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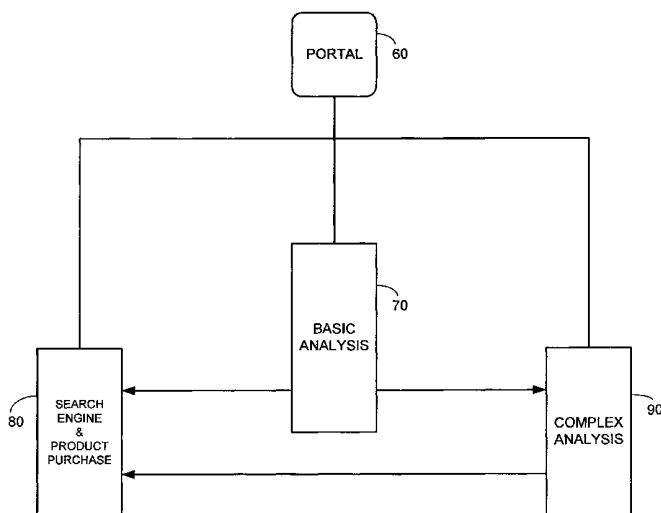
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(54) Title: INTELLIGENT INTERNET PORTAL



(57) Abstract: An intelligent portal (60) web site has at least two portions. A user can visit the portions in any sequence, and is assumed to enter data at the first visited portion. Information from the first portion visited by the user is automatically transferred to the second portion. The transferred information may be data entered by the user at the first portion and/or results generated by the first portion based on the data entered by the user. The second portion tailors the questions and information presented to the user in accordance with the transferred information, and typically produces its own result for the user. Based on the information entered by the user, the first portion also directs the navigation of the user by suggesting an appropriate second portion of the web site. When the web site is an occupational safety portal, the first portion provides analysis services (70) and the second portion provides search services (80). The analysis services (70) include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTELLIGENT INTERNET PORTAL

The disclosure of each of U.S. provisional patent application serial number 60/165,116, "Workplace Tracking and Reporting System", and U.S. provisional patent application serial number 60/165,115, "Method and System for Workplace Job Assessment",
5 both filed on November 12, 1999, having common inventors herewith, is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

The present invention relates to an Internet portal, and more particularly, is directed to a web site for related content organized into portions that are configured to transfer
10 information provided by a user between the portions, and to direct the user's navigation among portions based on the information provided by the user.

An Internet portal is a web site that serves as a gateway to a wide range of content. Initially, a portal site was just a site with a search engine for locating content at other web sites. Such sites experienced a lot of visitor traffic. To keep a visitor at its site longer,
15 thereby providing more opportunities to present ads to the visitor, the site provider started offering local content such as news, weather, stock forecasts, horoscopes and so forth, and became known as a "portal". To promote visitor loyalty, the portal site enabled a user to "customize" its site by selecting what types of content should be initially presented. Some portal sites began offer e-mail addresses to visitors, to further promote repeat visits.

20 In a conventional portal, the user directs his or her own navigation. Since users are generally unaware of the breadth of information available at the portal, it is believed that most users do not get the full benefit of what is available at the portal, resulting in a sub-optimal experience for the user, and missed revenue opportunities for the portal operator.

Opportunities exist to further personalize portal offerings for an individual visitor.

25 SUMMARY OF THE INVENTION

In accordance with an aspect of this invention, there are provided a web site and a method of operating a web site, wherein the web site has at least two portions. A first portion is for receiving data from a user, and generating a first result based on the data entered by the user. A second portion is for receiving information from the first portion, the
30 information relating to data entered by a user, and providing a second result to the user based on the information received from the first portion.

The first portion is also for directing the user to the second portion in accordance with the data received from the user. The web site resides on a server, and the information from the first portion may be a file stored on the server or in a terminal used by the user. The second portion is also for selecting questions for presentation to the user in accordance
5 with the information received from the first portion. At least one of the first and second portions automatically transfers information to a third portion, receives a third result from the third portion based on the transferred information, and incorporates the third result in its own result. When the web site is an occupational safety portal, the first portion provides analysis services and the second portion provides search services. The analysis services
10 include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

In accordance with another aspect of this invention, there are provided a portion of a web site and a method of operating the portion of the web site, comprising receiving information from another portion, the information relating to data entered by a user, and
15 providing a result to the user based on the information received from the other portion.

The result may also be based on additional information provided by the user. The other portion may be at another web site.

In accordance with a further aspect of this invention, there are provided a web site that directs navigation by a user and a method of directing navigation by a user through a
20 web site. A first portion of the web site generates a result based on data entered by the user, and suggests a second portion of the web site to the user as a function of the result.

The web site may also receive information from the first portion and generate a second result in accordance with the received information.

It is not intended that the invention be summarized here in its entirety. Rather,
25 further features, aspects and advantages of the invention are set forth in or are apparent from the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram depicting the hardware and telecommunications environment of the present invention;

30 Fig. 2 is a chart showing the organization of portions of a portal web site according to the present invention;

Fig. 3 is a flowchart showing processing at a portion of a portal web site according to the present invention;

Fig. 4 is a chart showing an occupational safety portal web site according to the present invention; and

5 Figs. 5 and 6 are charts showing screens at the portal web site of Fig. 4.

DETAILED DESCRIPTION

An intelligent portal web site has at least two portions. A user can visit the portions in any sequence, and is assumed to enter data at the first visited portion. Information from the first portion visited by the user is automatically transferred to the second portion. The transferred information may be data entered by the user at the first portion and/or results
10 generated by the first portion based on the data entered by the user. The second portion tailors the questions and information presented to the user in accordance with the transferred information, and typically produces its own result for the user. Based on the information entered by the user, the first portion also directs the navigation of the user by suggesting an
15 appropriate second portion of the web site. When the web site is an occupational safety portal, the first portion provides analysis services and the second portion provides search services. The analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

Referring now to the drawings, and in particular to Fig. 1, there is illustrated a block
20 diagram depicting a hardware and telecommunications environment. Fig. 1 includes public telecommunications network 10, private telecommunications network 20, user terminals 22, 24, 30, 35, and servers 26, 28, 40, 50.

Public telecommunications network 10 is adapted to transmit data between data transmitting and receiving devices coupled thereto. An example of network 10 is the
25 Internet. For brevity, network 10 is interchangeably referred to as Internet 10.

Private telecommunications network 20 is adapted to transmit data between data transmitting and receiving devices coupled thereto. An example of network 20 is a corporate intranet. For brevity, network 20 is interchangeably referred to as intranet 20.

User terminals 22, 24, 30, 35 are devices programmed to transmit and receive data
30 according to a format employed in Internet 10 and/or intranet 20. An example of a user terminal is a personal computer executing an operating system program, such as Microsoft Windows, and a so-called browser program, such as Netscape Navigator. Other examples of

a user terminal are Internet-enabled wireless or wireline telephones, personal digital assistants and so on.

Servers 26, 28, 40, 50 are general purpose computers programmed to receive requests for information and to respond to the requests by providing the requested information and to operate according to pre-determined programs. An example of a server is a workstation or dedicated computer executing an operating system program, such as Unix or Windows NT, and a server program, such as Apache. Generally, the information is organized into a web site, that is, pages conforming to a markup language such as hypertext markup language (HTML) or extensible markup language (XML) and having hyperlinks between the pages of the web site.

