Title: SYSTEM AND METHOD FOR AUTOMATING THE TRANSFER OF DATA FROM A WEB INTERFACE TO A DATABASE OR ANOTHER WEB INTERFACE

Abstract: Access information is received for a data sender interface accessible over a network and a data receiver interface accessible over the network. A set of navigation steps necessary to access data fields on the sender interface are determined. The data fields on the data sender interface are automatically mapped to data fields on the data receiver interface using at least one data mapping rule, such that a set of data field mappings is created. A data transfer scenario is generated using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the receiver interface. The data transfer scenario is stored to computer readable media and can be executed any number of times to transfer data from the sending interface to the receiving interface.
Declarations under Rule 4.17:
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(H))

Published:
— with international search report (Art. 21(3))
SYSTEM AND METHOD FOR AUTOMATING THE TRANSFER OF DATA FROM A WEB INTERFACE TO A DATABASE OR ANOTHER WEB INTERFACE
SYSTEM AND METHOD FOR TELEVISION SEARCH ASSISTANT

[0001] The present application is a continuation-in-part of U.S. application Ser. No. 11/856,586 filed on Sep. 17, 2007, which claims the benefit of Provisional U.S. Patent Application Serial Number 60/844,646, filed on September 15, 2006, the entire disclosures of which are hereby incorporated by reference in their entirety.

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FIELD OF THE INVENTION

[0003] The instant disclosure relates to the field of data transfer, and in particular to a system and method for automating the transfer of data from a web interface to a database or another web interface.

BACKGROUND OF THE INVENTION

[0004] Widespread adoption of the Internet by the public and the business world has lead to increasing amounts of data and information being available on-line. Several Internet-based methods for transmitting information exist, but the method is typically chosen by the sender without input from the receiver. While the Internet was in its infancy, e-mail was the most popular means for transmitting information, whereas today, web pages are increasingly more popular means for transmitting information. Web page delivery has become popular with senders due to its cross-platform compatibility, convenience, flexibility, and ease of management. Receivers can navigate web pages to retrieve information or data using hyperlinks, buttons, arrows, or the like, which can lead to other web pages containing more information or data.

SUMMARY OF THE INVENTION

[0005] In one embodiment, is a method. Access information is received, using a computing device, for a data sender interface accessible over a network. Access information is received, using the computing device, for a data receiver interface
accessible over the network. A set of navigation steps necessary to access data fields on the sender interface are determined using the computing device. The data fields on the data sender interface are then automatically mapped, using the computing device, to data fields on the data receiver interface using at least one data mapping rule, such that a set of data field mappings is created. A data transfer scenario is generated, using a computing device, using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the receiver interface. The data transfer scenario is stored to computer readable media and can be executed any number of times to transfer data from the sending interface to the receiving interface.

[0006] In one embodiment, the invention is a computing device comprising a processor memory and a storage medium for tangibly storing thereon program logic for execution by the processor. In one embodiment, the program logic comprises: receiving logic for receiving access information for a data sender interface accessible over a network; receiving logic for receiving access information for a data receiver interface accessible over the network; navigation logic for determining a set of navigation steps necessary to access data fields on the sender interface; mapping logic for automatically mapping the data fields on the data sender interface to data fields on the data receiver interface using at least one data mapping rule, such that a set of data field mappings is created; generation logic for generating a data transfer scenario using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the receiver interface; and storing logic for storing the data transfer scenario to computer readable media. In one embodiment, the data transfer scenario can be executed any number of times to transfer data from the sending interface to the receiving interface.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0007] The foregoing and other objects, features, and advantages of the invention will be apparent from the following more particular description of preferred embodiments as illustrated in the accompanying drawings, in which reference characters refer to the same
parts throughout the various views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating principles of the invention.

[0008] FIG. 1 illustrates some embodiments of a system architecture for automating the transfer of data from a web interface to another.

[0009] FIG. 2 illustrates one embodiment of a process for automating the transfer of data from a data sender interface to a database to a data receiver interface.

[0010] FIG. 3A and 3B illustrate one embodiment of set of rules for mapping data files comprising a thesaurus.

[0011] FIG. 4 illustrates one embodiment of a mapping report displaying field mapping for multiple receiving data fields for multiple sending websites.

**DETAILED DESCRIPTION**

[0012] The present invention is described below with reference to block diagrams and operational illustrations of methods and devices to select and present media related to a specific topic. It is understood that each block of the block diagrams or operational illustrations, and combinations of blocks in the block diagrams or operational illustrations, can be implemented by means of analog or digital hardware and computer program instructions.

