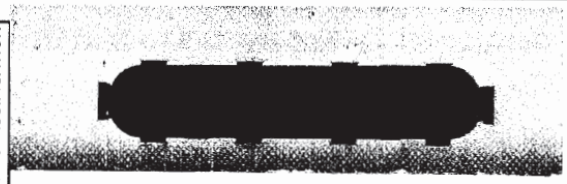
JC675 U.S. PTO
09/442089
10/21/99

Class	Subclass
707	104.1

ISSUE CLASSIFICATION



PATENT NUMBER
6308178
6308178

U.S. UTILITY PATENT APPLICATION

O.I.P.E.	PATENT DATE
TR SCANNED GHU Q.A. CS 1	OCT 2 3 2001

SECTOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
	707	100	2172	SHAHID ALAM

FILED WITH: ☐ DISK (CRF) ☐ FICHE
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PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)						
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
707	100	707	6	10	104.1			
INTERNATIONAL CLASSIFICATION		709	225	320				
G06F 17/30		717	1	5				

☐ Continued on Issue Slip Inside File Jacket

☐ TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
	6	6	1	34	23

☐ a) The term of this patent subsequent to _____ (date) has been disclaimed.	SHAHID ALAM (Assistant Examiner) 8/12/01 (Date)	NOTICE OF ALLOWANCE MAILED: 8-14-01
☐ b) The term of this patent shall not extend beyond the expiration date of U.S Patent. No. _____	HOSAIN T. ALAM PRIMARY EXAMINER (Primary Examiner) 8/13/01 (Date)	ISSUE FEE — Amount Due: $620.00 — Date Paid: 9-10-01
☐ c) The terminal ____months of this patent have been disclaimed.	(Legal Instruments Examiner) (Date)	ISSUE BATCH NUMBER: K58

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Form PTO-436A
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Formal Drawings: ____ sheet(s)

(LABEL AREA)
ISSUE FEE IN FILE

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Petitioner SAP America, Inc.
Ex. 1005

6,308,178

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

Transaction History

Date	Transaction Description
11-23-1999	Initial Exam Team nn
12-08-1999	Notice Mailed--Application Incomplete--Filing Date Assigned
01-12-2000	Information Disclosure Statement (IDS) Filed
01-12-2000	Information Disclosure Statement (IDS) Filed
02-16-2000	Application Dispatched from OIPE
02-16-2000	Application Is Now Complete
03-06-2000	Case Docketed to Examiner in GAU
02-14-2001	Case Docketed to Examiner in GAU
05-07-2001	Information Disclosure Statement (IDS) Filed
05-07-2001	Information Disclosure Statement (IDS) Filed
07-20-2001	Case Docketed to Examiner in GAU
08-13-2001	Case Docketed to Examiner in GAU
08-14-2001	Mail Notice of Allowance
08-14-2001	Notice of Allowance Data Verification Completed
08-17-2001	Workflow - File Sent to Contractor
09-10-2001	Issue Fee Payment Verified
09-10-2001	Workflow - Drawings Finished
09-10-2001	Workflow - Drawings Matched with File at Contractor
09-10-2001	Workflow - Drawings Received at Contractor
09-10-2001	Workflow - Drawings Sent to Contractor
09-21-2001	Workflow - Complete WF Records for Drawings
09-26-2001	Application Is Considered Ready for Issue
10-04-2001	Issue Notification Mailed
10-23-2001	Recordation of Patent Grant Mailed
10-23-2001	Patent Issue Date Used in PTA Calculation

09442089

JC675 U.S. PTO
09/442089
10/21/99

DEC 0 1998
INITIALS

CONTENTS

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1. Application ____ papers.		42.	
2. Rec: Letr. - decl.	12-8-99	43.	
3. IDS	1-12-00	44.	
4. Resp. decl./swrn/sm.ent.	2-7-00	45.	
5. IDS	11/22/00	46.	
6. RFQ, Corr, Fr	4-4-02	47.	
7. Civil FR	1-1-01	48.	
8. IDS	3-7-01	49.	
8/18 9. Notice Allowance	8-14-01	50.	
25 10. Drawings (6 sht(s) set	9-10-01	51.	
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ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	TT	69001	11/23/99
O.I.P.E CLASSIFIER			12-1-99
FORMALITY REVIEW	RMW	11.09.16	12-8-99
	RMW	11.09.16	2-16-00

INDEX OF CLAIMS

✔	Rejected	N	Non-elected
=	Allowed	I	Interference
—	(Through numeral) Canceled	A	Appeal
÷	Restricted	O	Objected

Claim Final	Claim Original	Date
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SEARCHED

Class	Sub.	Date	Exmr.
707	4,6,9 10,102	8/10/01	SA
	103	8/10/01	SA
709	320	8/12/01	SA
707	6		
	10		
	100		
	102		
	103		
	104.1	8/12/01	SA
709	225	8/12/01	SA
712	3	8/12/01	SA
717	1, 5	8/12/01	SA
358	1-16	8/12/01	SA

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
707	6	8/12/01	SA
	10		
	100		
	104.1		
709	225		
	320		
717	1		
	5		

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

	Date	Exmr.
Plus Search	1/30/01	SA
EIC Search	1/31/01	SA
Google Search	1/31/01	SA
EAST (Class/Subclass)	8/12/01	SA
EAST (USPAT, PGPub, EPO, JPO, Derwent, IBM TDB)	8/12/01	SA
IEEE	8/12/01	SA

(RIGHT OUTSIDE)

US006308178B1

(12) **United States Patent**
Chang et al.

(10) **Patent No.: US 6,308,178 B1**
(45) **Date of Patent: Oct. 23, 2001**

(54) **SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS**

(75) Inventors: **Chia-Pei Chang**, Chicago; **Brian J. Connolly**, Hoffman Estates; **Eric Blackledge**, Woodstock; **Robert John Hoffman**, Wheeling; **Bob Homan**, Niles; **Klaus Schulz**, Downers Grove, all of IL (US)

(73) Assignee: **Darc Corporation**, Chicago, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/442,089**

(22) Filed: **Oct. 21, 1999**

(51) **Int. Cl.**[7] **G06F 17/30**

(52) **U.S. Cl.** **707/100**; 707/6; 707/10; 707/104.1; 709/225; 709/320; 717/1; 717/5

(58) **Field of Search** 707/4, 6, 9, 10, 707/102, 103, 100, 104.1; 709/320, 225; 712/3; 717/1, 5; 358/1.16

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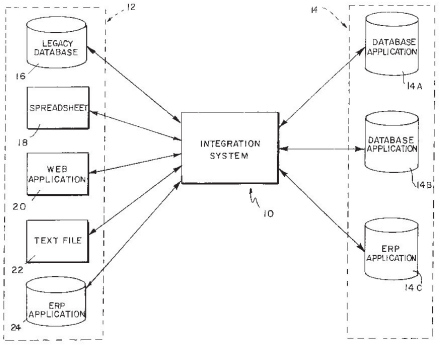
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Primary Examiner—Hosain T. Alam
Assistant Examiner—Shahid Alam
(74) *Attorney, Agent, or Firm*—Barnes & Thornburg

(57) **ABSTRACT**

A system for integrating data among heterogeneous source applications and destination applications including a knowledge repository containing temporary data storage for storing data from the source applications during processing for population in the destination applications, a library of data elements each providing a discrete data manipulation friction, configuration data storage for storing user-provided information describing the integration environment, and a plurality of add-on modules or cartridges which each include a plurality of predefined instruction sets defining chains of data elements to perform interface functions corresponding to a particular destination application. The underlying interface communication and processing functions are performed by an active component (or engine) according to the configuration data and the module instruction sets. The active component is driven by the repository data to load source data into the temporary data storage, translate, synchronize, and validate that data, then interface the data to a destination application. A configuration interface permits the user to configure the system.

34 Claims, 6 Drawing Sheets



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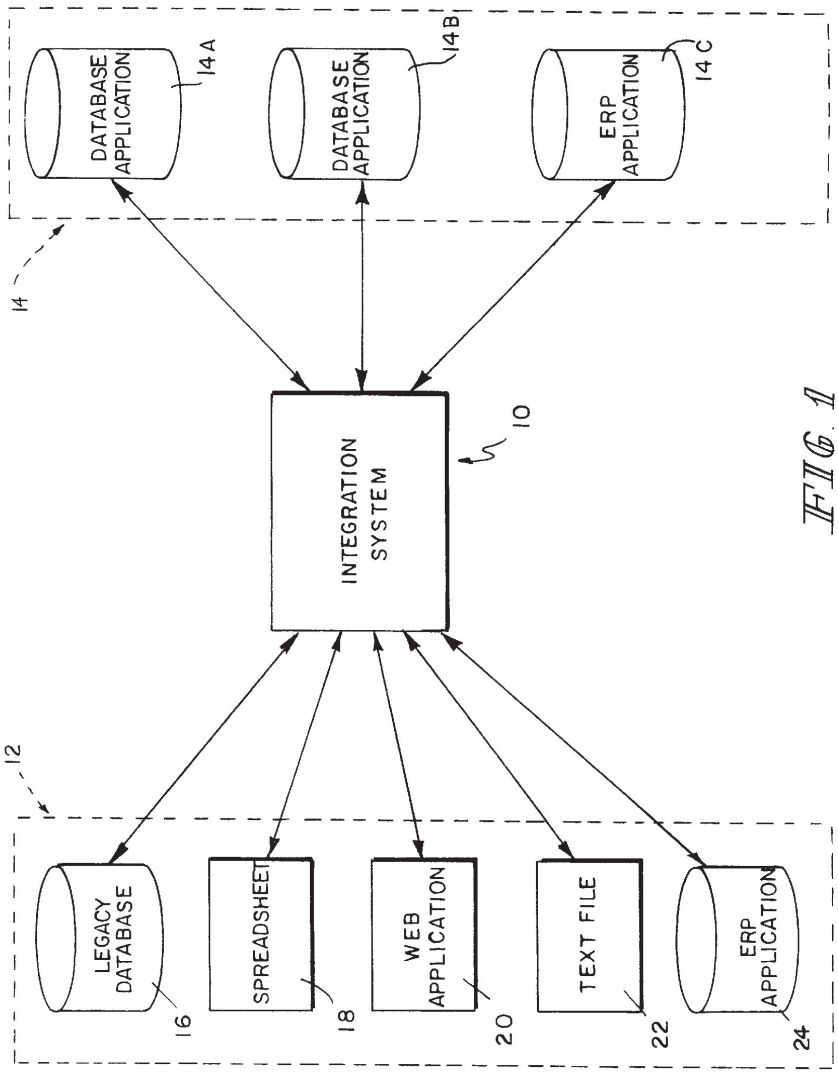
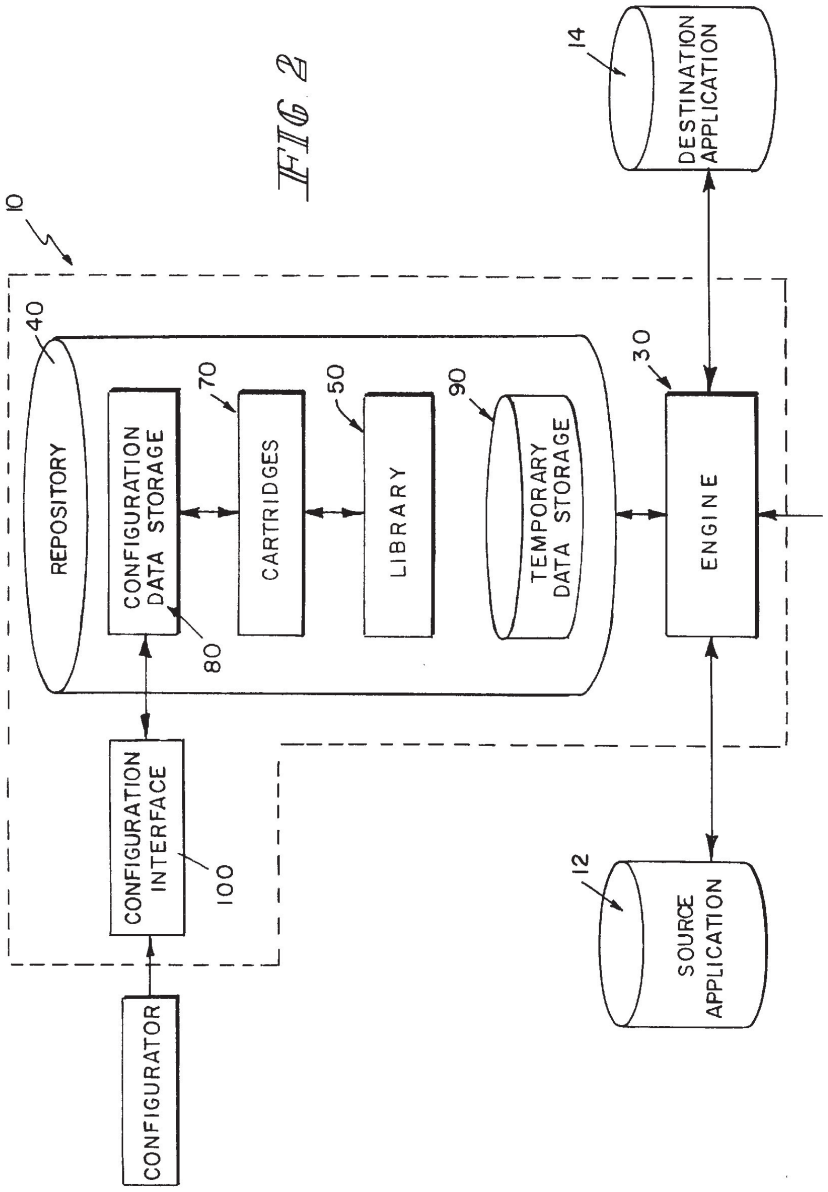

DATABASE APPLICATION
14A
DATABASE APPLICATION
14B
ERP APPLICATION
14C
14
INTEGRATION SYSTEM
10
12
LEGACY DATABASE
16
SPREADSHEET
18
WEB APPLICATION
20
TEXT FILE
22
ERP APPLICATION
24

FIG. 1

FIG 2


10
14
DESTINATION APPLICATION
40
REPOSITORY
CONFIGURATION DATA STORAGE
70
CARTRIDGES
50
LIBRARY
90
TEMPORARY DATA STORAGE
30
ENGINE
80
CONFIGURATION INTERFACE
100
12
SOURCE APPLICATION
CONFIGURATOR