In a typical operation scenario, terminal 35 requests a page of information from server 50 via Internet 10. Server 50 responds by serving the requested page to terminal 35 via Internet 10. The page may contain forms for collecting data. After the user of terminal 35 enters data, such as by typing or speaking or indicating a file for uploading or other data entry methods apparent to one of ordinary skill, terminal 35 transfers the data to server 50 via Internet 10. Server 50 receives the data and processes it according to scripts or programs. At some point, the web site may contain a page with a hyperlink to data stored at server 40. When a user of terminal 35 activates this hyperlink, such as by clicking on the hyperlink with a pointing device such as a mouse, terminal 35 produces a request for data and transmits the request to server 40, which responds thereto. The user may or may not be aware that data is being provided by multiple servers.

A typical operation scenario for intranet 20 is similar to that described above for Internet 10. It will be appreciated that a so-called firewall may be included in intranet 20. A firewall is a general purpose computer programmed to intercept all traffic from devices connected to intranet 20 and intended for Internet 10, and to filter all traffic from Internet 10 to devices coupled to intranet 20.

A portal web site according to the present invention comprises web pages and associated software programs executable at one or more of servers 26, 28, 40 and 50.

As used herein and in the claims, a "portion of a web site" refers to a series of web pages hyperlinked together to form a unit that provides information and/or services in a generally standalone manner except for receiving and/or providing information to other portions of the web site as described herein. From a user's viewpoint, a portion of a portal

web site is associated mainly with a certain type of activity or activities, and each of the portions of a portal web site are associated with generally different activities.

As used herein and in the claims, an intelligent portal web site has at least two portions, at least one portion being a search engine.

5 Fig. 2 is a chart showing the organization of portions of a portal web site having home page 60, and portions 70, 80 and 90. Each of portions 70, 80, 90 includes at least one page and associated programs, if any, and may reside on the same server or a different server as home page 60. As described below, at least one first portion is configured to collect data from a visitor, such as a user of terminal 35, and at least one other portion is configured to
10 receive the collected data from the first portion and provide results to the visitor based on the received data.

In the example of Fig. 2, portion 70 collects some data from the user and in response thereto provides a basic analysis result, then presents the user with a hyperlinks to portions 80 and 90. Portion 80 provides information about products available for purchase through a
15 search engine and may support electronic purchasing. So-called e-commerce technology is well known to those of ordinary skill in the art.

Portion 90 is adapted to collect data from the user and in response thereto, to provide a complex analysis result, and to present the user with a hyperlink to portion 80. A user may go directly to portion 90 and provide data. Or, a user may go to portion 70, enter some data,
20 and then portion 70 may transfer information to portion 90 for further analysis with or without additional data collection.

In this example, the information provided by portion 80 depends on the information transferred from portions 70 and/or 90, if any. That is, a user may go directly from home page 60 to portion 80, and provide information relating to products of interest to the user.
25 Alternatively, when a user visits portions 70 and/or 90 and then goes to portion 80, portions 70 and/or 90 transfer information, namely data entered by the user and/or results generated by the respective portion, to portion 80. In turn, portion 80 uses the transferred information to produce results for the user without requiring the user to re-enter the previously entered information. Hence, portions 70, 80 and 90 co-operate to form an intelligent Internet or
30 intranet portal web site.

It will be understood that additional portions may be accessible from portal home page 60, and/or the portions of the portal web site, and that these additional portions may or

may not transfer information therebetween. As used herein, an intelligent web site portion is one that transfers, that is, sends and/or receives, information to and/or from another intelligent web site portion. An intelligent portal site comprises at least one intelligent web site portion adapted to transmit information and at least one other intelligent web site portion adapted to receive information, with information meaning data input from a user and/or results determined in accordance with the data input from the user.

Information is transferred between intelligent web site portions using software mechanisms such as cookies, a file residing at the server, a file residing at the user's terminal and so on. A cookie is a set of information, up to 3000 characters, sent to a particular server with each request from the terminal for maintaining state information. Typically, a cookie is a unique identifier used to access a file stored at the server so that state information relating to a session with a user can be maintained. A cookie may be temporary, expiring after each session between the user and server, or may be persistent, that is, when the user visits the server again, the user's previous activity is recalled by the server with reference to the cookie from the user. A cookie may be employed when the user is anonymous, and allows an anonymous user to be registered for a session with the portal web site.

In some cases, server 50 sends software to terminal 35 for local execution, such as a so-called JAVA applet, and the applet retains information, that is, data entered at one portion or results determined at the one portion, and automatically provides the retained information to a second portion. In other cases, instead of a temporary program such as an applet, a program that permanently resides at the user's terminal is provided.

Conventional form helper programs comprise software executing at the user terminal, or client, that store information entered into a field of a form, and when that field appears in another form, typically at another web site, the form helper program automatically provides the stored information for the field. The field is typically formatted according to a standard such as XML, and represents typical information identifying a user.

In contrast, when software is downloaded to terminal 35 from the intelligent portal web site, the downloaded software stores both a question, or information identifying the question, and the user's answer provided at a first portion, then recognizes the question at a second portion and automatically provides the corresponding stored answer. The question need not be chosen from a set of standardized information.

Fig. 3 is a flowchart showing processing at an intelligent portion of a portal web site.

At step 110, portion 90 determines whether the user transferred to this portion from another portion of the portal web site, such as portion 70, by examining a cookie accompanying a page request from the user. If the user has transferred, then at step 120, portion 90 receives the previously entered information, that is, data entered by the user or results determined by portion 70 in accordance with the data entered by the user. If the user has not transferred, then at step 130, portion 90 collects the information directly from the user. It will be appreciated that portion 90 may have to independently generate the results that would have been generated by portion 70 if the user had transferred therefrom. After executing the appropriate one of steps 120 and 130, portion 90 proceeds to step 140.

At step 140, portion 90 determines whether additional information relative to what is collected at portion 70 should be collected from the user. If not, portion 90 proceeds to step 160. If so, then at step 150, portion 90 collects the additional information from the user, and proceeds to step 160.

At step 160, portion 90 provides results to the user other than what was provided by portion 70.

At step 170, portion 90 determines whether additional information should be collected from the user. If not, portion 90 proceeds to step 180. If so, then portion 90 proceeds to step 150 to collect additional information.

At step 180, portion 90 provides the user with a choice of hyperlinks and may transfer its information such as by storing its information in a file associated with the identifier in the cookie from the user, for use by the destination portion of the hyperlink.

Capabilities of an intelligent portal web site include directing a user's navigation based on an analysis of the user's inputs, and automatically transferring information between portions of the portal web site. The intelligent portal web site may apply expert or rules based reasoning, case based reasoning, neural networks, bayesian techniques or other analysis procedures to data input by the user.

An example of an intelligent Internet portal in the field of occupational safety will now be described. Fig. 4 depicts occupational safety portal web site 200, having four portions:

- search engine portion 210;
- value-added web based services portion 220;
- on-line content portion 230; and

- e-commerce marketplace portion 240.

Search engine portion 210 includes:

- generic information search -- enables keyword based web searching of portal 200 and the Internet. Matches within portal 200 are always displayed before matches from the Internet. Search keywords are automatically passed from a previously visited portion of the portal, and for an automatic search. The user may modify the search terms.
- solution finder -- relates items in e-commerce marketplace portion 240 to a potential user need. The solution finder includes a database of questions that focus on a set of products having suitable characteristics. When information is passed from a previously visited portion, a customized list of questions from the questions database is formed and presented to the user. Based on the answers to the questions, appropriate products are presented to the user. Alternatively, an additional list of questions is presented to further focus solution finding.
- consultant and supplier directory – for situations in which the user wants human advice, questions are presented to assist the user in locating appropriate suppliers and/or consultants.