[0013] These computer program instructions can be provided to a processor of a general purpose computer, special purpose computer, ASIC, or other programmable data processing apparatus, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, implements the functions/acts specified in the block diagrams or operational block or blocks.

[0014] In some alternate implementations, the functions/acts noted in the blocks can occur out of the order noted in the operational illustrations. For example, two blocks shown in succession can in fact be executed substantially concurrently or the blocks can sometimes be executed in the reverse order, depending upon the functionality/acts involved.
[0015] For the purposes of this disclosure the term "server" should be understood to refer to a service point which provides processing, database, and communication facilities. By way of example, and not limitation, the term "server" can refer to a single, physical processor with associated communications and data storage and database facilities, or it can refer to a networked or clustered complex of processors and associated network and storage devices, as well as operating software and one or more database systems and applications software which support the services provided by the server.

[0016] For the purposes of this disclosure a computer readable medium stores computer data, which data can include computer program code that is executable by a computer, in machine readable form. By way of example, and not limitation, a computer readable medium may comprise computer readable storage media, for tangible or fixed storage of data, or communication media for transient interpretation of code-containing signals. Computer readable storage media, as used herein, refers to physical or tangible storage (as opposed to signals) and includes without limitation volatile and non-volatile, removable and non-removable media implemented in any method or technology for the tangible storage of information such as computer-readable instructions, data structures, program modules or other data. Computer readable storage media includes, but is not limited to, RAM, ROM, EPROM, EEPROM, flash memory or other solid state memory technology, CD-ROM, DVD, or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other physical or material medium which can be used to tangibly store the desired information or data or instructions and which can be accessed by a computer or processor.

[0017] Reference will now be made in detail to embodiments of the disclosed system and method for automating the transfer of data from a web interface to a database or another web interface, examples of which are illustrated in the accompanying drawings.

[0018] The parent application of this application, U.S. application Ser. No. 11/856,586, describes systems and methods for automating the transfer of data from a web interface to another web interface. In some embodiments, the system described in the 11/856,586 application, provides a scenario designer that enables a user to interactively map fields on
a sending web interface to fields on a receiving web interface and generate a data transfer scenario for transferring data from the sending interface to the receiving interface. In some embodiments, the 11/856,586 application additionally provides a scenario executor that transfers data from sending web interfaces to receiving web interfaces using data transfer scenarios generated by the scenario designer.

[0019] In some embodiments, this application describes an automated scenario generation process that can substantially eliminate the need for, *inter alia*, interactively mapping a sending interface to a receiving interface using a scenario designer user interface. In some embodiments, the automated scenario generation process can use network addresses of sending and receiving interfaces and a set of data mapping rules to generate a data transfer scenario that can be used by a scenario executor to transfer data from the sending interface to the receiving interface.

[0020] In some embodiments, an automated scenario generation process could be supported by a set of one or more additional functions provided by the scenario designer of the 11/856,586 application, which could be accessed through the scenario designer's user interface. Alternatively, an automated scenario designer could be a stand-alone system that generates data transfer scenarios for input into a scenario executor or other automated data transfer processes. In some embodiments, data transfer scenarios generated by an automated scenario generator could be input to the scenario designer of the 11/856,586 for revision and finalization.

[0021] FIG. 1 illustrates some embodiments of a system architecture 100 for automating the transfer of data from a web interface to another. Data is housed on at least one sender web interface 110. The sender web interface 110 is communicatively coupled with a server 120 via a private or non-private network, such as, for example, the Internet. The server 120 can also be communicatively coupled with a receiver web interface 130 or a database 140.

[0022] In some embodiments, a data transfer application, or scenario executor, running on server 120, automates the transfer of data between sender web interface 110 and receiver web interface 130 and/or database 140 by performing one or more user-defined
scripts. In some embodiments, data on sender interfaces, receiver interfaces, and databases are grouped in rows that belong to entities. Each entity owns a row of data fields, which are its attributes. In some embodiments, transfer of data is performed one row at a time. When there is a change in any of the data fields for any row, that field is transferred to the receiver database or web interface for update in that entity's record.

[0023] In some embodiments, the server 120 is also be communicatively coupled with one or more data mapping rules database 150 that can be used by an automated scenario generator to map sender web interface 110 data fields to receiver web interface fields 130 or database fields 140 and automatically generate data transfer scenarios.

[0024] The automated scenario generator and data transfer applications can comprise one or more forms, executable on a networked computing device, such as, but not limited to, compiled, stand-alone machine code, such as that written in Visual C++, Visual Basic, Delphi, or the like; run-time scripts, such as those written in JavaScript, Visual Basic Script, or the like; macros, command level files, or the like.