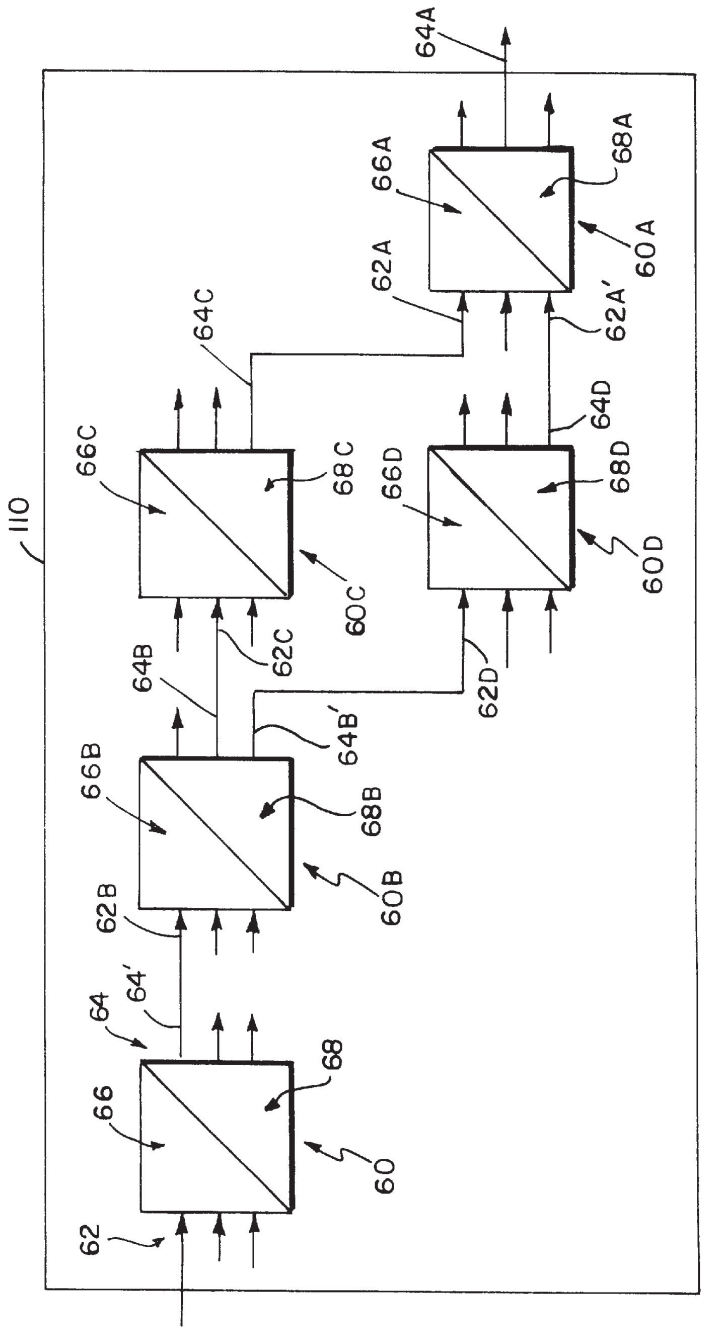

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66A
68A
60A
62A
62A'
64C
66C
68C
60C
64D
66D
68D
60D
110
62C
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64B'
66B
68B
60B
62B
64
64'
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68
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62

FIG. 3

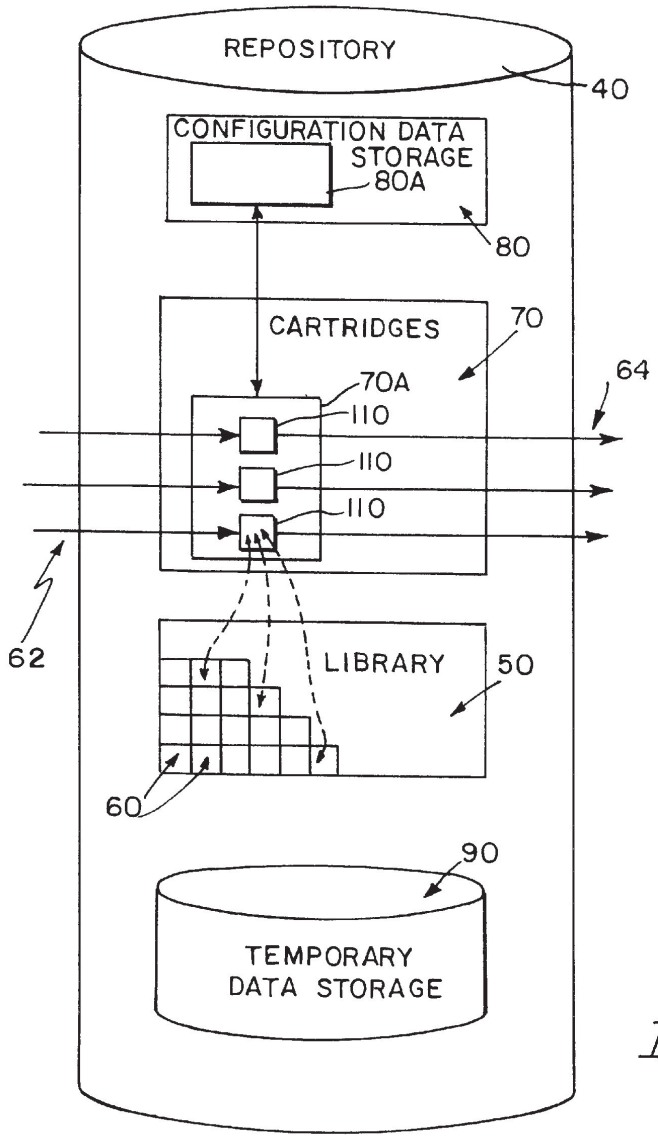
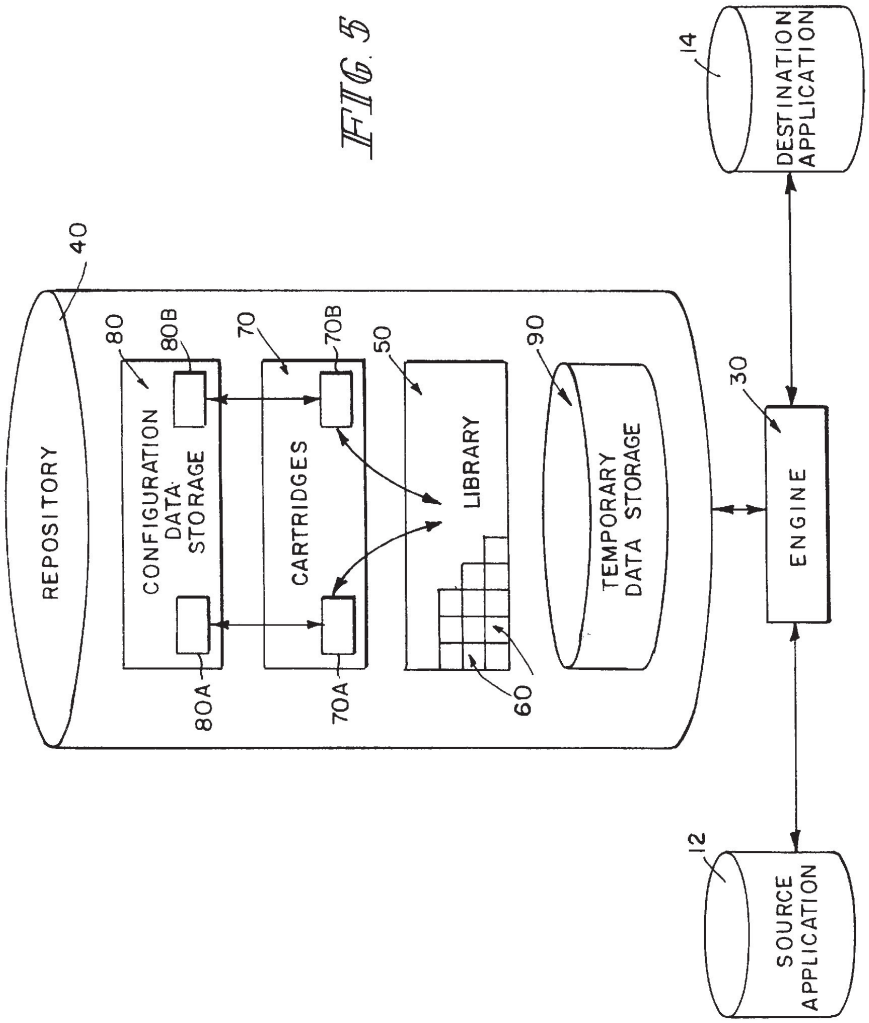

REPOSITORY
40
CONFIGURATION DATA STORAGE
80A
80
CARTRIDGES
70
70A
110
110
110
64
62
LIBRARY
50
60
90
TEMPORARY DATA STORAGE

FIG. 4

FIG. 5


DESTINATION APPLICATION
14
REPOSITORY
40
CONFIGURATION DATA STORAGE
80
80B
80A
CARTRIDGES
70
70B
70A
LIBRARY
50
60
TEMPORARY DATA STORAGE
90
ENGINE
30
SOURCE APPLICATION
12

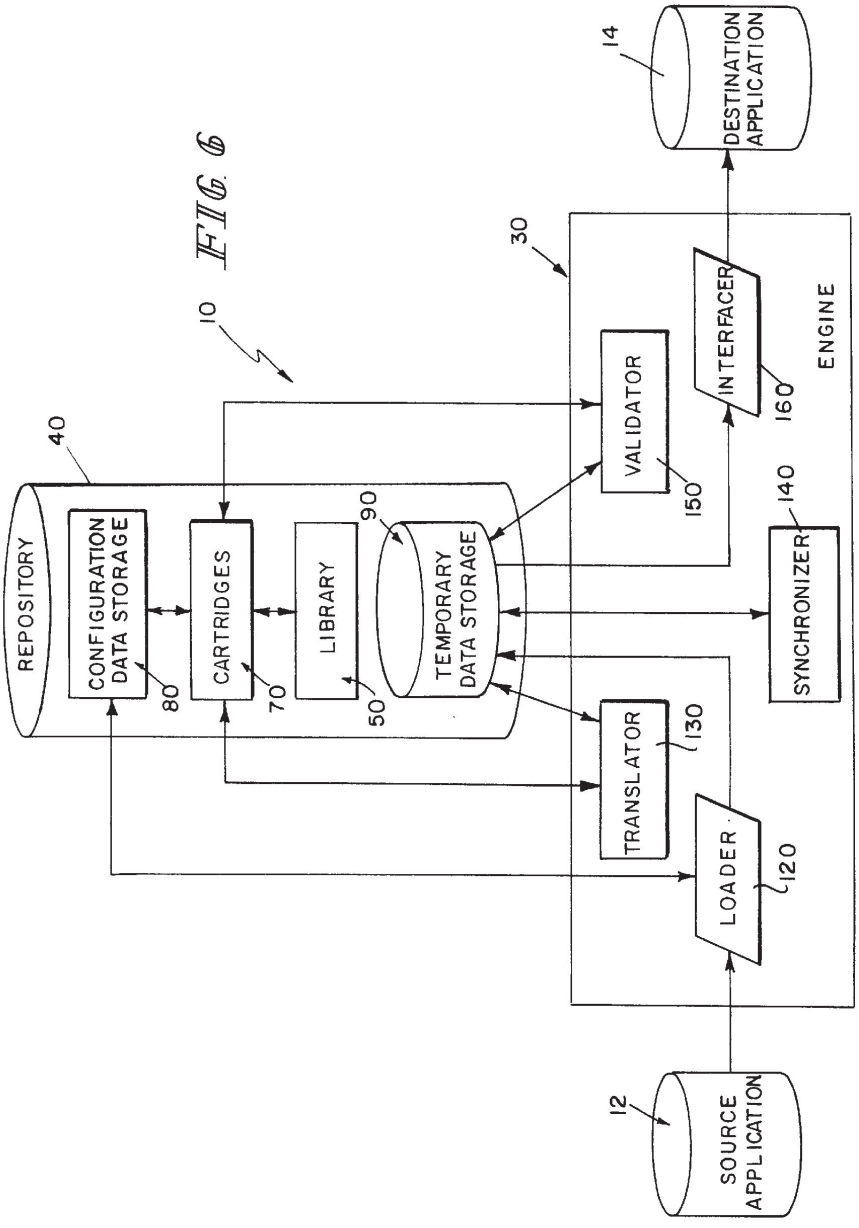

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160
SOURCE APPLICATION
DESTINATION APPLICATION
ENGINE
INTERFACER
VALIDATOR
LOADER
TRANSLATOR
SYNCHRONIZER
REPOSITORY
CONFIGURATION DATA STORAGE
CARTRIDGES
LIBRARY
TEMPORARY DATA STORAGE

FIG. 6

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

FIELD OF THE INVENTION

The present invention relates generally to Enterprise Application Integration "EAI") software, and more particularly to a configurable software system for providing migration of data among heterogeneous applications without requiring the development of code to accommodate the specific requirements of the heterogeneous applications present in a particular environment.

BACKGROUND OF THE INVENTION

EAI software is generally designed to address the need of business to integrate various business software applications employed by the diverse operating sectors of a single business organization (for example, financial operations, human resources, shipping and receiving, etc.), or by such operating sectors of multiple organizations. Over time, many organizations incorporate disparate software applications, each designed to manage a specific business function or set of functions. Accordingly, data related to these business functions is dispersed across the organization, and resides separately within the various software applications.

Unfortunately, various software applications maintain data according to different data models, such as hierarchical networks, relational models, spreadsheets, multimedia databases, knowledge databases and other types of data models. Eventually, as more and more such applications are added to an organization, the need for data synchronization (or updating) and migration among applications grows. Thus, intelligent management, manipulation, and maintenance of organization-wide data requires an integration system capable of providing data transfer interfaces among the various heterogeneous applications employed throughout the organization (or across various organizations).

One product commonly found in modem business enterprises falls within the broad category of Enterprise Resource Planning "ERP") software which generally provides packaged suites of business applications. Examples of such ERP software include offerings by Oracle Corporation, SAP, PeopleSoft, and Baan. These ERP products may replace many individual business function applications with a single, integrated suite of applications, encompassing business operations including accounting, purchasing, shipping and receiving, human resources, etc. Notwithstanding a proliferation of such consolidated products, many organizations also maintain a variety of disparate applications as described above. Additionally, many organizations employ similar or identical ERP products at geographically diverse locations. Thus, integration among these heterogeneous applications and consolidated ERP products, as well as integration among ERP products, is desirable.

Various methods of meeting the above-described integration needs presently exist. One method is the development of custom integration software to interface, for example, an organization's specific set of heterogeneous applications with the applications within the organization's ERP product. The custom integration method employs a traditional software development model wherein custom code is written specifically to operate with a fixed group of heterogeneous applications and integrate them with an ERP product of a particular version. This method is time consuming, labor intensive and expensive to implement. Moreover, after the custom code is written, implemented, and tested, it provides the required integration only so long as the environment

remains unchanged. When, for example, an updated version of the organization's ERP product is released, the custom integration software must be updated to correspond with the new version. This maintenance is also time-consuming and expensive. Additionally, because the timing of such maintenance depends entirely upon the new ERP product's release date, the associated costs are unpredictable and, therefore, difficult to budget.

Off-the-shelf, front-end integration packages, such as those provided by Cross Worlds or Constellar, are also available to address an organization's integration needs. This software is attached to the heterogeneous source applications and is used to query the source applications to obtain the desired data. Whole files are not transferred from a source application to a destination application for manipulation and use. More importantly, this front-end integration software does not directly integrate with the applications at the destination end, but instead requires a software developer to generate custom code to bridge the gap between the front-end package and the destination applications. Accordingly, this software shares some of the costs and inflexibility disadvantages inherent in custom-built interfaces.