When a user is referred from Level 1 of value-added web based services portion 220, the data from Level 1 is automatically input as a starting point in search engine portion 210. Additional questions are asked based on the type of high-level solution to help narrow the solution to meet the user's needs. Once a narrow solution is identified, the user is directed to e-commerce marketplace portion 240.

A user may begin at search engine portion 210 of portal web site 200. Depending on the user's inputs to various forms and questions, the user is directed to value added services portion 220, on-line content portion 230 or e-commerce marketplace portion 240.

Value-added web based services portion 220 includes an initial assessment based on checklists presented as forms that can be quickly completed (Level 1) to provide possible concerns and general solutions, and to act as a marketing tool for other levels of risk assessment and to catalog information about inquirers. The Level 1 model may be based on PLIBEL as described in Kemmlert, "A method assigned for the identification of ergonomic hazards – PLIBEL", *Applied Ergonomics*, 1995, vol. 26, pp 199-211.

Level 1, workplace hazard screening, provides the user a high-level screening of the safety hazards in a workplace. An expert system Artificial Intelligence engine analyzes the number, nature, and severity of the hazards identified and matches the input to a set of solutions and recommendations based on a set of stored “expert rules”. The output of Level 1 may recommend that the user continue to Level 2 or Level 3. The output of Level 1 may also recommend high-level solutions to the hazards, and then direct the user to the search engine, providing the data from Level 1 as a starting point to the search engine.

Fig. 5 shows a sample web page for Level 1, workplace hazard screening.

Value-added web based services portion 220 includes a second level of inexpensive risk assessment (Level 2) to meet standards such as those promulgated by the Occupational Safety and Health Administration (OSHA) and fit into a comprehensive ergonomics program. The Level 2 model may be based on RULA described in McAtamney et al., “RULA: a survey method for the investigation of work-related upper limb disorders”, *Applied Ergonomics*, 1993, vol. 24, no. 2, pp 91-99. The input and output from Level 2 may be analyzed by an “expert rules” artificial intelligence system to enhance the identification of high-level solutions.

Fig. 6 shows a sample web page for Level 2, workplace hazard prioritization.

Value-added web based services portion 220 includes a third level of risk assessment (Level 3) to combine the detailed job and ergonomic risk factor information from a Level 2 evaluation with other quantitative data to determine risk levels and expected injury rates. Quantitative results are used to generate a report with solutions based on a database of prior assessments and associated control tactics, for assessing current jobs or testing alternative workplace designs. The Level 3 model may be based on OCRA described in Columbini, “An observational method for classifying exposure to repetitive movements of the upper limbs”, *Ergonomics*, 1998, vol. 41, no. 9, pp 1261-1289; Occhipinti, “OCRA: a concise index for the assessment of exposure to repetitive movements of the upper limbs”, *Ergonomics*, 1998, vol. 41, no. 9, pp 1290-1311; and Grieco, “Application of the concise exposure index (OCRA) to task involving repetitive movements of the upper limbs in a variety of manufacturing industries: preliminary validations”, *Ergonomics*, 1998, vol. 41, no. 9, pp 1347-1356.

The goal of Level 3 service is to identify a risk level and expected injury rates. Level 3, workplace risk assessment, provides a series of case forms with more detailed questions

relating to the safety issues of the workplace that are filled out by the user to complete the risk assessment input. A case-based reasoning, artificial intelligence engine compares the input case to completed cases stored in a database. The engine finds closely matching cases and suggests recommendations for the new case similar to the recommendations made in the
5 closely matching cases. The recommendations may direct the user to other portions of the portal.

Value-added web based services portion 220 includes a fourth level of risk assessment (Level 4) to manage and track ergonomic safety programs and develop a process particular to a facility. Musculoskeletal symptom surveys or discomfort surveys and injury
10 or illness rates for each specific job investigated are collected to derive the statistical relationship between ergonomic risk factor exposure and symptoms or discomfort, and between ergonomic risk factor exposure and work days lost. The safety program management and tracking service is described in U.S. provisional patent applications 60/165, 116 and 60/165,115.

15 On-line content portion 230 includes:

- free content – articles, reviews of products available through the e-commerce marketplace portion, news. When the user has already identified products of interest at search engine portion 210 or e-commerce marketplace portion 240, on-line content portion 230 presents information related to the identified
20 products.
- pay content – web-based employee training programs

E-commerce marketplace portion 240 enables the user to purchase solutions recommended at other portions. If the user is unsure about whether to make the purchase or not, the user is directed to the on-line content portion.

25 An example of transferring data between portions of occupation safety portal 200 will now be provided.

Let it be assumed that the following questions are presented in Level 1 of value-added web based services portion 220:

1. Is the walking surface uneven, sloping, slippery or nonresilient?
- 30 2. Is the space too limited for certain work movements or work materials?
3. Are any tools or equipment unsuitably designed for the worker or the task?

4. Is the working height of workspace elements (tables, desks, chairs, tools, etc.) incorrectly adjusted?
5. Is the working chair poorly designed or incorrectly adjusted?
6. Is the work performed while standing, with no opportunity to sit and rest?
- 5 7. Is fatiguing foot-pedal work performed?
8. Is fatiguing leg work performed? (check all that apply)
- a) Repeated stepping up on stool, step etc.?
 - b) Repeated jumps, prolonged squatting or kneeling?
 - c) One leg being used more often in supporting the body?
- 10 9. Is repeated or sustained work performed when the back is: (check all that apply)
- a) Mildly flexed forward?
 - b) Severely flexed forward?
 - c) Bent sideways or mildly twisted?
 - 15 d) Severely twisted?
10. Is repeated or sustained work performed when the neck is: (check all that apply)
- a) Flexed forward?
 - b) Bent sideways or mildly twisted?
 - 20 c) Severely twisted?
 - d) Extended Backwards?
11. If loads are lifted manually, do you notice: (check all that apply)
- a) Periods of repetitive lifting?
 - b) Heavy loads?
 - 25 c) Awkward grasping of load?
 - d) Awkward location of load at onset or end of lifting?
 - e) Handling beyond forearm length?
 - f) Handling below knee height?
 - g) Handling above shoulder height?
- 30 12. Is repeated, sustained, or uncomfortable carrying, pushing or pulling of loads performed?

13. Is sustained work performed when one arm reaches forward or to the side without support?

14. Is there repetition of: (check all that apply)

a) Similar work movements?

5 b) Similar work movements beyond comfortable reaching distance?

Assume the user answers "yes" to questions 9b, 11a, 11b, 11d, and 11f. The AI subsystem, either through an expert rules system or a Case Based Reasoning tool, determines that a lifting solution is needed, but perhaps in this case there is not enough information to identify a precise solution. If a precise solution were identified at this step, the user could be
10 transferred directly to e-commerce marketplace portion 240 to purchase the item.

Since more information is necessary, portal 200 transfers the user to search engine portion 210 that automatically searches a custom catalog for product attributes and specifications in order to narrow down the solution. The original inputs from services portion 220 and the result of the analysis "lifting solution" obtained at services portion 220 are
15 transferred to search engine portion 210. Based on this information, search engine portion 210 identifies a special set of appropriate questions from a database of questions and displays these to the user.