[0025] An automated data transfer system could be used to transfer any type of data from one interface to another. For example, a user may want to store hourly weather readings for his locale in database 140. Sender web interface 110 may comprise a weather website requiring the user to provide login credentials prior to providing weather readings. The data transfer application can automatically provide the login credentials to sender web interface 110 on an hourly basis, retrieve the weather readings, and store them in database 140, without requiring any interaction by the user.

[0026] By way of another example, without limitation, a tax advisor may wish to automatically send state lottery winners promotional materials regarding services offered by the tax advisor. In this example, sender web interfaces 110 could comprise a state lottery website displaying the lottery winners' names and hometown as well as a phone directory website, for locating the lottery winners' home address. Receiver web interface 130 would comprise a printing website that the tax advisor uses to print promotional materials. The data transfer application can periodically query the state lottery website to retrieve the name(s) of new lottery winners. After receiving the name of a new lottery
winner, the data transfer application would query the phone directory website to retrieve the lottery winner's home address. The data transfer application would then provide any necessary credentials, input the lottery winner's name and address into the printing website, and place an order to have promotional materials sent to the lottery winner. In both of the preceding examples, system architecture 100 and the scripts run by the data transfer application allow the user to transfer data between web interfaces and databases, while alleviating the burdens typically associated with doing so.

[0027] FIG. 2 illustrates a process for automating the transfer of data from a data sender interface to a database to a data receiver interface. Access information is received 210, using a computing device, for a data interface accessible over a network. Access information is received 220, using a computing device, for a data receiver interface accessible over a network. Navigation steps necessary to access information via the sender interface are determined 230 using a computing device. Fields on the data sender interface are then mapped, using the computing device, to fields on the data receiver interface 240. The navigation steps and the data field mappings are used to generate 250 a data transfer scenario. The data transfer scenario is stored 260 on a database or other computer-readable storage media. The data transfer scenario can then be executed 270 one to many times to transfer data from the sender interface to the receiver interface. These operations will now be discussed in detail.

[0028] In block 210 of FIG. 2, access information is received, using a computing device, for a data sender interface accessible over a network. In some embodiments, the data sender interface is a web site and the access information comprises a URL. In some embodiments, access information for the data sender interface additionally includes login credentials. In some embodiments, the network is the Internet and the web site is accessible over the Internet using the URL. In some embodiments, the network is a private network, for example, an intranet, and the data sender interface is a webpage accessible over the network.

[0029] In some embodiments, the data sender access information is received from a user, over a network, via a user interface. In some embodiments, the user interface provides
elements to allow the entry of URL, for a network accessible sender interface. In some embodiments, the user interface additionally provides elements to allow the entry of login credentials for access to the data sender interface. In some embodiments, the user interface is provided by a scenario designer application such as is disclosed in U.S. application Ser. No. 11/856,586. In other embodiments, data sender interface access information could be provided via automated means, such as, for example, a batch script or an automated process that identifies potential data sources on the Internet (e.g. via a web search).

[0030] In block 220 of FIG. 2, access information is received, using a computing device, for a data receiver interface accessible over a network. In some embodiments, the data receiver interface is a web site and the access information comprises a URL. In some embodiments, access information for the data sender interface additionally includes login credentials. In some embodiments, the network is the Internet and the web site is accessible over the Internet using the URL. In some embodiments, the network is a private network, for example, an intranet, and the data sender interface is a webpage accessible over the network. In some embodiments, the data receiver interface is an interface for updating a database.

[0031] In some embodiments, the data receiver access information is received from a user, over a network, via a user interface. In some embodiments, the user interface provides elements to allow the entry of URL, for a network accessible receiver interface. In some embodiments, the user interface additionally provides elements to allow the entry of login credentials for access to the data receiver interface. In some embodiments, the user interface is provided by a scenario designer application such as is disclosed in U.S. application Ser. No. 11/856,586. In other embodiments, data receiver interface access information could be provided via automated means, such as, for example, a batch script or as a default option stored in a profile.

[0032] In block 230 of FIG. 2, navigation steps necessary to access information via the sender interface are then determined 230 using a computing device. In the case where a data sender interface is a website, information of interest may be located on multiple web
pages that normally require one or more user interface actions to access the data. In one example, a website may initially display data using a summary list comprising a number of lines, where each line relates to a different person or business (e.g. a directory). More detailed information regarding the person or business may only be accessible by selecting a one of the lines on the list. In another example, information of interest may be displayed on multiple pages where navigation from page to page occurs by, for example, through a "Next" control.

