset.

32. The asset risk management system of claim 30, wherein the geographic location information includes a set of coordinates for a geographic information system associated with a physical asset.

33. The asset risk management system of claim 30, wherein the geographic location information is associated with a fixed asset.

34. The asset risk management system of claim 30, wherein the geographic location information is associated with a movable asset.

35. The asset risk management system of claim 30, wherein the geographic location information is associated with a person that is employed by an organization using the risk management system.

36. The asset risk management system of claim 27, wherein the intelligence includes geocodes

37. The risk management system of claim 27, wherein the risk assessment report is provided from the analysis engine using a content identification segment and includes a graphical user interface further comprising:

a first graphical artifact representing an intelligence event;

a second graphical artifact representing an asset; and

a geofence representing a threat boundary.

38. An asset risk management method comprising:

receiving intelligence from at least one intelligence source;

receiving asset information from at least one physical asset information source including real time physical asset location tracking information;

generating a risk assessment report based on the intelligence and the physical asset information; and

identifying related intelligence and physical asset information, wherein the related intelligence is maintained using the at least one intelligence source and the related physical asset information is maintained using the at least one physical asset information source.

39. The asset risk management method of claim 38, wherein the asset information includes geographic location information.

40. The asset risk management method of claim 38, wherein the geographic location information includes a set of Global Positioning System coordinates associated with an asset.

41. The asset risk management method of claim 39, wherein the geographic location information includes a set of coordinates for a geographic information system associated with an asset.

42. The asset risk management method of claim 39, wherein the intelligence includes geocodes.

43. The asset risk management method of claim 38, further comprising sending critical event notification messages to users according to a set of business rules that include an escalation mechanism.

44. The asset risk management method of claim 39, wherein the geographic location information is associated with a fixed asset.

45. The asset risk management method of claim 39, wherein the geographic location information is associated with a movable asset.

46. The asset risk management method of claim 39, wherein the geographic location information is associated with a person.

47. The asset risk management method of claim 38, wherein generating the risk assessment report is performed using a content identification segment and further comprises:

outputting a map page to a user, the map page including a graphical user interface;

representing an intelligence event using a first graphical artifact;

representing an asset using a second graphical artifact; and

representing a threat boundary using a geofence.