Had the user started in search engine portion 210, the search questions would begin at a basic level. However since search engine portion 210 knows that the user is interested
20 in lifting solutions, the questions will focus on an appropriate sub-category of lifting solutions. Let it be assumed that lifting solutions are categorized as shown below:

Master Database of Solutions

Chairs

Stools

25 Sit/stand devices

Desk chair

Lifting Devices

Overhead lift assists

Lift tables

30 Rotating top

Tilting top

Electric

Pneumatic

Manual (spring counterbalance)

Material Transport Devices

Fork lifts

5 Hand trucks

Carts

Anti-vibration

Anti-vibration gloves

Cushioned tool wraps

10 Cushioned Ergonomic tools

Personal Protective Equipment

Ear protection

Eye protection

15 Questions displayed to the user by search engine portion 210 focused on identifying a lifting solution are as follows:

1. What is the weight of the item lifted?
2. Are the items located: (check all that apply)
 - a) in a bin
 - b) on a pallet?
- 20 3. Do the items need to be carried more than five feet after lifting?
4. Are there any space constraints in the workstation?
5. Is there a preference for: (check all that apply)
 - a) Electric
 - b) Pneumatic
 - 25 c) Mechanical solutions
6. Are the items lifted large sheet goods?

The above question set is dynamically generated based on the previous inputs of the user. For instance had the user previously entered in the weight of the item lifted in another portion of the portal, question 1 would not be displayed and the previously entered weight 30 would be used in the next analysis.

If the user answered greater than 10 lbs for item 1 and yes to items 2a and 5a, portal 200 transfers the user to e-commerce marketplace portion 240 which automatically presents

available “electrically operated tilting lift tables”. On the other hand, had the user answered greater than 10 lbs for item 1 and yes to items 3, 5b and 6, portal 200 transfers the user to e-commerce marketplace portion 240 which automatically presents available “overhead vacuum operated lift assists”.

5 Once in e-commerce marketplace section 240, the user may be asked additional questions to identify a particular vendor’s product over another product. Questions related to price, availability and so on are presented to the user. The AI system uses answers to previous questions from other portions of portal 200 in determining the best product or products. When marketplace portion 240 decides competing products are equally or close to
10 equally appropriate, marketplace portion 240 directs the user to content portion 230 to view a product review article to help decide on a purchase.

 In another embodiment, an intelligent portal web site is configured to communicate with a third party web site in similar manner as portions of the intelligent portal web site communicate with each other. That is, user input provided at the third party web site are
15 passed from the third party web site server to the intelligent portal web site server when the user leaves the third party web site or arrives at the intelligent portal web site.

 Although the above embodiments have been described as operating in a generally sequential manner, in other embodiments, the portions are configured to operate in a parallel manner. For example, an analysis portion may automatically request a search for
20 appropriate products from a product portion, so as to produce for the user an analysis output incorporating appropriate products.

 In a modification, any of the above-described embodiments may be configured with default answers, such as the most popular answers, or default answers selected based on actual answers to previously presented questions.

25 Although illustrative embodiments of the present invention, and various modifications thereof, have been described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to these precise embodiments and the described modifications, and that various changes and further modifications may be effected therein by one skilled in the art without departing from the
30 scope or spirit of the invention as defined in the appended claims.

What is claimed is:

1. A method of operating a web site having at least two portions, comprising:
at the first portion, receiving data from a user, and generating a first result based on the data entered by the user, and
at the second portion, receiving information from the first portion, the information relating to data entered by a user, and providing a second result to the user based on the information received from the first portion.
2. The method of claim 1, further comprising, at the first portion, directing the user to the second portion in accordance with the data received from the user.
3. The method of claim 1, wherein the web site resides on a server and the information from the first portion is a file stored on the server.
4. The method of claim 1, wherein the information from the first portion is stored in a terminal used by the user.
5. The method of claim 1, wherein the information received from the first portion includes the data received from the user.
6. The method of claim 1, wherein the information received from the first portion includes the first result generated by the first portion.
7. The method of claim 1, further comprising, at the second portion, selecting questions for presentation to the user in accordance with the information received from the first portion.
8. The method of claim 1, wherein at least one of the first and second portions automatically transfers information to a third portion, receives a third result from the third portion based on the transferred information, and incorporates the third result in its own result.
9. The method of claim 1, wherein the web site is an occupational safety portal, the first portion provides analysis services and the second portion provides search services.
10. The method of claim 9, wherein the analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.
11. A method of operating a portion of a web site, comprising:
receiving information from another portion, the information relating to data entered by a user, and

providing a result to the user based on the information received from the other portion.

12. The method of claim 11, wherein the result is also based on additional information provided by the user.

13. The method of claim 11, wherein the web site resides on a server and the information from the other portion is a file stored on the server.

14. The method of claim 11, wherein the information from the other portion is stored in a terminal used by the user.

15. The method of claim 11, wherein the information received from the other portion includes the data received from the user.

16. The method of claim 11, wherein the information received from the other portion includes the first result generated by the first portion.

17. The method of claim 11, further comprising selecting questions for presentation to the user in accordance with the information received from the other portion.

18. The method of claim 11, further comprising automatically transferring information to a third portion, receiving a third result from the third portion based on the transferred information, and incorporating the third result in the result provided to the user.

19. The method of claim 11, wherein the web site is an occupational safety portal, and the portions provide analysis and search services, respectively.

20. The method of claim 19, wherein the analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

21. The method of claim 11, wherein the other portion is at another web site.

22. A method of directing navigation by a user through a web site, comprising: at a first portion of the web site, generating a result based on data entered by the user, and

suggesting a second portion of the web site to the user as a function of the result.

23. The method of claim 22, further comprising, at the second portion, receiving information from the first portion and generating a second result in accordance with the received information.

24. The method of claim 23, wherein the web site resides on a server and the information from the first portion is a file stored on the server.

25. The method of claim 23, wherein the information from the first portion is stored in a terminal used by the user.

26. The method of claim 23, wherein the information received from the first portion includes the data entered by the user.

27. The method of claim 23, wherein the information received from the first portion includes the result generated by the first portion.

28. The method of claim 23, further comprising selecting questions for presentation to the user in accordance with the information received from the first portion.

29. The method of claim 23, further comprising, at one or more of the first and second portions, automatically transferring information to a third portion, receiving a third result from the third portion based on the transferred information, and incorporating the third result in the result provided to the user.

30. The method of claim 22, wherein the web site is an occupational safety portal, and the portions provide analysis and search services, respectively.

31. The method of claim 30, wherein the analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

32. A web site having at least two portions, comprising:
a first portion for receiving data from a user, and generating a first result based on the data entered by the user, and
a second portion for receiving information from the first portion, the information relating to data entered by a user, and providing a second result to the user based on the information received from the first portion.

33. The web site of claim 32, wherein the first portion is also for directing the user to the second portion in accordance with the data received from the user.

34. The web site of claim 32, wherein the web site resides on a server and the information from the first portion is a file stored on the server.

35. The web site of claim 32, wherein the information from the first portion is stored in a terminal used by the user.

36. The web site of claim 32, wherein the information received from the first portion includes the data received from the user.

37. The web site of claim 32, wherein the information received from the first portion includes the first result generated by the first portion.

38. The web site of claim 32, wherein the second portion is also for selecting questions for presentation to the user in accordance with the information received from the first portion.