[0033] A data transfer scenario needs sufficient information to navigate to interface elements that contain data of interest. This information may be gathered in a number of ways, some of which may be fully automated, and some of which may require more or less manual intervention on the part of a user. In some embodiments, data access information for the sender interface may point directly to an interface element, for example, a webpage, that contains all of the data of interest provided by the interface. In such case, no additional navigation information is required.

[0034] Commonly, however, websites are composed of multiple pages, and data of interest are located on multiple pages. In some embodiments, navigation information could be gathered by an automated process that maps all of the pages accessible through the website and identifies interface actions or links necessary to proceed from one page to another. In some embodiments, such functionality could be provided by a scenario designer operating in a batch mode. In another embodiment, the scenario designer requires control by a user.

[0035] In some embodiments, data interface navigation information could be collected by a scenario designer by monitoring user interaction with the sender web interface, such as is disclosed in U.S. application Ser. No. 11/856,586. In other embodiments, data navigation information could be gathered initially via an automated process. In another embodiment, automatically gathered information can be edited via a scenario designer user interface such as is disclosed in U.S. application Ser. No. 11/856,586. In one embodiment, data navigation information is stored on a database in association with an identification of an interface to which it relates.
[0036] In block 240 of FIG. 2, fields on the data sender interface are then automatically mapped, using the computing device, to fields on the data receiver interface. In some embodiments, the automated process uses a rule set to automatically map data values from the sender web interface to a data receiver interface or user defined variables without the need for user interaction. In some embodiments, data navigation steps for the interface are used by the mapping process to navigate from one element of the sender interface to the next for the purpose of mapping elements on each interface element (e.g. navigating through all the pages of a website and mapping fields on each page).

[0037] In some embodiments, the rule set is expressed as a thesaurus 300, such as that illustrated in FIG 3. The thesaurus comprises one or more entries, each entry comprising a receiving data field 310 and one or more sending data fields 320. The receiving data fields 310 define data fields needed by a receiving website or a receiving database. The sending data fields 320 define data fields on sending websites that may correspond to the receiving data fields 310 i.e. are synonyms for the sending data fields. The thesaurus may be created using any technique known in the art, for example, using a spreadsheet.

[0038] In some embodiments, for each sending data interface, the elements of the sending interface (e.g. pages on a website) are searched for sending data fields 320, so literally, or identified by the thesaurus. Where a sending data field 320 is found on a sending interface, it is mapped to the corresponding receiving data field for that sending interface and a data mapping rule is created. Each data mapping rule comprises an identification of one of the at least one data inputs on the receiver database or receiver web interface and at least one identification of one of the data fields on the sender web interface. For example assume the field "Assigned To" (see FIG. 3, row 1) is found on some website XYZ. That field is mapped to the receiving field "Contact"

[0039] In some embodiments, automated data mapping could be performed without user interaction. In some embodiments, automated data mapping could be performed then be presented to the user for review, modification and approval using a scenario designer user interface such as is disclosed in U.S. application Ser. No. 11/856,586 for review,
modification and approval. In one embodiment, data field mapping is stored on a
database in association with an identification of an interface to which it relates.

[0040] In some embodiments, data mapping reporting functions can additionally be
provided. FIG. 4 illustrates some embodiments of a mapping report 400. The report 410
displays field mapping for multiple receiving data fields 410 for multiple sending
websites 420.

[0041] In block 250 of FIG. 2, navigation steps and data field mappings for a sender
interface and a receiver data interface are then used to generate a data transfer scenario.
In one embodiment, the data transfer scenario comprises sufficient information for an
automated process to obtain data from the sender interface and transfer the information to
the receiver interface. In one embodiment, such information can include data field
mappings and control logic for navigating the sender interface and extracting information
from interface elements. In some embodiments, such control logic can perform loop
processing of data stored on a sender interface in a table, grid, or other similar format.

[0042] In some embodiments, data transfer scenario generation could be performed
without user interaction. In some embodiments, data transfer scenario generation could
be performed then be presented to the user for review, modification and approval using a
scenario designer user interface such as is disclosed in U.S. application Ser. No.
11/856,586 for review, modification and approval.

[0043] In block 260 of FIG. 2, The data transfer scenario is stored 260 on a database or
other computer readable media. In some embodiments, data transfer scenario generation
and data transfer scenario execution are separate processes whose only relation to one
another is through data transfer scenarios. In some embodiment, data transfer scenarios
are generated for later use by one or more automated data transfer processes, such as, for
example, a scenario executor.