Other integration tools, such as products like Smart dB, include templates to connect destination applications with back-end servers and source applications. These templates reduce labor costs by reducing the complexity of the overall integration task. However, such template tools are also undesirable because developers must write custom code to bridge the gap between the source applications and the templates.

SUMMARY OF THE INVENTION

The integration system of the present invention provides a flexible, end-to-end integration solution that manages all mapping, validation, and synchronization of data among heterogeneous source and destination applications within an organization and among the applications of multiple organizations. The system includes an active component (or engine) that performs the underlying communication and data processing functions, and a repository of information used by the active component relating to the characteristics of the source and destination applications. The functionality of the system is expandable through use of modules (or cartridges) that may be added to the repository as the organization's integration requirements expand. The modules are configurable, pre-built integration packages, which may be specific to a particular database application (for example, a particular application within an ERP product such as Oracle Applications). Once the repository is configured with information describing data contained within the organization's heterogeneous source applications, each module defines interface processes or instruction sets which migrate data between the source applications and a particular destination application. The active component is driven by instruction sets associated with the applicable module and other information in the repository to read and process inputs from a source application and perform the transfer of data to a destination application.

In addition to the modules, the repository includes configuration data relating to each installed module. Upon installation or expansion of a particular integration system according to the present invention, a user may activate a configuration interface provided with the system to configure the system to operate with the installed modules. During this process, configuration data is created and stored in the

configuration data storage section of the repository within a portion of the configuration data storage corresponding to the applicable module. The active component uses the configuration data to determine which instruction sets (contained within the modules) to access. The modules assemble the instructions by accessing data elements (individual units of re-usable code) stored in a repository library. Since multiple modules may access the same data elements, updates to the library data elements are universally applicable to a variety of modules.

By providing a standard interface methodology that incorporates a collection of rules describing a particular destination application, the integration system of the present invention eliminates the need for custom software and the disadvantages of the development life cycle associated therewith, reduces user learning curves by virtue of the knowledge contained within the repository, eliminates manual data entry, and provides an upgrade path to future releases of the destination application, thereby reducing the cost of ownership. Updates may be accomplished by revising the repository and adding new modules, and distributing them as replacements to all organizations employing the revised destination application.

Additional features and advantages of the present invention will become more apparent to those skilled in the art upon consideration of the following detailed description of embodiments of the invention in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram illustrating installation of the present integration system in an environment.

FIG. **2** is a block diagram of the integration system of FIG. **1**.

FIG. **3** is a block diagram illustrating an exemplary chain of data elements according to the present invention.

FIG. **4** is another block diagram of a portion of the integration system shown in FIG. **1**.

FIG. **5** is yet another block diagram similar to FIG. **4**.

FIG. **6** is a block diagram illustrating the interaction between components of the integration system shown in FIG. **1**.

DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

The embodiments described herein are not intended to be exhaustive or to limit the invention to the precise forms disclosed. Rather, the embodiments selected for description are described so that those skilled in the art may utilize their teachings.

FIG. **1** is a block diagram illustrating an installation of an integration system **10** according to the present invention to provide for migration of data among a variety of heterogeneous applications (hereinafter collectively referred to as "source applications **12**") and a variety of database applications (hereinafter collectively referred to as "destination applications **14**"). In one embodiment of the invention, system **10** is a pre-built, open application programming interface "API") which can operate as a conversion interface, providing one-time data transfer from source applications **12** to destination applications **14**, and/or a standard interface providing periodic data exchange among applications. As indicated above, destination applications **14** may include suites of business applications provided by ERP products such as those produced by Oracle Corporation, SAP, PeopleSoft and Baan. The architecture of the present invention, however, and the concepts **4088** and methodologies taught herein are equally applicable to any database application, including but not limited to those listed above. To simplify this description of the invention, destination applications **14** will be assumed to be Oracle Applications.

Source applications **12** may include any combination of legacy database applications **16**, spreadsheet applications **18**, web applications **20**, applications containing text files **22**, or even ERP applications **24**. Destination applications **14** may include any combination of database applications **14**A, **14**B and ERP applications **14**C. Because integration system **10** is configurable to correspond to source applications **12** and provides incremental functionality to accommodate use of future destination applications **14**, the system offers a flexible solution for users who desire to maintain and use the data residing in their existing source applications.

FIG. **2** depicts the basic components of integration system **10**. System **10** generally includes an active component **30** (or engine) which provides generic interface functionality, and a knowledge repository **40**. Repository **40** generally includes a library **50** having data elements **60** (as will be discussed in greater detail below), a plurality of plug-in modules **70** (i.e., software add-ons configured to operate with active component **30** to add increased functionality to system **10**), which along with library **50**, provide the business rules, instructions, and roadmaps to define interface processes and direct data migration, configuration data storage **80** containing configuration data which relates to the requirements of source **12** and destination **14** applications interfaced by a particular module **70** (i.e., "metadata" or data describing characteristics of other data), and temporary data storage **90** used by active component **30** for temporarily storing data during data processing. In one embodiment of the invention, configuration data of configuration data storage **80**, data elements **60** of library **50**, and temporary data of temporary data storage **90** are all stored as Oracle tables within a relational database represented by repository **40**. Other formats for maintaining this information may be employed by one of ordinary skill in the art. Accordingly, this invention is not to be limited to the information storage format described herein.

Repository **40** essentially stores business logic that may relate to the entire suite of applications **14** available at the destination end of system **10**. This business logic (or sets of rules) describes the structure and basic functionality of the destination applications **14**, and includes a plurality of shareable components (data elements **60**) which are used to migrate data to the destination applications **14**. Modules **70** use data elements **60** to perform application-related operations.

Configuration data storage **80** may include information describing the source of the input data, the inputs to include with an interface, directions for processing and transforming data, extensions to a particular module **70**, additional validation rules, data synchronization instructions, and workflow instructions as will be described in greater detail below. Configuration data storage **80** is created using a configuration interface **100** consisting of a series of interactive screens which permit the user to input the above-described information to set-up and install an interface between source **12** and destination **14** applications. Using configuration interface **100**, source inputs (corresponding to data residing in source applications **12**) are defined. The user may also select from the available inputs in source application **12** known by module **70** being installed.

Configuration interface **100** also permits the user to define the properties of temporary tables stored in temporary data

storage **90** of repository **40** which are used by active component **30** as it processes data migrating between a source **12** and destination **14** application. These tables, in one embodiment, are physical tables given a user-defined name, having columns which include all relevant inputs from source application **12**, all outputs to destination application **14**, and all relevant inputs and outputs of data elements **60** used by modules **70**. Each module **70** includes a list of predefined tables that are configured to work with the relevant destination application **14** that will receive the inputs. For example, a purchase order Oracle Application module **70** includes tables for headers, line items, shipment information, and so on. Configuration interface **100** displays screens listing the tables available for any particular module **70**. The user may select some or all of the predefined tables to be populated with the input data. It should be understood, however, that by incorporating additional functionality in the library **50**, modules **70**, or active component **30**, the "staging area" or "workspace" provided by temporary data storage **90** may be eliminated. Finally, the user may select a table in destination application **14** that will receive the data. Each predefined table associated with each module **70** includes a list of compatible Oracle tables that can accept the inputs of the temporary tables stored in temporary data storage **90**.

Configuration interface **100** additionally permits the user to specify information about the files that will send the inputs to the predetermined tables of temporary data storage **90**. By filling out information on the screens presented by configuration interface **100**, the user may specify, for example, the length of fields located within a particular file of source application **12**, the organization of the data and header information within the file, and how the datafields will be separated if they are not of fixed lengths. Since according to one embodiment of the invention, modules **70** are configured to correspond with Oracle destination applications **14**, if source application **12** is an Oracle database, system **10** communicates with the source application directly using SQL*Net (an Oracle program that permits communication over a network between a client and database server). If source application **12** is not an Oracle database, system **10** communicates with source application **12** to transfer data into files which system **10** transfers to tables in temporary data storage **90**, and then to destination application **14** as will be described in greater detail below. Of course, by incorporating modifications to active component **30** according to principles well known in the art, a variety of inputs may be acceptable to system **10**, for example, inputs in XML or EDI format, or any other format.

The user may purchase system **10** including the components illustrated in FIG. **2** with modules **70** corresponding to those required for interface with the user's presently-used destination applications **14**. For example, if the user runs Oracle Applications, the user may select from a variety of available modules pre-built to permit interface with one of the plurality of business applications packaged within Oracle (i.e., vendors, employees, items, purchase orders, receipts, customers, bills of material, accounting, manufacturing, supply chain, projects, human resources and sales). The user may choose between providing information describing its present source applications **12** to a developer or manufacturer of integration system **10** in order to facilitate pre-installation configuration of system **10** to operate with modules **70**, or conducting on-site system configuration using configuration interface **100** as described above. As the user incorporates additional destination applications **14**, additional modules **70** may be purchased and configured to provide interfaces among source applications **12** and newly incorporated destination applications **14**. Consequently, integration system **10** according to the present invention requires no generation of custom software at the initial installation stage or at the upgrade stage, but instead uses a pre-packaged active component **30** with off-the-shelf modules **70** and is configurable to operate with the modules using the configuration interface **100** set-up process described herein.

Once interfaces are configured using the above-described process, the user may set up a destination application **14** to, for example, invoke integration system **10** on a periodic basis to insure that the data residing in destination application **14** is consistent with the data in source applications **12**. For example, if inventory information is maintained on a spreadsheet source application **12** and modified as the inventory status changes throughout the day, and the inventory destination application **14** provided by Oracle is invoked to produce an inventory report on the following day (or after hours at the end of a particular day), the Oracle Inventory Application **14** may be configured to invoke integration system **10**, thereby initiating data migration from spreadsheet application **12** to Oracle Inventory Application **14**. As should be apparent from the foregoing, such data migration may occur periodically according to a predetermined schedule as described above, or be event-driven (for example, initiated by receipt of input data) or initiated manually, upon command of the user.

Referring now to FIGS. **3** and **5**, each data element **60** within library **50** includes a combination of related inputs **62**, related outputs **64**, rules for translation and mapping (mapping rules **66**), and rules for data validation (validation rules **68**). These data elements **60** essentially consist of reusable code or units of work that perform a discrete data manipulation function, and may be shared among interfaces defined by modules **70**. The data elements **60** are accessed and assembled into combinations of data elements (data element chains **110**) when module **70** executes a function.

FIGS. **4** through **6** illustrate the interaction between integration system modules **70**, configuration data storage **80**, and data element library **50**. As indicated above, each module **70** is an add-on software cartridge which corresponds to a destination application **14**. As indicated in FIGS. **4** and **5**, each module **70**A, **70**B communicates with a portion of configuration data **80**A, **80**B, respectively, contained within configuration data storage **80** of repository **40**, and repository library **50**, containing a plurality of individual data elements **60**. When active component translator **120** or validator **150** requests instructions from a particular module **70**A for processing data in an interface table in temporary data storage **90**, that portion of the active component **30** provides an input **62** to module **70**A which module **70**A interprets as a request for instructions to control that portion's process in achieving an output. Module **70**A provides an instruction set for achieving the output which then calls upon a series of data elements **60** within library **50** to perform individual tasks that may be common to a variety of modules **70**. Essentially, each module **70** includes a plurality of linked pointers to particular data elements **60** which together process input **62** to achieve desired output **64**. Information regarding the data from source application **12** necessary to carry out this processing resides in configuration data portion **80**A corresponding to the particular module, and is accessed by module **70**A during this processing.

As depicted in FIG. **3**, each data element **60** of a data element chain **110** (resulting from a chaining process carried

out by cartridge **70**) may include a plurality of related inputs **62**, a corresponding plurality of related outputs **64**, and mapping rules **66** and validation rules **68** typically applied to inputs **62** to generate outputs **64** which are validated within the data element. Outputs **64** of each data element **60** can populate a target column within a destination application **14**, such as output **64**A of data element **60**A, operate as an input **62** for other data elements **60**, such as outputs **64**B, **64**B', **64**C, **64**D of data elements, **60**B, **60**C, **60**D, or determine the context in which other data elements **60** are to be used.

With an understanding of the characteristics of the data used by a particular destination application **14**, chains **110** of data elements **70** may be constructed such that a variety of disparate inputs **62** to data element chain **110** can be processed to produce an appropriate output **64**. In the example illustrated in FIG. **3**, input **62** to data element **60** is mapped and validated as an output **64**' which data element **60**B receives as input **62**B. The mapping and validation rules **66**B, **68**B incorporated in data element **60**B produces two outputs **64**B, **64**B' which are used as inputs **62**C, **62**D to data elements **60**C and **60**D, respectively. Each of data elements **60**C, **60**D produces a single output **64**C, **64**D, respectively, which is combined with the output of the other as inputs **62**A, **62**A' to data element **60**A. Data element **60**A maps and validates inputs **62**A, **62**A' to produce a single output **64**A which will ultimately be used to populate a data table within destination application **14**.

FIG. **4** illustrates multiple data element chains **110** (representing multiple module instruction sets) contained within a single module **70**A, each accessing a plurality of data elements **60**, many of which may be common to each data element chain **110**, for producing a desired output **64**. Each module **70**A may execute a variety of chaining processes, creating complex,"virtual" data elements by connecting the input **62** and output **64** of several simple data elements **60** to provide a series of possible interface functions that may be requested of module **70**A depending on the destination application **14** to which module **70**A relates. As should be apparent from the foregoing, modules **70** do not actually contain data elements **60**, but rather contain information describing where they may be found in library **50**.

For example, an input from a source application **12** may correspond to the name of a particular contact individual within an organization. After configuration data storage **80** of repository **40** has been configured to recognize the contact name data from source application **14**, and the contact name data has been loaded into an interface table within temporary data storage **90** of repository **40**, data element chain **110** may be called upon by active component **30** to provide appropriate profile information related to the contact (or the contact's organization) acceptable for population in a table within destination application **14**. Data element **60** of data element chain **110** may receive the data as input **62** through translator **130** (as described in greater detail below) and, by consulting configuration data portion **80**A associated with the particular module **70**A, may recognize that the contact name data within source application **12** includes the first, middle, and last name of the contact all within one field. Because module **70**A may be configured to operate with a particular destination application **14**, appropriate data elements **60** will be chained to convert source application **12** contact name data into a format acceptable to destination application **14**. This format may include a contact number which corresponds to the contact's last name. Accordingly, input **62** to data element **60** may be mapped by mapping rules **66** to provide an output **64**' which consists of the contact's last name. Output **64**' is provided as an input **62**B to data element **60**B. Mapping rules **66**B within data element **60**B convert the data representing the contact's last name into a number used to identify the contact in various tables throughout destination application **14**. This contact number is provided as output **64**B. Additionally, input **62**B produces an output **64**B' which corresponds to an organization number representing the organization to which the contact individual belongs. Output **64**B is provided as input **62**C to data element **60**C. Similarly, output **64**B' is provided as input **62**D to data element **60**D. Data element **60**C accesses contact profile information located in a table of destination application **14** corresponding to the contact name present as input **62**C. Output **64**D of data element **60**D corresponds to profile information associated with the organization number present at input **62**D. Outputs **64**C, **64**D are provided as inputs **62**A, **62**A' of data element **60**A. Mapping rules **66**A of data elements **60**A provide for one-to-one mapping of input **62**A or input **62**A'. Validation rules **60**A associated with data element **60**A access yet another Oracle table in destination application **14** to determine whether, given the context of the present operation, the contact profile information is valid. Data elements **60**A may include instructions, for example, which require that in the context of the present transaction, the presence of both contact number input **62**A and organization number input **62**A' require an output of the organization number at output **64**A.