39. The web site of claim 32, wherein at least one of the first and second portions automatically transfers information to a third portion, receives a third result from the third portion based on the transferred information, and incorporates the third result in its own result.

40. The web site of claim 32, wherein the web site is an occupational safety portal, the first portion provides analysis services and the second portion provides search services.

41. The web site of claim 40, wherein the analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

42. A portion of a web site, comprising:
means for receiving information from another portion, the information relating to data entered by a user, and

means for providing a result to the user based on the information received from the other portion.

43. The web site portion of claim 42, wherein the result is also based on additional information provided by the user.

44. The web site portion of claim 42, wherein the web site resides on a server and the information from the other portion is a file stored on the server.

45. The web site portion of claim 42, wherein the information from the other portion is stored in a terminal used by the user.

46. The web site portion of claim 42, wherein the information received from the other portion includes the data received from the user.

47. The web site portion of claim 42, wherein the information received from the other portion includes the first result generated by the first portion.

48. The web site portion of claim 42, further comprising means for selecting questions for presentation to the user in accordance with the information received from the other portion.

49. The web site portion of claim 42, further comprising means for automatically transferring information to a third portion, for receiving a third result from the third portion

based on the transferred information, and for incorporating the third result in the result provided to the user.

50. The web site portion of claim 42, wherein the web site is an occupational safety portal, and the portions provide analysis and search services, respectively.

51. The web site portion of claim 50, wherein the analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

52. The web site portion of claim 42, wherein the other portion is at another web site.

53. A web site that directs navigation by a user therethrough, comprising:
a first portion of the web site for generating a result based on data entered by the user, and for suggesting a second portion of the web site to the user as a function of the result.

54. The web site of claim 53, further comprising the steps of, at the second portion, receiving information from the first portion and generating a second result in accordance with the received information.

55. The web site of claim 54, wherein the web site resides on a server and the information from the first portion is a file stored on the server.

56. The web site of claim 54, wherein the information from the first portion is stored in a terminal used by the user.

57. The web site of claim 54, wherein the information received from the first portion includes the data entered by the user.

58. The web site of claim 54, wherein the information received from the first portion includes the result generated by the first portion.

59. The web site of claim 54, further comprising the step of selecting questions for presentation to the user in accordance with the information received from the first portion.

60. The web site of claim 54, further comprising the steps of, at one or more of the first and second portions, automatically transferring information to a third portion, receiving a third result from the third portion based on the transferred information, and incorporating the third result in the result provided to the user.

61. The web site of claim 53, wherein the web site is an occupational safety portal, and the portions provide analysis and search services, respectively.

62. The web site of claim 61, wherein the analysis services include at least one of a level of hazard screening, a level of hazard prioritization and a level of risk assessment.