[0044] In various embodiments, data transfer scenarios can take a number of different
forms. In some embodiments, data transfer scenario generation compiles executable
software which can be run by, for example, server 120 of FIG. 1 or other such device. In
some embodiments, data transfer scenario generation creates scenarios comprising
macros and routines which are executed by an automated data transfer application
installed on a server such as, for example, server 120 of FIG. 1 or other such device. In
one embodiment, data transfer scenarios are expressed as XML code that is capable of
being executed an automated data transfer application. Appendices A through F of U.S.
application Ser. No. 11/856,586 illustrate a number of exemplary XML based data
transfer scenarios.

[0045] FIG. 5 is a block diagram illustrating an internal architecture of an example of a
computing device, such server 120 of FIG. 1, in accordance with one or more
embodiments of the present disclosure. A computing device as referred to herein refers
to any device with a processor capable of executing logic or coded instructions, and could
be a server, personal computer, set top box, smart phone, pad computer or media device,
to name a few such devices. As shown in the example of FIG. 5, internal architecture
510 includes one or more processing units (also referred to herein as CPUs) 512, which
interface with at least one computer bus 502. Also interfacing with computer bus 502 are
persistent storage medium / media 506, network interface 514, memory 504, e.g., random
access memory (RAM), run-time transient memory, read only memory (ROM), etc.,
media disk drive interface 508 as an interface for a drive that can read and/or write to
media including removable media such as floppy, CD-ROM, DVD, etc. media, display
interface 510 as interface for a monitor or other display device, keyboard interface 516 as
interface for a keyboard, pointing device interface 518 as an interface for a mouse or
other pointing device, and miscellaneous other interfaces not shown individually, such as
parallel and serial port interfaces, a universal serial bus (USB) interface, and the like.

[0046] Memory 504 interfaces with computer bus 502 so as to provide information stored
in memory 504 to CPU 512 during execution of software programs such as an operating
system, application programs, device drivers, and software modules that comprise
program code, and/or computer-executable process steps, incorporating functionality
described herein, e.g., one or more of process flows described herein. CPU 512 first
loads computer-executable process steps from storage, e.g., memory 504, storage
medium / media 506, removable media drive, and/or other storage device. CPU 512 can
then execute the stored process steps in order to execute the loaded computer-executable
process steps. Stored data, e.g., data stored by a storage device, can be accessed by CPU 512 during the execution of computer-executable process steps.

[0047] Persistent storage medium / media 506 is a computer readable storage medium(s) that can be used to store software and data, e.g., an operating system and one or more application programs. Persistent storage medium / media 506 can also be used to store device drivers, such as one or more of a digital camera driver, monitor driver, printer driver, scanner driver, or other device drivers, web pages, content files, playlists and other files. Persistent storage medium / media 506 can further include program modules and data files used to implement one or more embodiments of the present disclosure.

[0048] Those skilled in the art will recognize that the methods and systems of the present disclosure may be implemented in many manners and as such are not to be limited by the foregoing exemplary embodiments and examples. In other words, functional elements being performed by single or multiple components, in various combinations of hardware and software or firmware, and individual functions, may be distributed among software applications at either the client level or server level or both. In this regard, any number of the features of the different embodiments described herein may be combined into single or multiple embodiments, and alternate embodiments having fewer than, or more than, all of the features described herein are possible. Functionality may also be, in whole or in part, distributed among multiple components, in manners now known or to become known. Thus, myriad software/hardware/firmware combinations are possible in achieving the functions, features, interfaces and preferences described herein. Moreover, the scope of the present disclosure covers conventionally known manners for carrying out the described features and functions and interfaces, as well as those variations and modifications that may be made to the hardware or software or firmware components described herein as would be understood by those skilled in the art now and hereafter.

[0049] Furthermore, the embodiments of methods presented and described as flowcharts in this disclosure are provided by way of example in order to provide a more complete understanding of the technology. The disclosed methods are not limited to the operations and logical flow presented herein. Alternative embodiments are contemplated in which
the order of the various operations is altered and in which sub-operations described as being part of a larger operation are performed independently.