Additional data elements **60** in other chains **110** may be called upon by module **70**A to reconcile differences in the input data, such that the output is usable by destination application **14**. For example, data element **60** may be invoked which maps an input **62** of an organization name including "Inc." to an output **64** of the organization name without "Inc." Since the units of work represented by each data element **60** may be applicable to a variety of chains **110** within various modules **70** (i.e., the first step in a variety of operations may be to strip the "Inc." from an input organization name), data elements **60** within library **50** may be used by a variety of modules **70** depending upon the configuration of the instruction sets or chains **110** within the module. Accordingly, modifications relating to a variety of destination applications **14** may be accommodated by relatively few changes to the appropriate data elements **60** within library **50** that will be called upon by the plurality of modules **70** directing interface to the destination applications **14**.

In operation, when destination application **14** requests data held in a file or database residing in source application **12**, for example, an appropriate module **70** corresponding to the particular destination application **14** responds to the data request from the destination application **14** by instructing active component **30** to obtain or receive data from source application **12**. Module **70** assembles these instructions in response to the input data request by compiling various data elements **60** within repository library **50** (FIGS. **4** and **5**) according to the predetermined instruction sets designed into the module. Modules **70** then instruct active component **30** to process the data, as described in greater detail below, such that it is transferable and useable by destination application **14**.

The standard methodology for accomplishing data migration from source application **12** to destination application **14** is illustrated schematically in FIG. **6**. As shown in FIG. **6**, integration system active component **30** includes a loader **120**, a translator **130**, a synchronizer **140**, a validator **150**, and an interfacer **160**. Upon receipt of appropriate command sets corresponding to, for example, a request for data stored in source application **12**, loader **120** communicates with

configuration data storage **80** of repository **40** to determine the characteristics of the source data and the specific manner in which the data should be loaded into temporary data storage **90** in the repository. Loader **120** then reads or receives the data from source application **12**, and populates the appropriate table in temporary data storage **90**.

Next translator **130** communicates with the appropriate module **70** corresponding to destination application **14** to obtain instructions for translating the source data into destination data for updating tables within temporary data storage **90**. During this process, integration system **10** performs a net change function wherein synchronizer **140** accepts as inputs all data loaded by loader **120**, but compares these data inputs to data residing in destination application **14** and returns only those data inputs that have been updated, deleted, or are new relative to the previous execution of the same data migration process. This net change function insures that all data modifications in source application **12** are correctly represented in destination application **14** at the end of each run. Of course, integration system **10** may be configured to accept as inputs only inserted, updated, or deleted data from source application **12** relative to destination application **14**. Under this configuration, source application **12** is utilized to determine the differences between the data as it exists during the present run and as it existed during the prior run of integration system **10**.

Validator **150** of active component **30** next communicates with the appropriate module **70** in repository **40** to determine whether the data residing in the active interface table of temporary data storage **90** has been properly translated and processed, such that its content is consistent with the configuration parameters residing in configuration data storage **80** associated with module **70**, and its format is appropriate for populating destination application **14**. Upon detecting errors, validator **150** marks records as being invalid and generates a report for transmission to destination application **14**. After the data from source application **12** has been loaded, translated, synchronized, and validated, interfacer **160** moves the data from the interface table of temporary data storage **90** into an appropriate table residing in destination application **14**.

While this application has been described as having exemplary embodiments, this application is intended to cover any variations, uses, or adaptations using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within the known or customary practice within the art to which it pertains. The spirit and scope of the invention are to be limited only by the terms of the appended claims.

What is claimed is:

1. A system for integrating data among heterogeneous source applications and destination applications, comprising:

a repository of information relating to the source applications and the destination applications, the repository including a plurality of data elements each being capable of performing a discrete operation on a piece of data, and a first module including a plurality of instruction sets, each instruction of each instruction set activating a data element; and

an active component connected to the repository having an input for loading data from the source applications, and an output for populating the destination applications with processed data, the active component processing the data from the source applications by activating data elements according to the plurality of instruction sets in the module.

2. The system of claim **1** wherein the plurality of instruction sets are predefined to facilitate interface with a particular destination application.

3. The system of claim **1** further comprising a second module including a plurality of instruction sets, each instruction of each instruction set activating a data element, the first module plurality of instruction sets being defined for interface with a first group of destination applications, the second module plurality of instruction sets being defined for interface with a second group of destination applications.

4. The system of claim **3** wherein at least one data element of the plurality of data elements is activated by both the first module plurality of instruction sets and the second module plurality of instruction sets.

5. The system of claim **3** wherein the repository further includes configuration data storage for storing configuration data describing data in the source applications, the configuration data storage including a first portion used by the first module and a second portion used by the second module.

6. The system of claim **1** wherein the temporary data and the data elements are stored in a relational database.

7. The system of claim **1** wherein the repository is capable of receiving a plurality of modules.

8. The system of claim **1** wherein the destination applications are included within an ERP product.

9. The system of claim **1** wherein the active component is capable of loading entire files from a source application.

10. The system of claim **1** wherein the repository further includes a library for storing the plurality of data elements.

11. The system of claim **1** wherein the repository further includes temporary data storage for storing data temporarily as the data is being processed for introduction into a destination application.

12. The system of claim **11** wherein the first module includes a plurality of predefined tables which are selectably installed in the temporary data storage to receive temporary data, each of the predefined tables being configured for compatibility with a destination application.

13. The system of claim **12** wherein each predefined table includes a plurality of selectable destination tables residing within the destination applications which are compatible with the predefined table.

14. The system of claim **11** wherein the repository further includes configuration data storage for storing configuration data describing data in the source applications and data in the temporary data storage, the active component loading data from the source applications into the temporary data storage according to the configuration data.

15. The system of claim **14** further comprising a configuration interface for generating the configuration data, the configuration interface providing a series of screens to assist the user in describing the source applications.

16. The system of claim **14** wherein the active component input is a loader which reads data in a source application and populates the temporary data storage with the source application data according to the configuration data.

17. The system of claim **14** wherein the active component further includes a validator which communicates with the module to verify that the data residing in the temporary data storage is consistent with the configuration data associated with the module and properly formatted for populating the destination application.

18. The system of claim **1** wherein the active component may be activated by the destination application to integrate data periodically according to a predetermined schedule.

19. The system of claim **1** wherein each of the plurality of data elements includes related inputs, related outputs, mapping rules, and validation rules.

20. The system of claim 19 wherein each of the data element outputs may populate a destination application, provide an input to another data element, or indicate the context of another data element's operation.

21. The system of claim 1 wherein the active component further includes a translator which communicates with the module to translate data from the source application into data acceptable to the destination application according to the plurality of instruction sets in the module.

22. The system of claim 1 wherein the active component further includes a synchronizer which compares the data loaded from the source application into the temporary storage to data residing in the destination application and returns to the temporary data storage only data which differs from the data residing in the destination application.

23. A system for integrating data among heterogeneous source applications and destination applications, comprising:

configuration data storage for storing configuration data relating to the source applications;

temporary data storage for storing temporary data being integrated among the source and the destination applications;

a library of data elements, each data element performing a predefined function;

a first module including a plurality of instruction sets, each instruction set specifying a plurality of data elements to form a chain of data elements; and

an active component operably associated with the configuration data storage, the temporary data storage, the library, and the first module, the active component including a loader for loading data from the source applications to the temporary data storage according to the configuration data relating to the source applications, and an interfacer for populating the destination applications with data from the temporary data storage after the data is processed by the active component, the active component processing the data by communicating with the first module and activating data element chains according to instruction sets of the first module.

24. The system of claim 23 wherein the plurality of instruction sets of the first module are configured to operate with a particular destination application.

25. The system of claim 23 further comprising a second module including a plurality of instruction sets specifying chains of data elements, at least one of the data elements specified by the instruction sets of the first module also being specified by the instruction sets of the second module.

26. The system of claim 23 wherein the configuration data, the temporary data, and the data elements are stored in a relational database.

27. The system of claim 23 wherein the first module includes a plurality of predefined tables which are selectably installed in the temporary data storage, each predefined table being capable of receiving data from a source application.

28. The system of claim 27 wherein each predefined table is configured for compatibility with a destination application.

29. The system of claim 23 wherein each of the data elements includes inputs, outputs, mapping rules, and validation rules.

30. The system of claim 23 further comprising a configuration interface including a series of screens for permitting the user to describe the source applications, the configuration interface generating configuration data relating to the source applications.

31. The system of claim 23 wherein the active component further includes a validator which communicates with the first module to verify the content and format of the temporary data against the configuration data.

32. The system of claim 23 wherein the active component further includes a translator which communicates with the first module to translate data from the source applications according to the data element chains.

33. The system of claim 23 wherein the active component further includes a synchronizer which carries out a net change function wherein the synchronizer compares data in the destination applications to the temporary data and updates the temporary data such that the temporary data reflects the differences between the temporary data and the data in the destination applications.

34. A data integration system for providing end-to-end integration between a plurality of source applications and a destination application, the system comprising:

repository means for containing information relating to the source applications and the destination application, the repository means including temporary storage means for storing temporary data from the source applications, configuration storage means for storing configuration data describing data in the source applications and in the temporary storage means, library means for storing a plurality of data element means for performing data interface functions, each of the data element means being capable of performing a single data interface function, and module means for providing instructions for executing predefined series of data element means; and

active component means for moving data from the source applications to the temporary storage means, processing the data according to the module means instructions, and populating the destination application with resulting data residing in the temporary storage means.

* * * * *

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APPLICANT

CHIA-PEI CHANG, CHICAGO, IL; BRIAN J. CONNOLLY, HOFFMAN ESTATES, IL; ERICK BLACKLEDGE, WOODSTOCK, IL; ROBERT JOHN HOFFMAN, WHEELING, IL; BOB HOMAN, NILES, IL; KLAUS SCHULZ, DOWNERS GROVE, IL.

CONTINUING DOMESTIC DATA********
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☐yes ☒no ☐yes ☐no ☐Met after Allowance Verified and Acknowledged SA (Examiner's Initials) _____ (Initials)	IL	6	34

ADDRESS

ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

TITLE

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

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09/442,089	10/21/1999 RULE _	707	2771	20742/54088

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APPLICANTS

CHIA-PEI CHANG, CHICAGO, IL ;
BRIAN J. CONNOLLY, HOFFMAN ESTATES, IL ;
ERIC BLACKLEDGE, WOODSTOCK, IL ;
ROBERT JOHN HOFFMAN, WHEELING, IL ;
BOB HOMAN, NILES, IL ;
KLAUS SCHULZ, DOWNERS GROVE, IL ;

** CONTINUING DATA **********

** FOREIGN APPLICATIONS **********

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** SMALL ENTITY **

Foreign Priority claimed	35 USC 119 (a-d) conditions met	Verified and Acknowledged	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ yes ☑ no	☐ yes ☑ no ☐ Met after Allowance	Examiner's Signature Initials	IL	6	34	3

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ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND ,IN 46601

TITLE

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

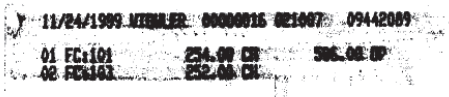
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BARNES & THORNBURG

600 1st Source Bank Center
100 North Michigan
South Bend, Indiana 46601-1632 U.S.A.
(219) 233-1171
Fax (219) 237-1125

http://www.btlaw.com

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BOX PATENT APPLICATION
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VIA EXPRESS MAIL
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Re: **U.S. Utility Patent Application**
For: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Our Reference: 20742/54088

Dear Sir:

Enclosed for filing are:

(1) Utility Patent Application Transmittal;

(2) Specification, including 34 claims (21 pages);

(3) 6 sheets of informal drawings;

(4) Unexecuted Declaration and Power of Attorney;

(5) Unexecuted Verified Statement (Declaration) Claiming Small Entity Status (37 C.F.R. 1.9(f) and 1.27(c)) - Small Business Concern;

(6) Patent Application Fee Determination Record;

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UTILITY PATENT APPLICATION TRANSMITTAL

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Attorney Docket No.	20742/54088
First Inventor or Application Identifier	Chia-Pei Chang
Title	Systems for Integrating Data Among Heterogeneous Systems
Express Mail Label No.	EL433668513US

JC675 U.S. PTO 09/442089 10/21/99

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231

1. [X] * Fee Transmittal Form *(e.g., PTO/SB/17)* (Submit an original and a duplicate for fee processing)
2. [X] Specification [Total Pages 21] (preferred arrangement set forth below)
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings (*if filed*)
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
3. [X] Drawing(s) *(35 U.S.C. 113)* [Total Sheets 6]
4. Oath or Declaration [Total Pages 2]
   a. [X] ~~Newly~~ executed (original or copy) Unexecuted
   b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d)) *(for continuation/divisional with Box 16 completed)*
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

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5. [ ] Microfiche Computer Program *(Appendix)*
6. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. [ ] Computer Readable Copy
   b. [ ] Paper Copy (identical to computer copy)
   c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [ ] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
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12. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
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17. CORRESPONDENCE ADDRESS

[ ] Customer Number or Bar Code Label (Insert Customer No. or Attach bar code label here) or [X] Correspondence address below

Name	Gerard T. Gallagher				
	Barnes & Thornburg				
Address	600 1st Source Bank Center				
	100 North Michigan Street				
City	South Bend	State	Indiana	Zip Code	46601
Country	St. Joseph	Telephone	219-233-1171	Fax	219-237-1125

Name (Print/Type)	Gerard T. Gallagher	Registration No. (Attorney/Agent)	39,679
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SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

Field of the Invention

The present invention relates generally to Enterprise Application Integration ("EAI") software, and more particularly to a configurable software system for providing migration of data among heterogeneous applications without requiring the development of code to accommodate the specific requirements of the heterogeneous applications present in a particular environment.

Background of the Invention

EAI software is generally designed to address the need of business to integrate various business software applications employed by the diverse operating sectors of a single business organization (for example, financial operations, human resources, shipping and receiving, etc.), or by such operating sectors of multiple organizations. Over time, many organizations incorporate disparate software applications, each designed to manage a specific business function or set of functions. Accordingly, data related to these business functions is dispersed across the organization, and resides separately within the various software applications.

Unfortunately, various software applications maintain data according to different data models, such as hierarchical networks, relational models, spreadsheets, multi-media databases, knowledge databases and other types of data models. Eventually, as more and more such applications are added to an organization, the need for data synchronization (or updating) and migration among applications grows. Thus, intelligent management, manipulation, and maintenance of organization-wide data requires an integration system capable of providing data transfer interfaces among the various heterogeneous applications employed throughout the organization (or across various organizations).