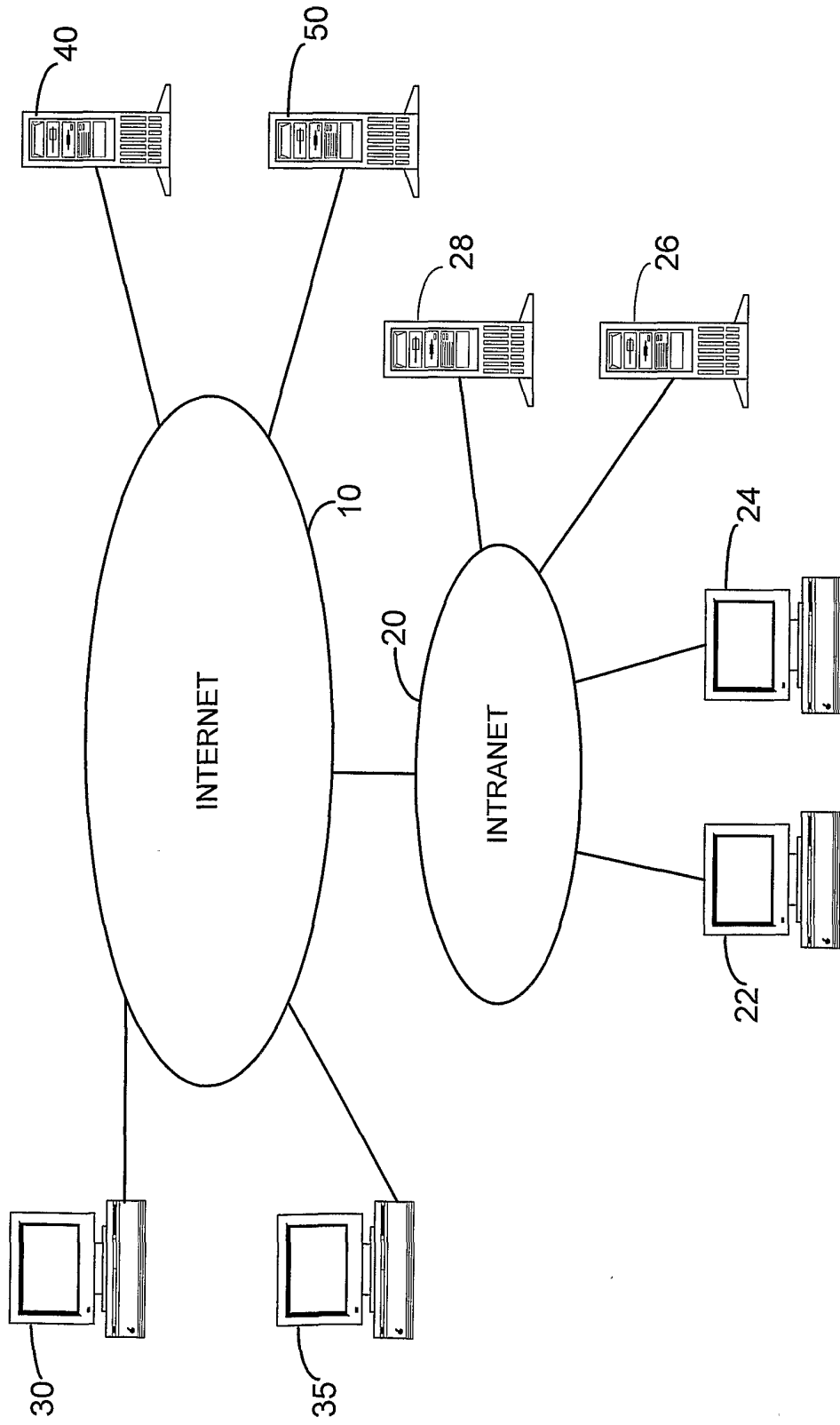


FIG. 1

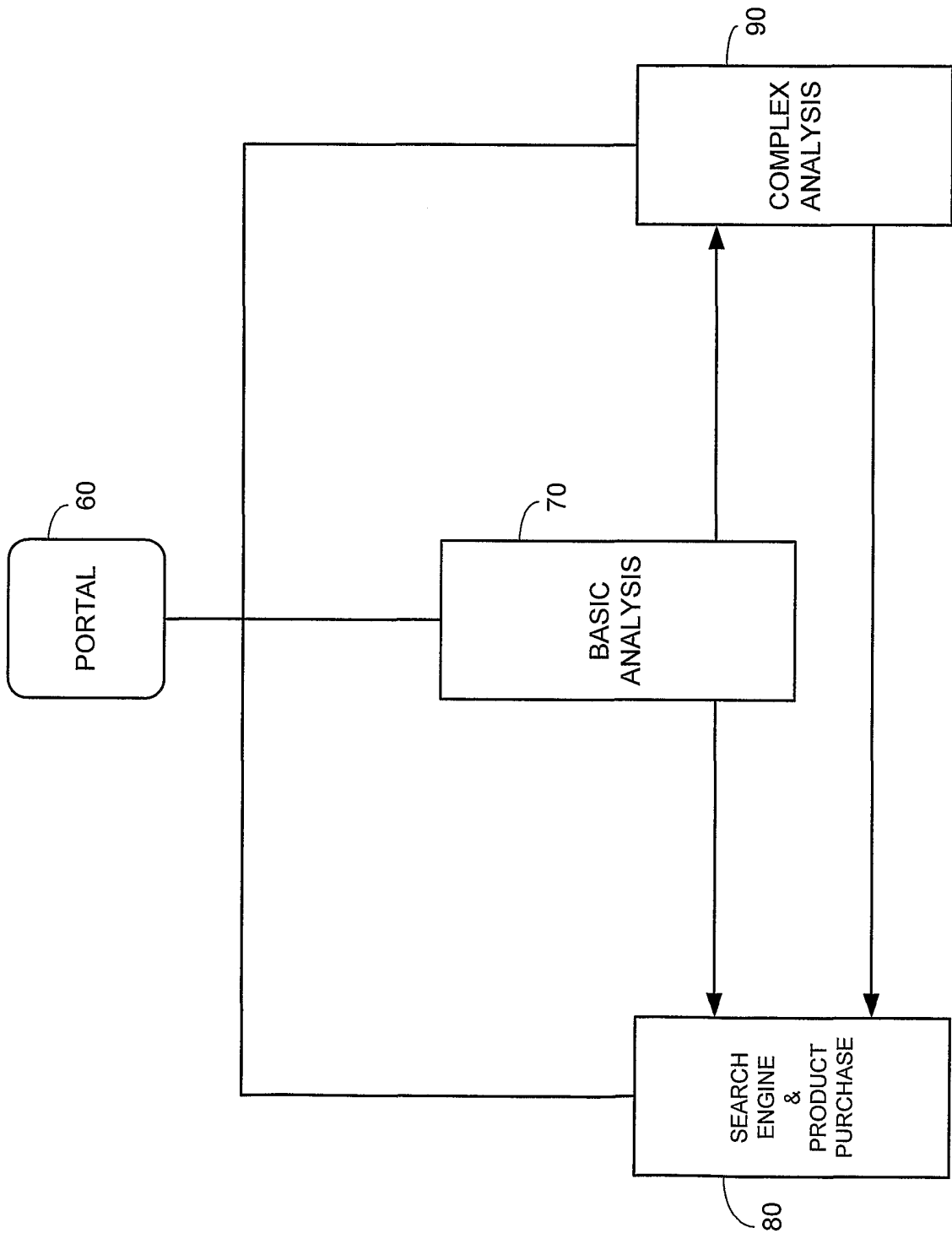


FIG. 2

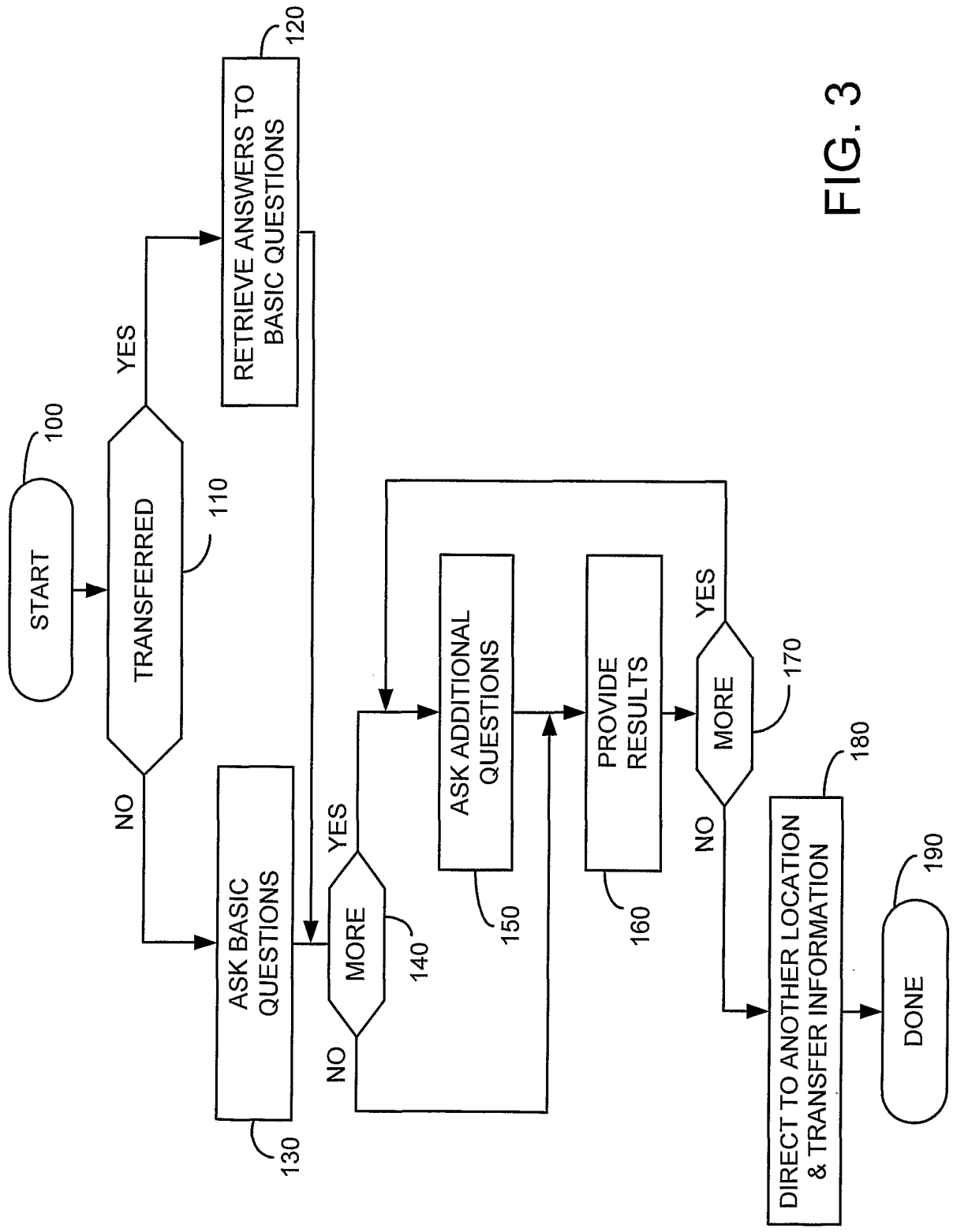


FIG. 3

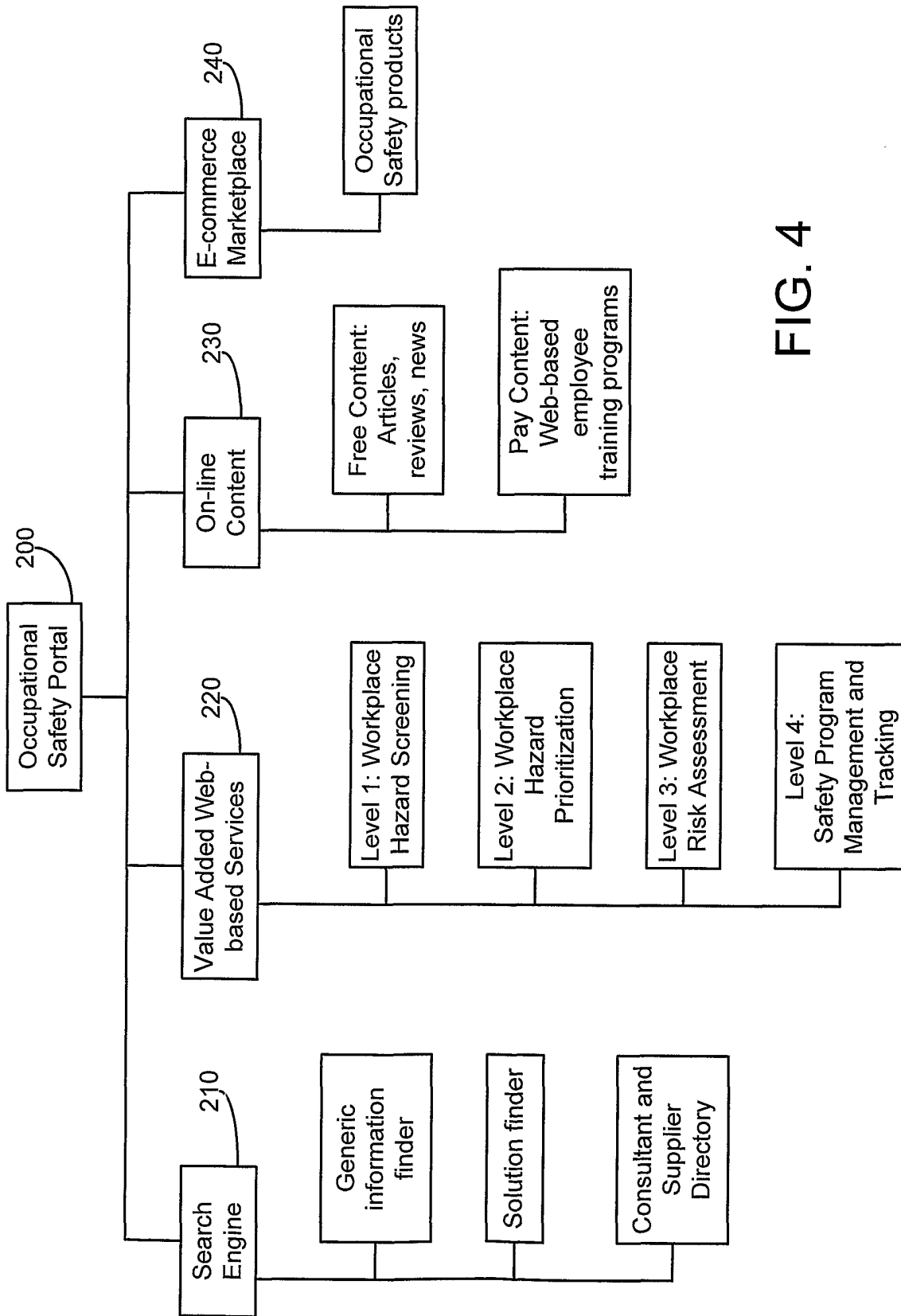


FIG. 4

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Hazard Identification Assessment

This assessment, based on the PLIBEL methodology, provides a checklist by which to test an industrial job for various ergonomic hazards. By answering a series of seventeen questions about workspace, movement and effort, this assessment determines risks and stresses to the musculoskeletal system, and will recommend products which may alleviate potential ergonomic problems.

The report for this assessment will provide a description of potential ergonomic problem areas. The Hazard Assessment will take approximately 5-10 minutes and is free of charge.

At any point in the assessment, you may choose to save the assessment if you are logged in. The Save Assessment button can be found at the bottom of the form. You may ONLY save assessments on our site if you are a registered user. Feel free to generate a report without becoming a registered user.

Job Profile Information

Name of Job _____

Job ID # _____

Job Description _____

Assessment

Assessment Name: _____

- 1. Is the walking surface uneven, sloping, slippery or nonresilient?? Yes
- 2. Is the space too limited for certain work movements or work materials? Yes
- 3. Are any tools or equipment unsuitably designed for the worker or the task? Yes
- 4. Is the working height of workspace elements (tables, desks, chairs, tools, etc.) incorrectly adjusted? Yes
- 5. Is the working chair poorly designed or incorrectly adjusted? Yes
- 6. Is the work performed while standing, with no opportunity to sit and rest? Yes
- 7. Is fatiguing foot-pedal work performed? Yes

FIG. 5A

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8. Is fatiguing leg work performed?
(check all that apply)
- a) Repeated stepping up on stool, step etc.?
 - b) Repeated jumps, prolonged squatting or kneeling?
 - c) One leg being used more often in supporting the body?
-
9. Is repeated or sustained work performed when the back is:
(check all that apply)
- a) Mildly flexed forward?
 - b) Severely flexed forward?
 - c) Bent sideways or mildly twisted?
 - d) Severely twisted?
-
10. Is repeated or sustained work performed when the neck is:
(check all that apply)
- a) Flexed forward?
 - b) Bent sideways or mildly twisted?
 - c) Severely twisted?
 - d) Extended Backwards?
-
11. If loads are lifted manually, do you notice:
(check all that apply)
- a) Periods of repetitive lifting?
 - b) Heavy loads?
 - c) Awkward grasping of load?
 - d) Awkward location of load at onset or end of lifting?
 - e) Handling beyond forearm length?
 - f) Handling below knee height?
 - g) Handling above shoulder height?
-
12. Is repeated, sustained, or uncomfortable carrying, pushing or pulling of loads performed? Yes
-
13. Is sustained work performed when one arm reaches forward or to the side without support? Yes
-
14. Is there repetition of:
(check all that apply)
- a) Similar work movements?
 - b) Similar work movements beyond comfortable reaching distance?
-
15. Is repeated or sustained manual work performed, involving:
(check all that apply)
- a) Heavy materials or tools?
 - b) Awkward grasping of working materials or tools?
-
16. Are there high demands on visual capacity? Yes

FIG. 5B

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17. Is repeated work, with forearm and hand, performed with:
(check all that apply)

- a) Twisting movements?
 b) Forceful movements?
 c) Uncomfortable hand positions?
 d) Switches or keyboards?
-

At any point in the assessment, you may choose to save the assessment if you are logged in. The Save Assessment button can be found below. You may ONLY save assessments on our site if you are a registered user. Feel free to generate a report without becoming a registered user.

Next Assessment:

[Hazard Prioritization](#)

[Ergonomic Risk Assessment](#)

Generate Report

Save Assessment

Print Assessment Form

FIG. 5C

Hazard Prioritization Assessment

Based on the RULA methodology, this assessment provides a more detailed prioritization of ergonomic risks that may result in upper limb injury in an industrial workspace. By examining zones of motion for the arms, wrists, neck, trunk and legs, as well as the force and effort exerted during these motions, a level of danger is assessed that may indicate the need for changes in an ergonomic program.

The report for this assessment will provide a numerical ranking of the severity of ergonomic risks to the upper limbs. The Hazard Prioritization will take approximately 5-10 minutes and is free of charge.

Observe the operator during several work cycles in order to select the posture for assessment. Selection may be made based on the posture held for the longest time, or where the highest loads occur. Once you have selected a posture to evaluate, select one picture from each group that comes closest to describing the posture, and for each group check any additional items that apply.