[0050] While various embodiments have been described for purposes of this disclosure, such embodiments should not be deemed to limit the teaching of this disclosure to those embodiments. Various changes and modifications may be made to the elements and operations described above to obtain a result that remains within the scope of the systems and processes described in this disclosure.
CLAIMS

We claim:

1. A method comprising:

   receiving access information, using a computing device, for a data sender interface accessible over a first network;

   receiving access information, using the computing device, for a data receiver interface accessible over a second network, wherein said second network is the same as or different from said first network;

   determining, using the computing device, a set of navigation steps necessary to access data fields on the sender interface;

   automatically mapping, using the computing device, the data fields on the data sender interface to data fields on the data receiver interface using at least one data mapping rule, such that a set of data field mappings is created;

   generating, using a computing device, a data transfer scenario using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the receiver interface; and

   storing, using the computing device, the data transfer scenario to computer readable media.

2. The method of claim 1, such that the at least one data mapping rule comprises a thesaurus comprising one or more entries, each entry comprising a receiving data field and one or more sending data fields.

3. The method of claim 1, such that the data sender interface is a website, and determining a set of navigation steps comprises automatically identifying web pages accessible through the website and identifying interface actions necessary to navigate between the web pages.
4. The method of claim 1, such that the data sender interface is a website, and determining a set of navigation steps comprises monitoring user interaction with the website.

5. The method of claim 1, such that the access information for a data sender interface comprises a URL for a page on a website.

6. The method of claim 5, such that the access information for a data sender interface additionally comprises login credentials.

7. The method of claim 1, such that the access information for a data receiver interface comprises a URL for a page on a website.

8. The method of claim 1, such that the access information for a data receiver interface comprises a network address for an interface for updating a database.

9. The method of claim 1 comprising:

   executing, using the computing device, the data transfer scenario, such that data is transferred from the sender interface to the receiver interface in accordance with the data transfer scenario.

10. The method of claim 1, such that the data transfer scenario is executed automatically on a predetermined schedule.

11. The method of claim 1, such that the data transfer scenario is executed on-demand.
12. A computing device comprising:

   a processor memory;

   a storage medium for tangibly storing thereon program logic for execution
   by the processor, the program logic comprising:

      receiving logic for receiving access information for a data sender
      interface accessible over a first network;

      receiving logic for receiving access information for a data
      receiver interface accessible over a second network, wherein said second
      network is the same as or different from said first network;

      navigation logic for determining a set of navigation steps
      necessary to access data fields on the sender interface;

      mapping logic for automatically mapping the data fields on the
      data sender interface to data fields on the data receiver interface using at
      least one data mapping rule, such that a set of data field mappings is
      created;

      generation logic for generating a data transfer scenario using the
      set of navigation steps and the set of data field mappings, such that the
      data transfer scenario specifies a set of operations for transferring data
      from the sender interface to the receiver interface; and

      storing logic for storing the data transfer scenario to computer
      readable media.

13. The computing device of claim 12, such that the at least one data mapping rule
comprises a thesaurus comprising one or more entries, each entry comprising a
receiving data field and one or more sending data fields.

14. The computing device of claim 12, such that the data sender interface is a website,
and the navigation logic determines the set of navigation steps by automatically
identifying web pages accessible through the website and identifies interface actions necessary to navigate between the web pages.

15. The computing device of claim 12, such that the data sender interface is a website, and the navigation logic determines the set of navigation steps by monitoring user interaction with the website.

16. A computer-readable storage medium for tangibly storing thereon computer readable instructions for a method comprising:

   receiving access information for a data sender interface accessible over a first network;

   receiving access information for a data receiver interface accessible over a second network, wherein said second network is the same as or different from said first network;

   determining a set of navigation steps necessary to access data fields on the sender interface;

   automatically mapping the data fields on the data sender interface to data fields on the data receiver interface using at least one data mapping rule, such that a set of data field mappings is created;

   generating a data transfer scenario using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the receiver interface; and

   storing the data transfer scenario to a second computer readable media.

17. The computer-readable storage medium of claim 16, such that the at least one data mapping rule comprises a thesaurus comprising one or more entries, each entry comprising a receiving data field and one or more sending data fields.
18. The computer-readable storage medium of claim 16, such that the data sender interface is a website, and determining a set of navigation steps comprises automatically identifying web pages accessible through the website and identifying interface actions necessary to navigate between the web pages.

19. A method comprising:

   receiving access information, using a computing device, for a data sender interface accessible over a first network;

   receiving access information, using the computing device, for a database accessible over a second network, wherein said second network is the same as or different from said first network;

   determining, using the computing device, a set of navigation steps necessary to access data fields on the sender interface;

   automatically mapping, using the computing device, the data fields on the data sender interface to data fields in the database using at least one data mapping rule, such that a set of data field mappings is created;

   generating, using a computing device, a data transfer scenario using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the database; and

   storing, using the computing device, the data transfer scenario to computer readable media.