One product commonly found in modern business enterprises falls within the broad category of Enterprise Resource Planning ("ERP") software which generally provides

packaged suites of business applications. Examples of such ERP software include offerings by Oracle Corporation, SAP, PeopleSoft, and Baan. These ERP products may replace many individual business function applications with a single, integrated suite of applications, encompassing business operations including accounting, purchasing, shipping and receiving, human resources, etc. Notwithstanding a proliferation of such consolidated products, many organizations also maintain a variety of disparate applications as described above. Additionally, many organizations employ similar or identical ERP products at geographically diverse locations. Thus, integration among these heterogeneous applications and consolidated ERP products, as well as integration among ERP products, is desirable.

Various methods of meeting the above-described integration needs presently exist. One method is the development of custom integration software to interface, for example, an organization's specific set of heterogeneous applications with the applications within the organization's ERP product. The custom integration method employs a traditional software development model wherein custom code is written specifically to operate with a fixed group of heterogeneous applications and integrate them with an ERP product of a particular version. This method is time consuming, labor intensive and expensive to implement. Moreover, after the custom code is written, implemented, and tested, it provides the required integration only so long as the environment remains unchanged. When, for example, an updated version of the organization's ERP product is released, the custom integration software must be updated to correspond with the new version. This maintenance is also time-consuming and expensive. Additionally, because the timing of such maintenance depends entirely upon the new ERP product's release date, the associated costs are unpredictable and, therefore, difficult to budget.

Off-the-shelf, front-end integration packages, such as those provided by Cross Worlds or Constellar, are also available to address an organization's integration needs. This software is attached to the heterogeneous source applications and is used to query the source applications to obtain the desired data. Whole files are not transferred from a source application to a destination application for manipulation and use. More importantly, this front-end integration software does not directly integrate with the applications at the

destination end, but instead requires a software developer to generate custom code to bridge the gap between the front-end package and the destination applications. Accordingly, this software shares some of the costs and inflexibility disadvantages inherent in custom-built interfaces.

Other integration tools, such as products like Smart dB, include templates to connect destination applications with back-end servers and source applications. These templates reduce labor costs by reducing the complexity of the overall integration task. However, such template tools are also undesirable because developers must write custom code to bridge the gap between the source applications and the templates.

Summary of the Invention

The integration system of the present invention provides a flexible, end-to-end integration solution that manages all mapping, validation, and synchronization of data among heterogeneous source and destination applications within an organization and among the applications of multiple organizations. The system includes an active component (or engine) that performs the underlying communication and data processing functions, and a repository of information used by the active component relating to the characteristics of the source and destination applications. The functionality of the system is expandable through use of modules (or cartridges) that may be added to the repository as the organization's integration requirements expand. The modules are configurable, pre-built integration packages, which may be specific to a particular database application (for example, a particular application within an ERP product such as Oracle Applications). Once the repository is configured with information describing data contained within the organization's heterogeneous source applications, each module defines interface processes or instruction sets which migrate data between the source applications and a particular destination application. The active component is driven by instruction sets associated with the applicable module and other information in the repository to read and process inputs from a source application and perform the transfer of data to a destination application.

In addition to the modules, the repository includes configuration data relating to each installed module. Upon installation or expansion of a particular integration system according to the present invention, a user may activate a configuration interface provided with the system to configure the system to operate with the installed modules. During this process, configuration data is created and stored in the configuration data storage section of the repository within a portion of the configuration data storage corresponding to the applicable module. The active component uses the configuration data to determine which instruction sets (contained within the modules) to access. The modules assemble the instructions by accessing data elements (individual units of re-usable code) stored in a repository library. Since multiple modules may access the same data elements, updates to the library data elements are universally applicable to a variety of modules.

By providing a standard interface methodology that incorporates a collection of rules describing a particular destination application, the integration system of the present invention eliminates the need for custom software and the disadvantages of the development life cycle associated therewith, reduces user learning curves by virtue of the knowledge contained within the repository, eliminates manual data entry, and provides an upgrade path to future releases of the destination application, thereby reducing the cost of ownership. Updates may be accomplished by revising the repository and adding new modules, and distributing them as replacements to all organizations employing the revised destination application.

Additional features and advantages of the present invention will become more apparent to those skilled in the art upon consideration of the following detailed description of embodiments of the invention in conjunction with the accompanying drawings.

Brief Description of the Drawings

Figure 1 is a block diagram illustrating installation of the present integration system in an environment.

Figure 2 is a block diagram of the integration system of Figure 1.

Figure 3 is a block diagram illustrating an exemplary chain of data elements according to the present invention.

Figure 4 is another block diagram of a portion of the integration system shown in Figure 1.

Figure 5 is yet another block diagram similar to Figure 4.

Figure 6 is a block diagram illustrating the interaction between components of the integration system shown in Figure 1.

Description of Embodiments of the Invention

The embodiments described herein are not intended to be exhaustive or to limit the invention to the precise forms disclosed. Rather, the embodiments selected for description are described so that those skilled in the art may utilize their teachings.

Figure 1 is a block diagram illustrating an installation of an integration system 10 according to the present invention to provide for migration of data among a variety of heterogeneous applications (hereinafter collectively referred to as "source applications 12") and a variety of database applications (hereinafter collectively referred to as "destination applications 14"). In one embodiment of the invention, system 10 is a pre-built, open application programming interface ("API") which can operate as a conversion interface, providing one-time data transfer from source applications 12 to destination applications 14, and/or a standard interface providing periodic data exchange among applications. As indicated above, destination applications 14 may include suites of business applications provided by ERP products such as those produced by Oracle Corporation, SAP, PeopleSoft and Baan. The architecture of the present invention, however, and the concepts

and methodologies taught herein are equally applicable to any database application, including but not limited to those listed above. To simplify this description of the invention, destination applications 14 will be assumed to be Oracle Applications.

Source applications 12 may include any combination of legacy database applications 16, spreadsheet applications 18, web applications 20, applications containing text files 22, or even ERP applications 24. Destination applications 14 may include any combination of database applications 14A, 14B and ERP applications 14C. Because integration system 10 is configurable to correspond to source applications 12 and provides incremental functionality to accommodate use of future destination applications 14, the system offers a flexible solution for users who desire to maintain and use the data residing in their existing source applications.

Figure 2 depicts the basic components of integration system 10. System 10 generally includes an active component 30 (or engine) which provides generic interface functionality, and a knowledge repository 40. Repository 40 generally includes a library 50 having data elements 60 (as will be discussed in greater detail below), a plurality of plug-in modules 70 (i.e., software add-ons configured to operate with active component 30 to add increased functionality to system 10), which along with library 50, provide the business rules, instructions, and roadmaps to define interface processes and direct data migration, configuration data storage 80 containing configuration data which relates to the requirements of source 12 and destination 14 applications interfaced by a particular module 70 (i.e., "metadata" or data describing characteristics of other data), and temporary data storage 90 used by active component 30 for temporarily storing data during data processing. In one embodiment of the invention, configuration data of configuration data storage 80, data elements 60 of library 50, and temporary data of temporary data storage 90 are all stored as Oracle tables within a relational database represented by repository 40. Other formats for maintaining this information may be employed by one of ordinary skill in the art. Accordingly, this invention is not to be limited to the information storage format described herein.

Repository 40 essentially stores business logic that may relate to the entire suite of applications 14 available at the destination end of system 10. This business logic (or sets of rules) describes the structure and basic functionality of the destination applications 14, and includes a plurality of shareable components (data elements 60) which are used to migrate data to the destination applications 14. Modules 70 use data elements 60 to perform application-related operations.

Configuration data storage 80 may include information describing the source of the input data, the inputs to include with an interface, directions for processing and transforming data, extensions to a particular module 70, additional validation rules, data synchronization instructions, and workflow instructions as will be described in greater detail below. Configuration data storage 80 is created using a configuration interface 100 consisting of a series of interactive screens which permit the user to input the above-described information to set-up and install an interface between source 12 and destination 14 applications. Using configuration interface 100, source inputs (corresponding to data residing in source applications 12) are defined. The user may also select from the available inputs in source application 12 known by module 70 being installed.

Configuration interface 100 also permits the user to define the properties of temporary tables stored in temporary data storage 90 of repository 40 which are used by active component 30 as it processes data migrating between a source 12 and destination 14 application. These tables, in one embodiment, are physical tables given a user-defined name, having columns which include all relevant inputs from source application 12, all outputs to destination application 14, and all relevant inputs and outputs of data elements 60 used by modules 70. Each module 70 includes a list of predefined tables that are configured to work with the relevant destination application 14 that will receive the inputs. For example, a purchase order Oracle Application module 70 includes tables for headers, line items, shipment information, and so on. Configuration interface 100 displays screens listing the tables available for any particular module 70. The user may select some or all of the predefined tables to be populated with the input data. It should be understood, however, that by incorporating additional functionality in the library 50, modules 70, or active component

30, the "staging area" or "workspace" provided by temporary data storage 90 may be eliminated. Finally, the user may select a table in destination application 14 that will receive the data. Each predefined table associated with each module 70 includes a list of compatible Oracle tables that can accept the inputs of the temporary tables stored in temporary data storage 90.

Configuration interface 100 additionally permits the user to specify information about the files that will send the inputs to the predetermined tables of temporary data storage 90. By filling out information on the screens presented by configuration interface 100, the user may specify, for example, the length of fields located within a particular file of source application 12, the organization of the data and header information within the file, and how the datafields will be separated if they are not of fixed lengths. Since according to one embodiment of the invention, modules 70 are configured to correspond with Oracle destination applications 14, if source application 12 is an Oracle database, system 10 communicates with the source application directly using SQL*Net (an Oracle program that permits communication over a network between a client and database server). If source application 12 is not an Oracle database, system 10 communicates with source application 12 to transfer data into files which system 10 transfers to tables in temporary data storage 90, and then to destination application 14 as will be described in greater detail below. Of course, by incorporating modifications to active component 30 according to principles well known in the art, a variety of inputs may be acceptable to system 10, for example, inputs in XML or EDI format, or any other format.

The user may purchase system 10 including the components illustrated in Figure 2 with modules 70 corresponding to those required for interface with the user's presently-used destination applications 14. For example, if the user runs Oracle Applications, the user may select from a variety of available modules pre-built to permit interface with one of the plurality of business applications packaged within Oracle (i.e., vendors, employees, items, purchase orders, receipts, customers, bills of material, accounting, manufacturing, supply chain, projects, human resources and sales). The user may choose between providing information describing its present source applications 12 to

a developer or manufacturer of integration system 10 in order to facilitate pre-installation configuration of system 10 to operate with modules 70, or conducting on-site system configuration using configuration interface 100 as described above. As the user incorporates additional destination applications 14, additional modules 70 may be purchased and configured to provide interfaces among source applications 12 and newly incorporated destination applications 14. Consequently, integration system 10 according to the present invention requires no generation of custom software at the initial installation stage or at the upgrade stage, but instead uses a pre-packaged active component 30 with off-the-shelf modules 70 and is configurable to operate with the modules using the configuration interface 100 set-up process described herein.

Once interfaces are configured using the above-described process, the user may set up a destination application 14 to, for example, invoke integration system 10 on a periodic basis to insure that the data residing in destination application 14 is consistent with the data in source applications 12. For example, if inventory information is maintained on a spreadsheet source application 12 and modified as the inventory status changes throughout the day, and the inventory destination application 14 provided by Oracle is invoked to produce an inventory report on the following day (or after hours at the end of a particular day), the Oracle Inventory Application 14 may be configured to invoke integration system 10, thereby initiating data migration from spreadsheet application 12 to Oracle Inventory Application 14. As should be apparent from the foregoing, such data migration may occur periodically according to a predetermined schedule as described above, or be event-driven (for example, initiated by receipt of input data) or initiated manually, upon command of the user.

Referring now to Figures 3 and 5, each data element 60 within library 50 includes a combination of related inputs 62, related outputs 64, rules for translation and mapping (mapping rules 66), and rules for data validation (validation rules 68). These data elements 60 essentially consist of reusable code or units of work that perform a discrete data manipulation function, and may be shared among interfaces defined by modules 70. The

data elements 60 are accessed and assembled into combinations of data elements (data element chains 110) when module 70 executes a function.

Figures 4 through 6 illustrate the interaction between integration system modules 70, configuration data storage 80, and data element library 50. As indicated above, each module 70 is an add-on software cartridge which corresponds to a destination application 14. As indicated in Figures 4 and 5, each module 70A, 70B communicates with a portion of configuration data 80A, 80B, respectively, contained within configuration data storage 80 of repository 40, and repository library 50, containing a plurality of individual data elements 60. When active component translator 120 or validator 150 requests instructions from a particular module 70A for processing data in an interface table in temporary data storage 90, that portion of the active component 30 provides an input 62 to module 70A which module 70A interprets as a request for instructions to control that portion's process in achieving an output. Module 70A provides an instruction set for achieving the output which then calls upon a series of data elements 60 within library 50 to perform individual tasks that may be common to a variety of modules 70. Essentially, each module 70 includes a plurality of linked pointers to particular data elements 60 which together process input 62 to achieve desired output 64. Information regarding the data from source application 12 necessary to carry out this processing resides in configuration data portion 80A corresponding to the particular module, and is accessed by module 70A during this processing.

As depicted in Figure 3, each data element 60 of a data element chain 110 (resulting from a chaining process carried out by cartridge 70) may include a plurality of related inputs 62, a corresponding plurality of related outputs 64, and mapping rules 66 and validation rules 68 typically applied to inputs 62 to generate outputs 64 which are validated within the data element. Outputs 64 of each data element 60 can populate a target column within a destination application 14, such as output 64A of data element 60A, operate as an input 62 for other data elements 60, such as outputs 64B, 64B', 64C, 64D of data elements, 60B, 60C, 60D, or determine the context in which other data elements 60 are to be used.

With an understanding of the characteristics of the data used by a particular destination application 14, chains 110 of data elements 70 may be constructed such that a variety of disparate inputs 62 to data element chain 110 can be processed to produce an appropriate output 64. In the example illustrated in Figure 3, input 62 to data element 60 is mapped and validated as an output 64′ which data element 60B receives as input 62B. The mapping and validation rules 66B, 68B incorporated in data element 60B produces two outputs 64B, 64B′ which are used as inputs 62C, 62D to data elements 60C and 60D, respectively. Each of data elements 60C, 60D produces a single output 64C, 64D, respectively, which is combined with the output of the other as inputs 62A, 62A′ to data element 60A. Data element 60A maps and validates inputs 62A, 62A′ to produce a single output 64A which will ultimately be used to populate a data table within destination application 14.

Figure 4 illustrates multiple data element chains 110 (representing multiple module instruction sets) contained within a single module 70A, each accessing a plurality of data elements 60, many of which may be common to each data element chain 110, for producing a desired output 64. Each module 70A may execute a variety of chaining processes, creating complex,"virtual" data elements by connecting the input 62 and output 64 of several simple data elements 60 to provide a series of possible interface functions that may be requested of module 70A depending on the destination application 14 to which module 70A relates. As should be apparent from the foregoing, modules 70 do not actually contain data elements 60, but rather contain information describing where they may be found in library 50.