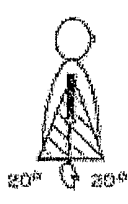
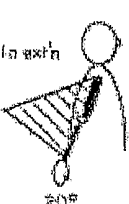


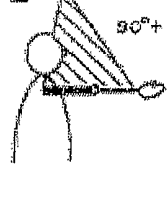
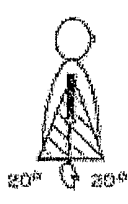
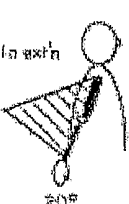


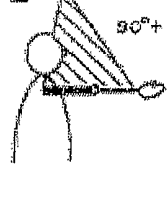
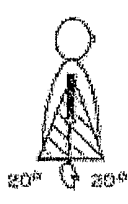
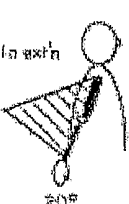


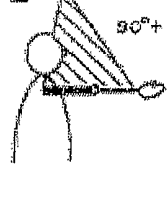
<p>Upper Arm - Right Side</p> <p>Select upper arm posture from the group below: <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E</p> <p><input type="checkbox"/> Is shoulder raised? <input type="checkbox"/> Is upper arm abducted? <input type="checkbox"/> Is the operator leaning, or is the weight of the arm supported?</p>															
<p>Upper Arm - Left Side</p> <p>Select upper arm posture from the group below: <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E</p> <p><input type="checkbox"/> Is shoulder raised? <input type="checkbox"/> Is upper arm abducted? <input type="checkbox"/> Is the operator leaning, or is the weight of the arm supported?</p>															
<table border="0"><tr><td style="text-align: center;">A</td><td style="text-align: center;">B</td><td style="text-align: center;">C</td><td style="text-align: center;">D</td><td style="text-align: center;">E</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td style="text-align: center;">20°-45°</td><td style="text-align: center;">20°</td><td style="text-align: center;">20°-45°</td><td style="text-align: center;">45°-90°</td><td style="text-align: center;">90°+</td></tr></table>	A	B	C	D	E						20°-45°	20°	20°-45°	45°-90°	90°+
A	B	C	D	E											
															
20°-45°	20°	20°-45°	45°-90°	90°+											

FIG. 6A

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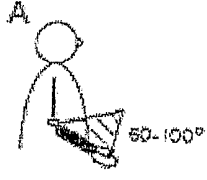
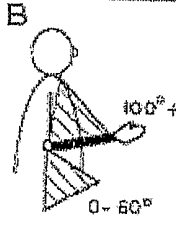
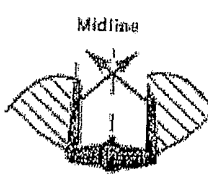
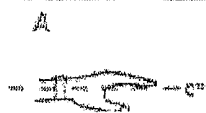

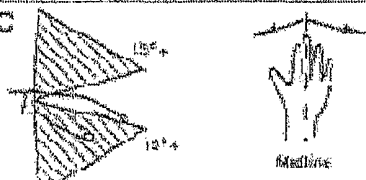
<p>Lower Arm - Right Side</p> <p>Select lower arm posture from the group below:</p> <p><input type="radio"/> A <input type="radio"/> B</p> <p><input checked="" type="checkbox"/> Is operator working across the midline of the body, or out to the side?</p>
<p>Lower Arm - Left Side</p> <p>Select lower arm posture from the group below:</p> <p><input type="radio"/> A <input type="radio"/> B</p> <p><input checked="" type="checkbox"/> Is operator working across the midline of the body, or out to the side?</p>
<p>A  50-100°</p> <p>B  100°+ 0-60°</p> <p></p>
<p>Wrist - Right Side</p> <p>Select wrist posture from the group below:</p> <p><input type="radio"/> A <input type="radio"/> B <input type="radio"/> C</p> <p><input checked="" type="checkbox"/> Is the wrist bent away from the midline?</p> <p><input type="checkbox"/> Is wrist twisted, mainly in mid-range of twist?</p> <p><input type="checkbox"/> Is wrist twisted, at or near end of twisting range?</p>
<p>Wrist - Left Side</p> <p>Select wrist posture from the group below:</p> <p><input type="radio"/> A <input type="radio"/> B <input type="radio"/> C</p> <p><input checked="" type="checkbox"/> Is the wrist bent away from the midline?</p> <p><input type="checkbox"/> Is wrist twisted, mainly in mid-range of twist?</p> <p><input type="checkbox"/> Is wrist twisted, at or near end of twisting range?</p>
<p>A </p> <p>B </p> <p>C </p>

FIG. 6B

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Rate Upper Body Muscle Use

Is the upper body posture mainly static (e.g. held for longer than 1 min.)?
 Yes No

Is the upper body posture repeated more than 4 times per minute?
 Yes No

Rate Upper Body Force

• No resistance • less than 2kg(4.5 lbs.) intermittent load or force

• 2-10kg(4.5-22.5 lbs.) intermittent load or force

• 2-10kg(4.5-22.5 lbs.) static load • 2-10kg(4.5-22.5 lbs.) repeated load or force

• 10kg(22.5 lbs.) or more static load • 10kg(22.5 lbs.) or more repeated loads or forces • shock or forces with a rapid build-up

Neck

Select neck posture from the group below:
 A B C D

Is neck twisting?
 Is neck side-bending?

A 0-10° B 10-20° C 20+ D In ext'n

Trunk

Select trunk posture from the group below:
 A B C D

Is trunk twisting?
 Is trunk side-bending?

A 0° B 0°-30° C 30°-50° D 50°+

FIG. 6C

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Legs

Are legs and feet well supported and in an evenly balanced posture? Yes
 No

Rate Lower Body Muscle Use

Is the lower body posture mainly static (e.g. held for longer than 1 min.)?
 Yes No

Is the lower body posture repeated more than 4 times per minute?
 Yes No

Rate Lower Body Force

• No resistance • less than 2kg(4.5 lbs.) intermittent load or force

• 2-10kg(4.5-22.5 lbs.) intermittent load or force

• 2-10kg(4.5-22.5 lbs.) static load • 2-10kg(4.5-22.5 lbs.) repeated load or force

• 10kg(22.5 lbs.) or more static load • 10kg(22.5 lbs.) or more repeated loads or forces • shock or forces with a rapid build-up

Assessment Name: _____

Next Assessment:
Ergonomic Risk Assessment

Generate Report	Save
Print Assessment Form	

FIG. 6D

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/20978

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(7) :G06F 17/60 US CL :705/26 According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 705/26</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,991,735 A (GERACE) 23 November 1999, col. 2, lines 10-67, col. 3, lines 1-45, col. 8, lines 30-37.	1-8, 11-18, 21-29, 32-39, 42-49, 52-60
Y	US 6,065,000 A (JENSEN) 16 May 2000, col. 1, lines 55-67, col. 2, lines 1-10.	9, 10, 19, 20, 30, 31, 40, 41, 50, 51, 61, 62
<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.</p>		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
<p>Date of the actual completion of the international search 09 SEPTEMBER 2001</p>		<p>Date of mailing of the international search report 18 OCT 2001</p>
<p>Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230</p>		<p>Authorized officer <i>Peggy Harwood</i> CHRISTOPHER L. GILLIGAN Telephone No. (703) 308-6104</p>