20. The method of claim 19, such that the at least one data mapping rule comprises a thesaurus comprising one or more entries, each entry comprising a receiving data field and one or more sending data fields.

21. The method of claim 19, such that the data sender interface is a website, and determining a set of navigation steps comprises automatically identifying web
pages accessible through the website and identifying interface actions necessary to navigate between the web pages.

22. The method of claim 19, such that the data sender interface is a website, and determining a set of navigation steps comprises monitoring user interaction with the website.

23. The method of claim 19, such that the access information for a data sender interface comprises a URL for a page on a website.

24. The method of claim 19, such that the access information for a data sender interface additionally comprises login credentials.

25. The method of claim 19 comprising:

   executing, using the computing device, the data transfer scenario, such that data is transferred from the sender interface to the database in accordance with the data transfer scenario.

26. The method of claim 19, such that the data transfer scenario is executed automatically on a predetermined schedule.

27. The method of claim 19, such that the data transfer scenario is executed on-demand.
28. A computing device comprising:
   
a processor memory;

   a storage medium for tangibly storing thereon program logic for execution by the processor, the program logic comprising:

   receiving logic for receiving access information for a data sender interface accessible over a first network;

   receiving logic for receiving access information for a database accessible over a second network, wherein said second network is the same as or different from said first network;

   navigation logic for determining a set of navigation steps necessary to access data fields on the sender interface;

   mapping logic for automatically mapping the data fields on the data sender interface to data fields in the database using at least one data mapping rule, such that a set of data field mappings is created;

   generation logic for generating a data transfer scenario using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the database; and

   storing logic for storing the data transfer scenario to computer readable media.

29. The computing device of claim 28, such that the at least one data mapping rule comprises a thesaurus comprising one or more entries, each entry comprising a receiving data field and one or more sending data fields.

30. The computing device of claim 28, such that the data sender interface is a website, and the navigation logic determines the set of navigation steps by automatically identifying web pages accessible through the website and identifies interface actions necessary to navigate between the web pages.
31. The computing device of claim 28, such that the data sender interface is a website, and the navigation logic determines the set of navigation steps by monitoring user interaction with the website.

32. A computer-readable storage medium for tangibly storing thereon computer readable instructions for a method comprising:

   receiving access information for a data sender interface accessible over a first network;

   receiving access information for a database accessible over a second network, wherein said second network is the same as or different from said first network;

   determining a set of navigation steps necessary to access data fields on the sender interface;

   automatically mapping the data fields on the data sender interface to data fields on the database using at least one data mapping rule, such that a set of data field mappings is created;

   generating a data transfer scenario using the set of navigation steps and the set of data field mappings, such that the data transfer scenario specifies a set of operations for transferring data from the sender interface to the database; and

   storing the data transfer scenario to a second computer readable media.

33. The computer-readable storage medium of claim 32, such that the at least one data mapping rule comprises a thesaurus comprising one or more entries, each entry comprising a receiving data field and one or more sending data fields.

34. The computer-readable storage medium of claim 32, such that the data sender interface is a website, and determining a set of navigation steps comprises automatically identifying web pages accessible through the website and identifying interface actions necessary to navigate between the web pages.
FIG. 2

200

210 Receive Data Sender Access Information

220 Receive Data Receiver Access Information

230 Determine Navigation Steps For Data Sender Interface

240 Map Data Sender Fields to Data Receiver Fields

250 Generate Data Transfer Scenario

260 Store Data Transfer Scenario

270 Execute Data Transfer Scenario
Data Field Thesaurus (300)

**Receiving Data Field (310)**

- Contact
- Optional Ref #
- Status
- Location
- Company Department
- Start Date
- End Date
- Bill Rate (High/Low)
- Pay Rate (High/Low)

**Sending Data Field (320)**

- Assigned To; Customer Account Managers; Coordinator; Owner; Distributor; Recruiter; Primary Recruiter; Pro Contact; Hiring Manager; Manager; MSP Contact; Staffing Specialist; Competency Center Specialist; Owner; Sponsor; Class Contact; Requester; Person; Staffing Manager; Posted By; Created By; Requisition Owners
- Order #: Position Pool ID#: Req ID; System ID; Client Name; Work Order #: Req #: Position #: Link/Requisition Number; Job Number; ; Reference #: Job Req #: SRID; Job Code
- Order Status; Job Status; Req. Status; Position Status; Notification Type; Worked By Activity; App. Status; Status and Auction Remaining Time; Shift Status
- Contractor Work Location; Work Location; Work Site; Location, City, State, Zip; Location Name; Position Location; Facility
- Buyer; Client Name; Client; Organization; Hiring Firm; Company; Customer; Hiring Company
- Engagement Start Date; Target Start Date; Period; Job Start Date; Proposed Start Date;
- Engagement End Date; End Date; Period; Job End Date; Proposed End Date
- Final Bill Rate; Bill Range; Maximum Rate; Target Bill Rate; Rate Range; Proposed Bill Rate; Target Rate; Net Placement Fee; Cost Rate; Maximum Bill Rate; Fee
- Pay Rate; Target Pay Rate; Base Salary