For example, an input from a source application 12 may correspond to the name of a particular contact individual within an organization. After configuration data storage 80 of repository 40 has been configured to recognize the contact name data from source application 14, and the contact name data has been loaded into an interface table within temporary data storage 90 of repository 40, data element chain 110 may be called upon by active component 30 to provide appropriate profile information related to the contact (or the contact's organization) acceptable for population in a table within destination

application 14. Data element 60 of data element chain 110 may receive the data as input 62 through translator 130 (as described in greater detail below) and, by consulting configuration data portion 80A associated with the particular module 70A, may recognize that the contact name data within source application 12 includes the first, middle, and last name of the contact all within one field. Because module 70A may be configured to operate with a particular destination application 14, appropriate data elements 60 will be chained to convert source application 12 contact name data into a format acceptable to destination application 14. This format may include a contact number which corresponds to the contact's last name. Accordingly, input 62 to data element 60 may be mapped by mapping rules 66 to provide an output 64′ which consists of the contact's last name. Output 64′ is provided as an input 62B to data element 60B. Mapping rules 66B within data element 60B convert the data representing the contact's last name into a number used to identify the contact in various tables throughout destination application 14. This contact number is provided as output 64B. Additionally, input 62B produces an output 64B′ which corresponds to an organization number representing the organization to which the contact individual belongs. Output 64B is provided as input 62C to data element 60C. Similarly, output 64B′ is provided as input 62D to data element 60D. Data element 60C accesses contact profile information located in a table of destination application 14 corresponding to the contact name present as input 62C. Output 64D of data element 60D corresponds to profile information associated with the organization number present at input 62D. Outputs 64C, 64D are provided as inputs 62A, 62A′ of data element 60A. Mapping rules 66A of data elements 60A provide for one-to-one mapping of input 62A or input 62A′. Validation rules 60A associated with data element 60A access yet another Oracle table in destination application 14 to determine whether, given the context of the present operation, the contact profile information is valid. Data elements 60A may include instructions, for example, which require that in the context of the present transaction, the presence of both contact number input 62A and organization number input 62A′ require an output of the organization number at output 64A.

Additional data elements 60 in other chains 110 may be called upon by module 70A to reconcile differences in the input data, such that the output is usable by destination application 14. For example, data element 60 may be invoked which maps an input 62 of an organization name including "Inc." to an output 64 of the organization name without "Inc." Since the units of work represented by each data element 60 may be applicable to a variety of chains 110 within various modules 70 (i.e, the first step in a variety of operations may be to strip the "Inc." from an input organization name), data elements 60 within library 50 may be used by a variety of modules 70 depending upon the configuration of the instruction sets or chains 110 within the module. Accordingly, modifications relating to a variety of destination applications 14 may be accommodated by relatively few changes to the appropriate data elements 60 within library 50 that will be called upon by the plurality of modules 70 directing interface to the destination applications 14.

In operation, when destination application 14 requests data held in a file or database residing in source application 12, for example, an appropriate module 70 corresponding to the particular destination application 14 responds to the data request from the destination application 14 by instructing active component 30 to obtain or receive data from source application 12. Module 70 assembles these instructions in response to the input data request by compiling various data elements 60 within repository library 50 (Figures 4 and 5) according to the predetermined instruction sets designed into the module. Modules 70 then instruct active component 30 to process the data, as described in greater detail below, such that it is transferable and useable by destination application 14.

The standard methodology for accomplishing data migration from source application 12 to destination application 14 is illustrated schematically in Figure 6. As shown in Figure 6, integration system active component 30 includes a loader 120, a translator 130, a synchronizer 140, a validator 150, and an interfacer 160. Upon receipt of appropriate command sets corresponding to, for example, a request for data stored in source application 12, loader 120 communicates with configuration data storage 80 of repository 40 to determine the characteristics of the source data and the specific manner in which the data should be loaded into temporary data storage 90 in the repository. Loader 120 then

reads or receives the data from source application 12, and populates the appropriate table in temporary data storage 90.

Next translator 130 communicates with the appropriate module 70 corresponding to destination application 14 to obtain instructions for translating the source data into destination data for updating tables within temporary data storage 90. During this process, integration system 10 performs a net change function wherein synchronizer 140 accepts as inputs all data loaded by loader 120, but compares these data inputs to data residing in destination application 14 and returns only those data inputs that have been updated, deleted, or are new relative to the previous execution of the same data migration process. This net change function insures that all data modifications in source application 12 are correctly represented in destination application 14 at the end of each run . Of course, integration system 10 may be configured to accept as inputs only inserted, updated, or deleted data from source application 12 relative to destination application 14. Under this configuration, source application 12 is utilized to determine the differences between the data as it exists during the present run and as it existed during the prior run of integration system 10.

Validator 150 of active component 30 next communicates with the appropriate module 70 in repository 40 to determine whether the data residing in the active interface table of temporary data storage 90 has been properly translated and processed, such that its content is consistent with the configuration parameters residing in configuration data storage 80 associated with module 70, and its format is appropriate for populating destination application 14. Upon detecting errors, validator 150 marks records as being invalid and generates a report for transmission to destination application 14. After the data from source application 12 has been loaded, translated, synchronized, and validated, interfacer 160 moves the data from the interface table of temporary data storage 90 into an appropriate table residing in destination application 14.

While this application has been described as having exemplary embodiments, this application is intended to cover any variations, uses, or adaptations using its general principles. Further, this application is intended to cover such departures from the present

disclosure as come within the known or customary practice within the art to which it pertains. The spirit and scope of the invention are to be limited only by the terms of the appended claims.

WHAT IS CLAIMED IS:

1. A system for integrating data among heterogeneous source applications and destination applications, comprising:

a repository of information relating to the source applications and the destination applications, the repository including a plurality of data elements each being capable of performing a discrete operation on a piece of data, and a first module including a plurality of instruction sets, each instruction of each instruction set activating a data element; and

an active component connected to the repository having an input for loading data from the source applications, and an output for populating the destination applications with processed data, the active component processing the data from the source applications by activating data elements according to the plurality of instruction sets in the module.

2. The system of claim 1 wherein the plurality of instruction sets are predefined to facilitate interface with a particular destination application.

3. The system of claim 1 further comprising a second module including a plurality of instruction sets, each instruction of each instruction set activating a data element, the first module plurality of instruction sets being defined for interface with a first group of destination applications, the second module plurality of instruction sets being defined for interface with a second group of destination applications.

4. The system of claim 3 wherein at least one data element of the plurality of data elements is activated by both the first module plurality of instruction sets and the second module plurality of instruction sets.

5. The system of claim 3 wherein the repository further includes configuration data storage for storing configuration data describing data in the source applications, the configuration data storage including a first portion used by the first module and a second portion used by the second module.

6. The system of claim 1 wherein the temporary data and the data elements are stored in a relational database.

7. The system of claim 1 wherein the repository is capable of receiving a plurality of modules.

8. The system of claim 1 wherein the destination applications are included within an ERP product.

9. The system of claim 1 wherein the active component is capable of loading entire files from a source application.

10. The system of claim 1 wherein the repository further includes a library for storing the plurality of data elements.

11. The system of claim 1 wherein the repository further includes temporary data storage for storing data temporarily as the data is being processed for introduction into a destination application.

12. The system of claim 11 wherein the first module includes a plurality of predefined tables which are selectably installed in the temporary data storage to receive temporary data, each of the predefined tables being configured for compatibility with a destination application.

13. The system of claim 12 wherein each predefined table includes a plurality of selectable destination tables residing within the destination applications which are compatible with the predefined table.

18 ~~14~~. The system of claim 1 wherein the active component may be activated by the destination application to integrate data periodically according to a predetermined schedule.

19 ~~15~~. The system of claim 1 wherein each of the plurality of data elements includes related inputs, related outputs, mapping rules, and validation rules.

20 ~~16~~. The system of claim 19 wherein each of the data element outputs may populate a destination application, provide an input to another data element, or indicate the context of another data element's operation.

14 ~~17~~. The system of claim 11 wherein the repository further includes configuration data storage for storing configuration data describing data in the source applications and data in the temporary data storage, the active component loading data from the source applications into the temporary data storage according to the configuration data.

18. The system of claim 17 further comprising a configuration interface for generating the configuration data, the configuration interface providing a series of screens to assist the user in describing the source applications.

19. The system of claim 17 wherein the active component input is a loader which reads data in a source application and populates the temporary data storage with the source application data according to the configuration data.

20. The system of claim 17 wherein the active component further includes a validator which communicates with the module to verify that the data residing in the temporary data storage is consistent with the configuration data associated with the module and properly formatted for populating the destination application.

21. The system of claim 1 wherein the active component further includes a translator which communicates with the module to translate data from the source application into data acceptable to the destination application according to the plurality of instruction sets in the module.

22. The system of claim 1 wherein the active component further includes a synchronizer which compares the data loaded from the source application into the temporary storage to data residing in the destination application and returns to the temporary data storage only data which differs from the data residing in the destination application.

23. A system for integrating data among heterogeneous source applications and destination applications, comprising:

configuration data storage for storing configuration data relating to the source applications;

temporary data storage for storing temporary data being integrated among the source and the destination applications;

a library of data elements, each data element performing a predefined function;

a first module including a plurality of instruction sets, each instruction set specifying a plurality of data elements to form a chain of data elements; and

an active component operably associated with the configuration data storage, the temporary data storage, the library, and the first module, the active component including a

loader for loading data from the source applications to the temporary data storage according to the configuration data relating to the source applications, and an interfacer for populating the destination applications with data from the temporary data storage after the data is processed by the active component, the active component processing the data by communicating with the first module and activating data element chains according to instruction sets of the first module.

24. The system of claim 23 wherein the plurality of instruction sets of the first module are configured to operate with a particular destination application.

25. The system of claim 23 further comprising a second module including a plurality of instruction sets specifying chains of data elements, at least one of the data elements specified by the instruction sets of the first module also being specified by the instruction sets of the second module.

26. The system of claim 23 wherein the configuration data, the temporary data, and the data elements are stored in a relational database.

27. The system of claim 23 wherein the first module includes a plurality of predefined tables which are selectably installed in the temporary data storage, each predefined table being capable of receiving data from a source application.

28. The system of claim 27 wherein each predefined table is configured for compatibility with a destination application.

29. The system of claim 23 wherein each of the data elements includes inputs, outputs, mapping rules, and validation rules.

30. The system of claim 23 further comprising a configuration interface including a series of screens for permitting the user to describe the source applications, the configuration interface generating configuration data relating to the source applications.

31. The system of claim 23 wherein the active component further includes a validator which communicates with the first module to verify the content and format of the temporary data against the configuration data.

32. The system of claim 23 wherein the active component further includes a translator which communicates with the first module to translate data from the source applications according to the data element chains.

33. The system of claim 23 wherein the active component further includes a synchronizer which carries out a net change function wherein the synchronizer compares data in the destination applications to the temporary data and updates the temporary data such that the temporary data reflects the differences between the temporary data and the data in the destination applications.

34. A data integration system for providing end-to-end integration between a plurality of source applications and a destination application, the system comprising:

repository means for containing information relating to the source applications and the destination application, the repository means including temporary storage means for storing temporary data from the source applications, configuration storage means for storing configuration data describing data in the source applications and in the temporary storage means, library means for storing a plurality of data element means for performing data interface functions, each of the data element means being capable of performing a single data interface function, and module means for providing instructions for executing predefined series of data element means; and

active component means for moving data from the source applications to the temporary storage means, processing the data according to the module means instructions, and populating the destination application with resulting data residing in the temporary storage means.

ABSTRACT

A system for integrating data among heterogeneous source applications and destination applications including a knowledge repository containing temporary data storage for storing data from the source applications during processing for population in the destination applications, a library of data elements each providing a discrete data manipulation function, configuration data storage for storing user-provided information describing the integration environment, and a plurality of add-on modules or cartridges which each include a plurality of predefined instruction sets defining chains of data elements to perform interface functions corresponding to a particular destination application. The underlying interface communication and processing functions are performed by an active component (or engine) according to the configuration data and the module instruction sets. The active component is driven by the repository data to load source data into the temporary data storage, translate, synchronize, and validate that data, then interface the data to a destination application. A configuration interface permits the user to configure the system.

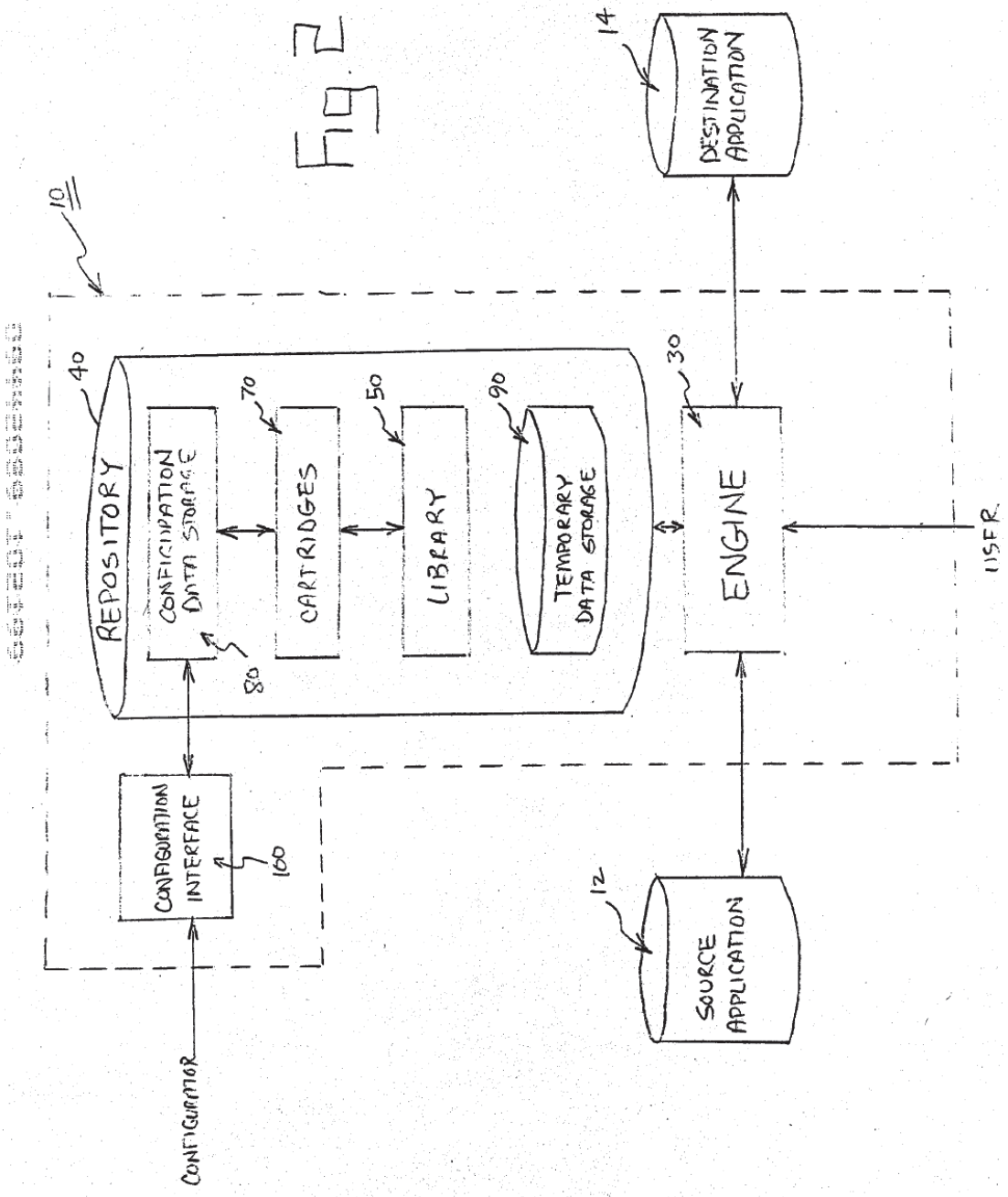
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Fig. 1