**FIG. 3A**
Title
Actual Job Title; Position Title; Job Title; Position; Role; Company Name
Job Title; Name; Internal Job Title; Collaboration Title

Openings/Fills
Positions; # Available Positions; Quantity; Positions Requested; No. of
Openings; # Associates Reqs./Filled; Quantity Needed; Number Needed;
Number Positions; Open Positions; Number of People Needed;

Description
Requirement Notes; Comment; Job Description; Skills; Requirements; Short
Description; Complete Description; Role Description; Required/Desired
Skills; Duties; Education; Additional Job Description; Description of Duties;
Qualifications Required; Summary; Job Requirements; Position
Requirements; Job Duties; Minimum Required Skills; Competencies;
Preferred Skills; Position Summary; Position Requirements; Position Skills
and Qualifications; Position Description; Department Overview; Job Duties
and Expertise; Project Description; Technical Environment; Other
Standards; Project Name;

Remarks
Education; Company Benefits; Comments; Hire Details; Work Environment;
Additional Information; Request Notes; Other Comments (viewed by all
vendors); Pre Screening Questions; Additional Instructions; Next Steps

Attachments
Job Title Doc; Hiring Specifications Required; Hiring Specifications
Preferred; Test Attached

FIG. 3B
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<th>Field Titles</th>
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**Field Titles**

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**Notes**

- Field 410 contains data relevant to the Field Titles section.
- Specific details are not provided in the image.
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<td>John Doe</td>
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<td>eWork Resources</td>
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<td>IDEMIS System</td>
<td>Recruiter</td>
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<td>Skill Set</td>
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<td>AT&amp;T Work</td>
<td>Project Name</td>
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<tr>
<td>System (e-cam)</td>
<td>Project Description</td>
</tr>
<tr>
<td>Talent Acquisition Management Solution (TAMS)</td>
<td>Project Description</td>
</tr>
<tr>
<td>Multiple Service Provider</td>
<td>Project Description</td>
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<tr>
<td>Hiring Company</td>
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**FIG. 4B**
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

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<th>IPC(8)</th>
<th>USPC</th>
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<td>719/329</td>
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</tbody>
</table>

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

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols):

<table>
<thead>
<tr>
<th>IPC(8)</th>
<th>USPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>G06F 9/44, 15/16, 7/00 (201.1.01)</td>
<td>719/329; 709/232, 201; 707/694, 809, 810</td>
</tr>
</tbody>
</table>

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

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

USPTO WEST System (US-PG-PUB, USPAT, USOCR, EPO, JPO), Google Patents, PatBase

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>A</td>
<td>US 2006/0123039 A1 (SCHEUERLE, JR. et al) 08 June 2006 (08.06.2006) entire document</td>
<td>1-34</td>
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Further documents are listed in the continuation of Box C.

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<tr>
<th>*</th>
<th>Document definition:</th>
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<tbody>
<tr>
<td>A</td>
<td>Document defining the general state of the art which is not considered to be of particular relevance.</td>
</tr>
<tr>
<td>E</td>
<td>Earlier application or patent but published on or after the international filing date.</td>
</tr>
<tr>
<td>L</td>
<td>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).</td>
</tr>
<tr>
<td>O</td>
<td>Document referring to an oral disclosure, use, exhibition or other means.</td>
</tr>
<tr>
<td>F</td>
<td>Document published prior to the international filing date but later than the priority date claimed.</td>
</tr>
<tr>
<td>T</td>
<td>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.</td>
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<tr>
<td>X</td>
<td>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.</td>
</tr>
<tr>
<td>Y</td>
<td>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.</td>
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<tr>
<td>&amp;</td>
<td>Document member of the same patent family.</td>
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Date of the actual completion of the international search: 22 April 2011

Date of mailing of the international search report: 12 MAY 2011

Name and mailing address of the ISA/US:

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer: Blaine R. Copenhaver

PCT Helpdesk: 317-272-4300
PCT OSP: 317-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)