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Fig. 2



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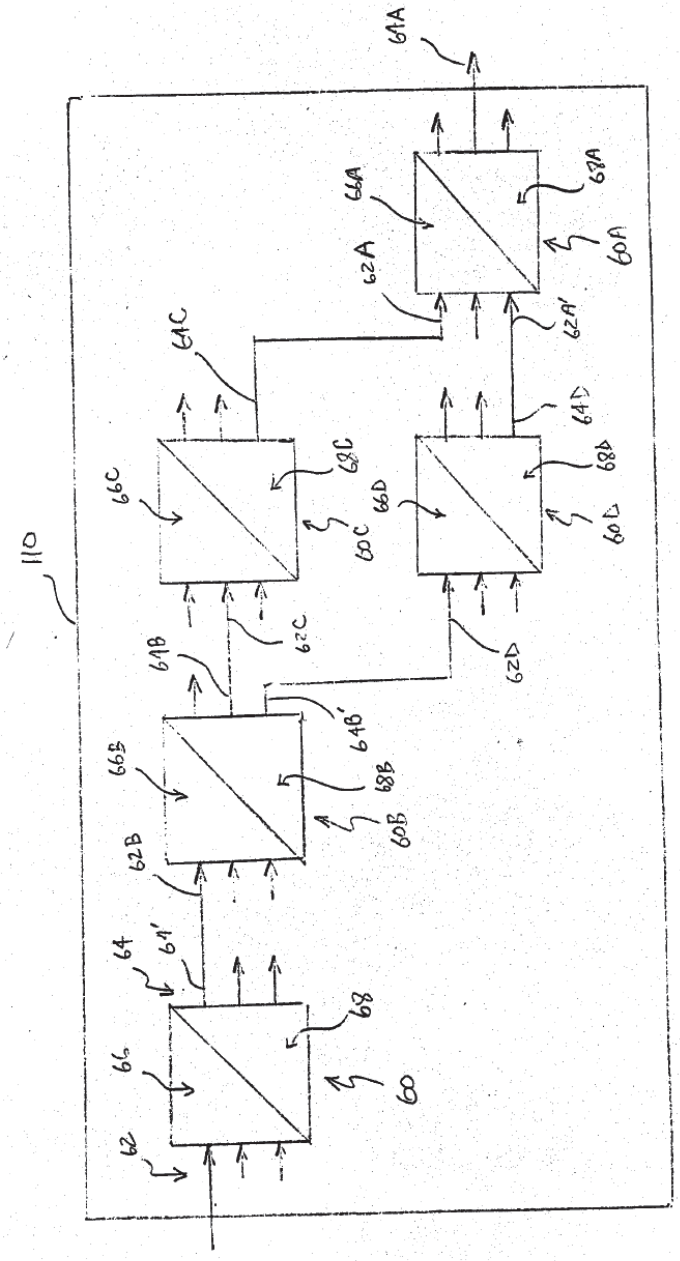
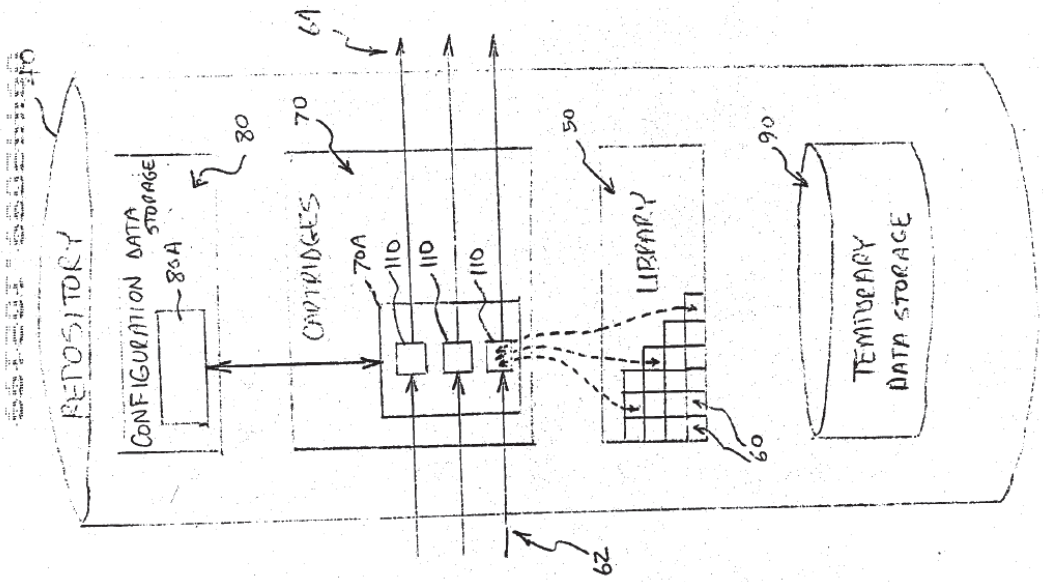


FIG. 3

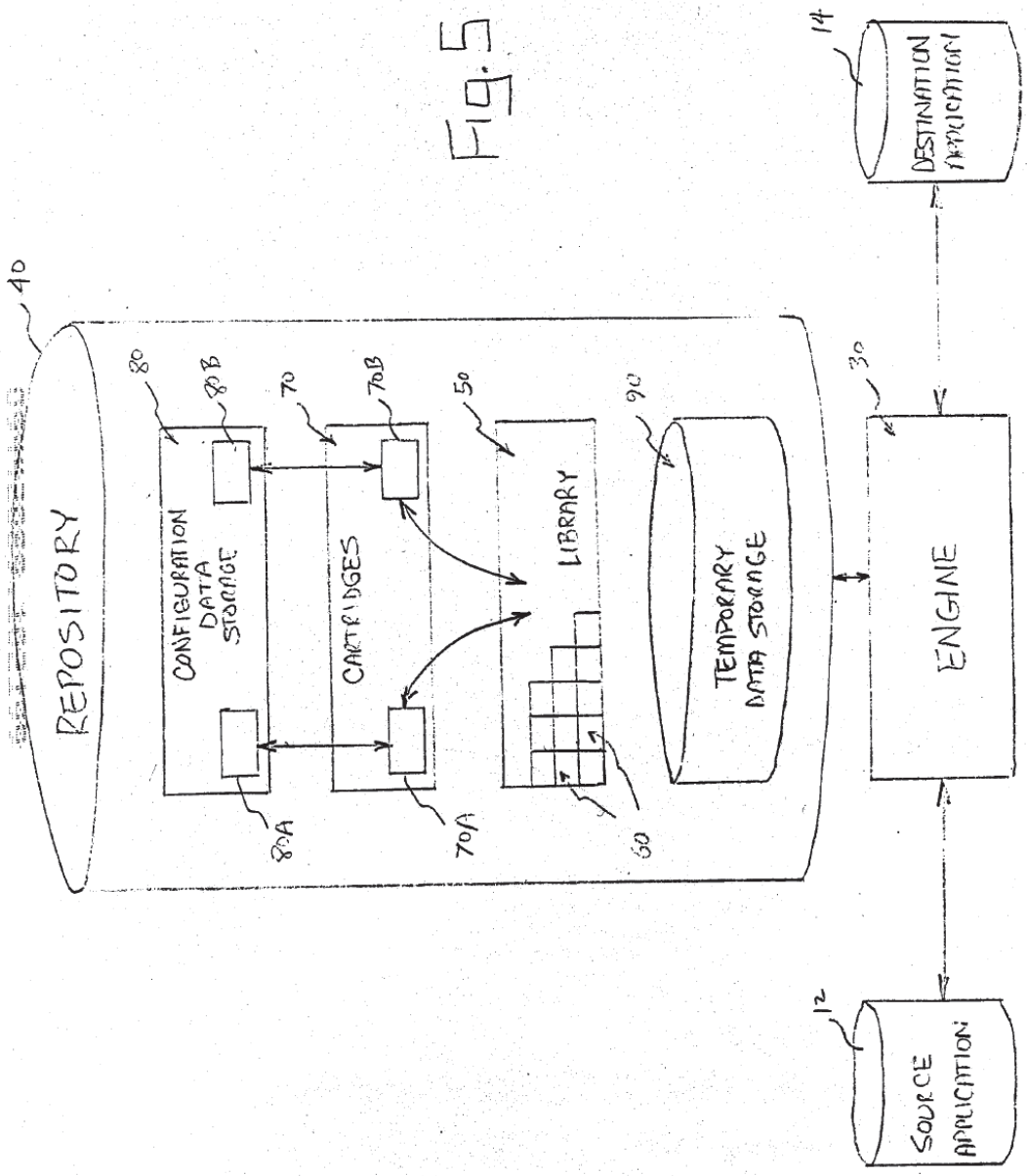
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FIG. 4



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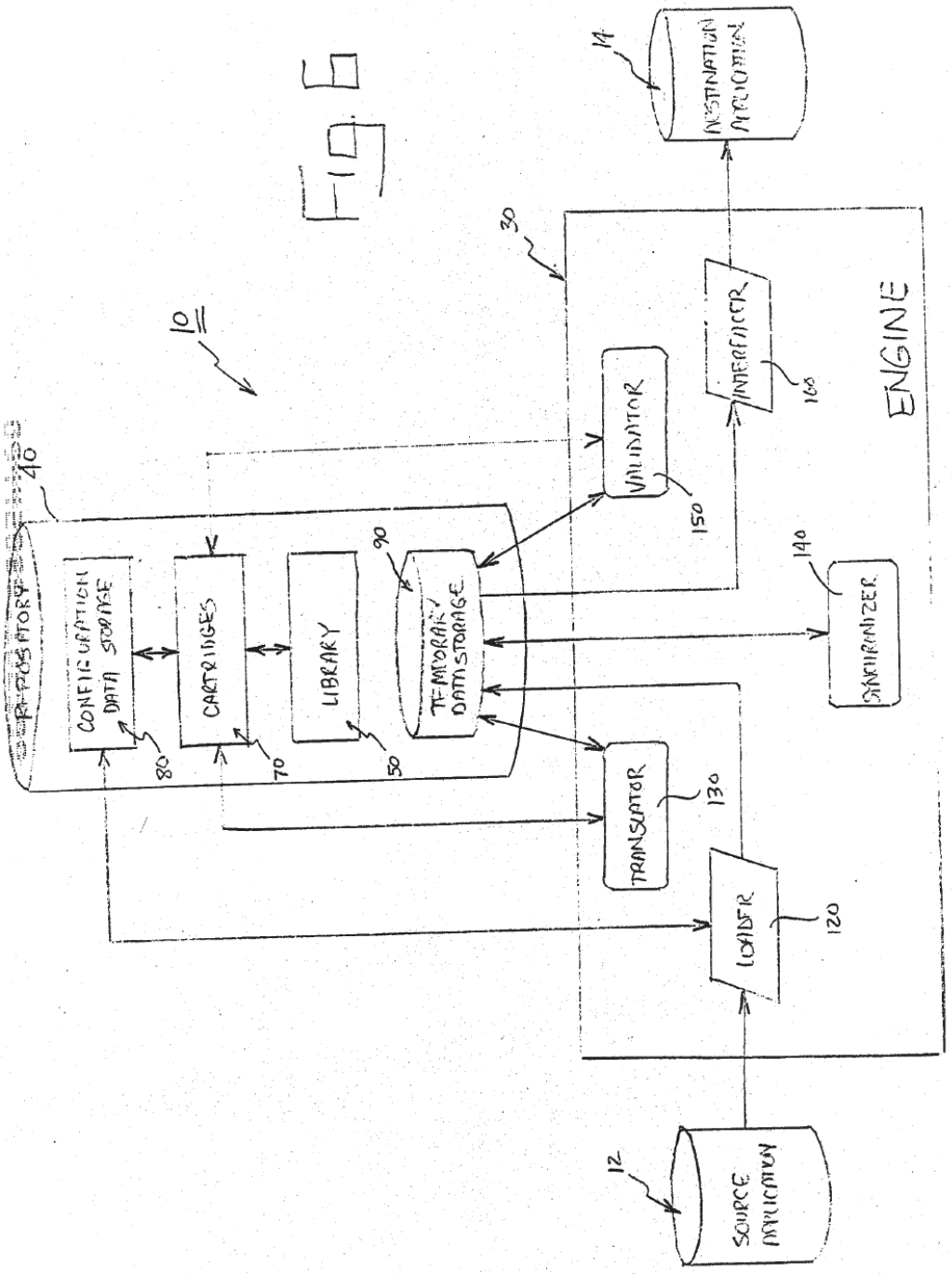
Fig. 5



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FIG. 6



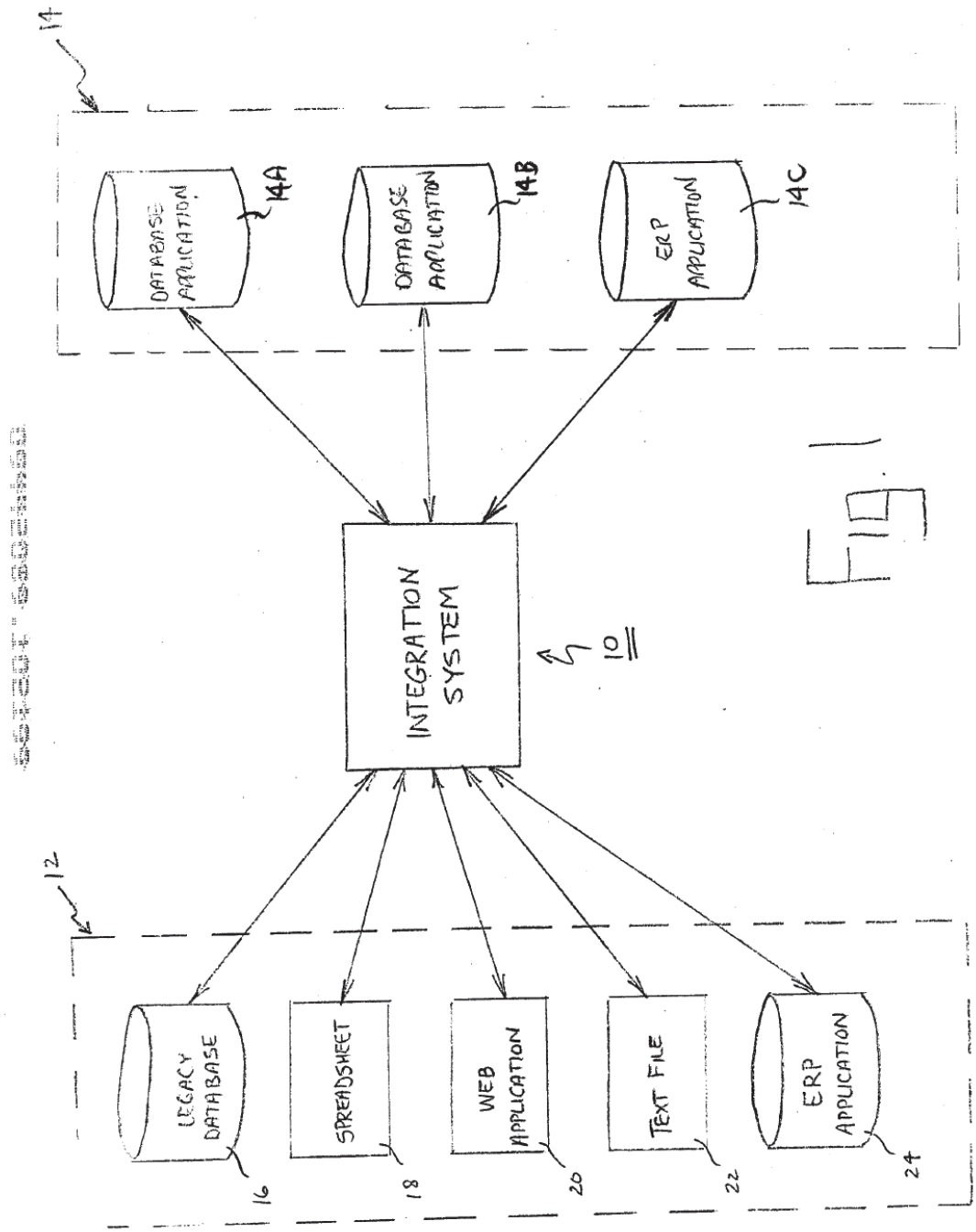

14
DATABASE APPLICATION
14A
DATABASE APPLICATION
14B
ERP APPLICATION
14C
INTEGRATION SYSTEM
10
12
LEGACY DATABASE
16
SPREADSHEET
18
WEB APPLICATION
20
TEXT FILE
22
ERP APPLICATION
24

Fig 1

6 Figs

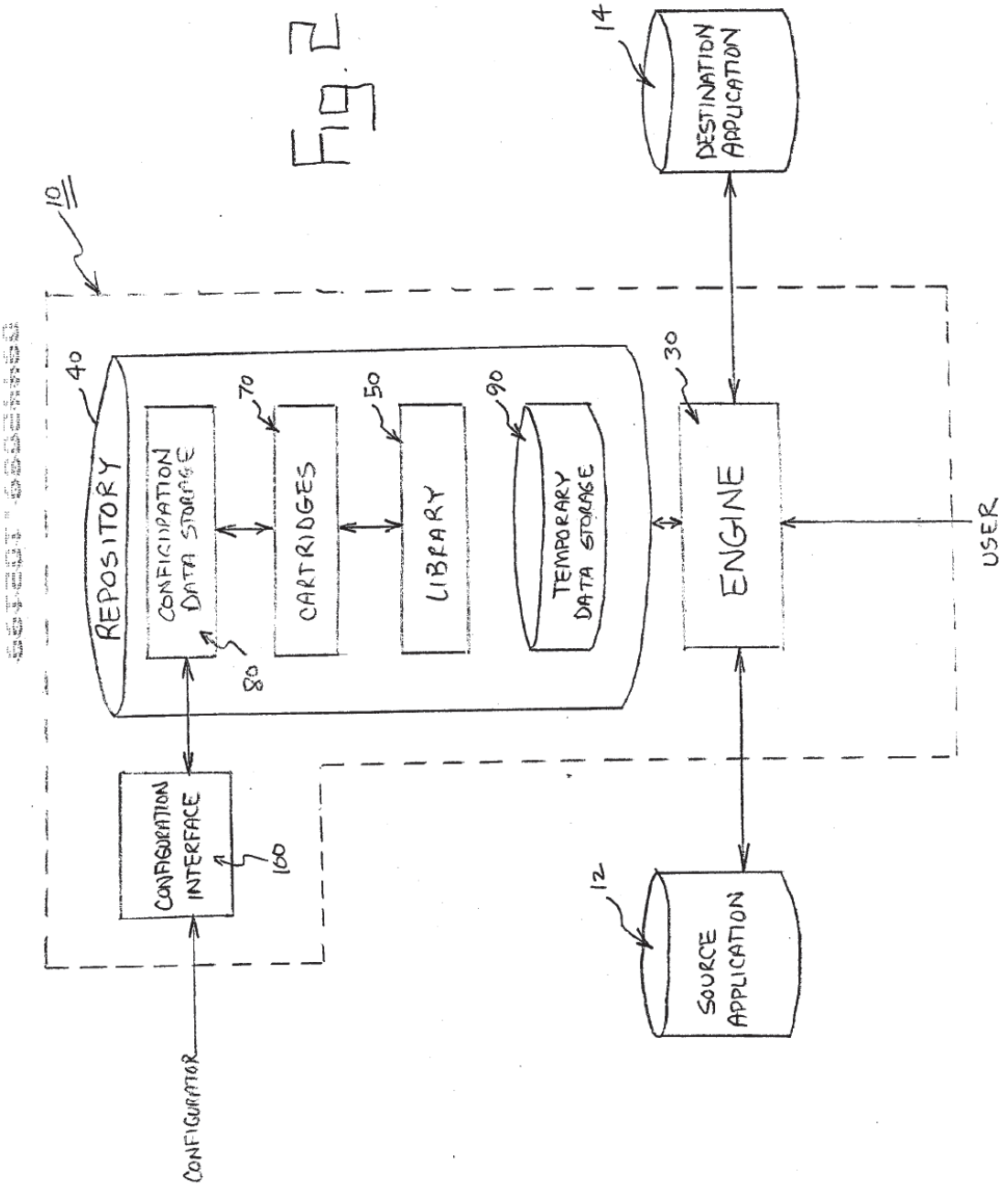

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REPOSITORY
CONFIGURATION DATA STORAGE
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CARTRIDGES
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LIBRARY
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TEMPORARY DATA STORAGE
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ENGINE
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DESTINATION APPLICATION
12
SOURCE APPLICATION
USER
CONFIGURATION INTERFACE
160
CONFIGURATOR

Fig. 2

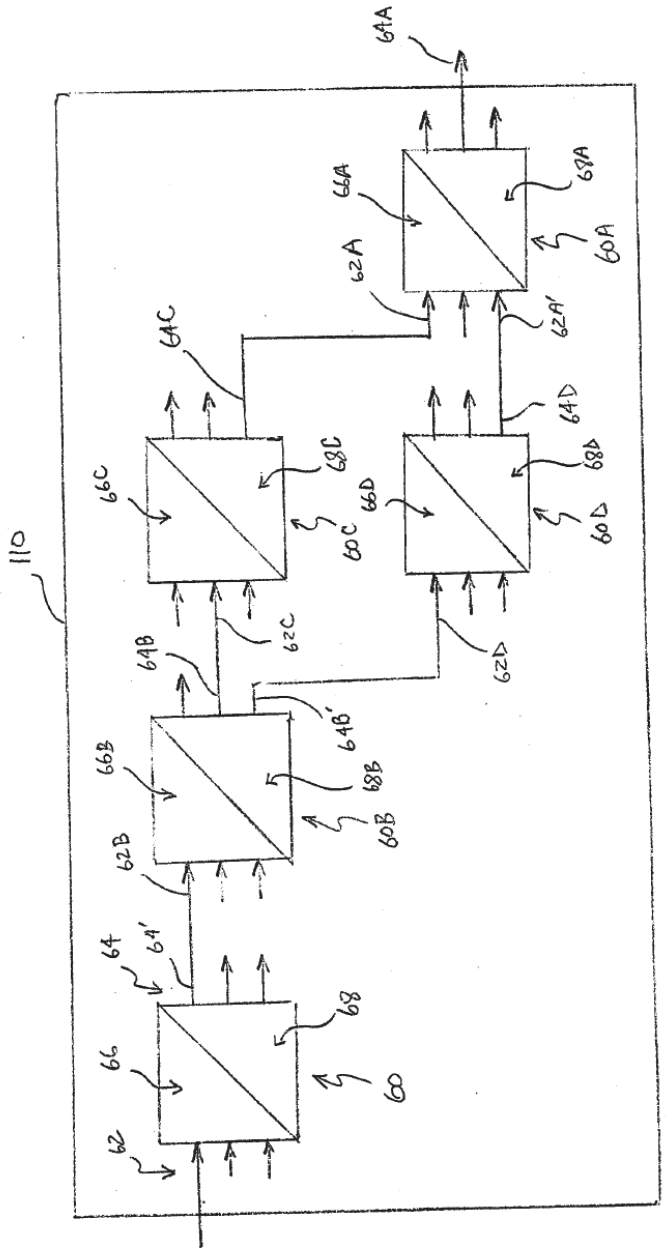

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Fig. 3

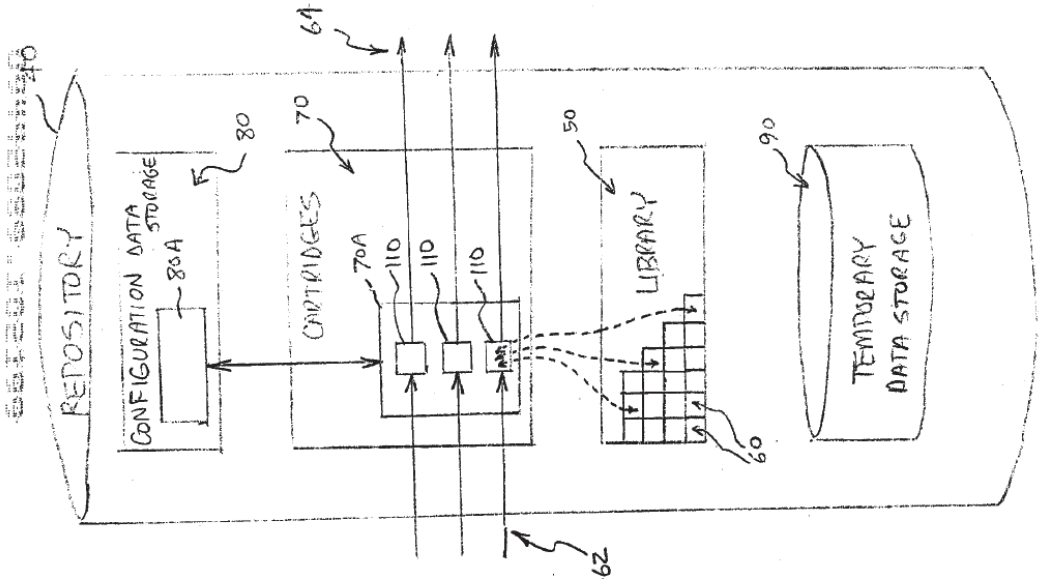

REPOSITORY
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CONFIGURATION DATA STORAGE
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CARTRIDGES
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TEMPORARY DATA STORAGE
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FIG. 4

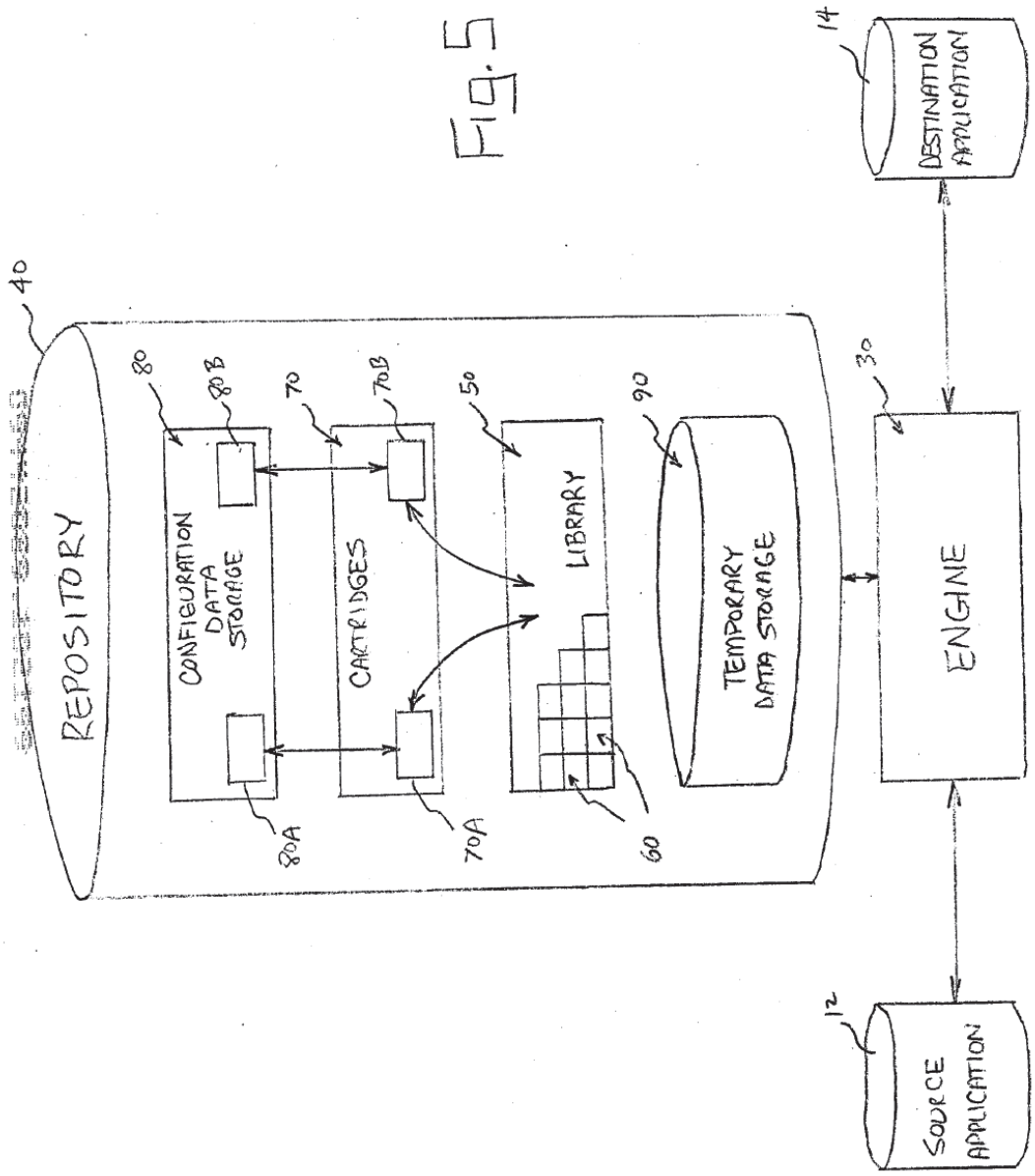
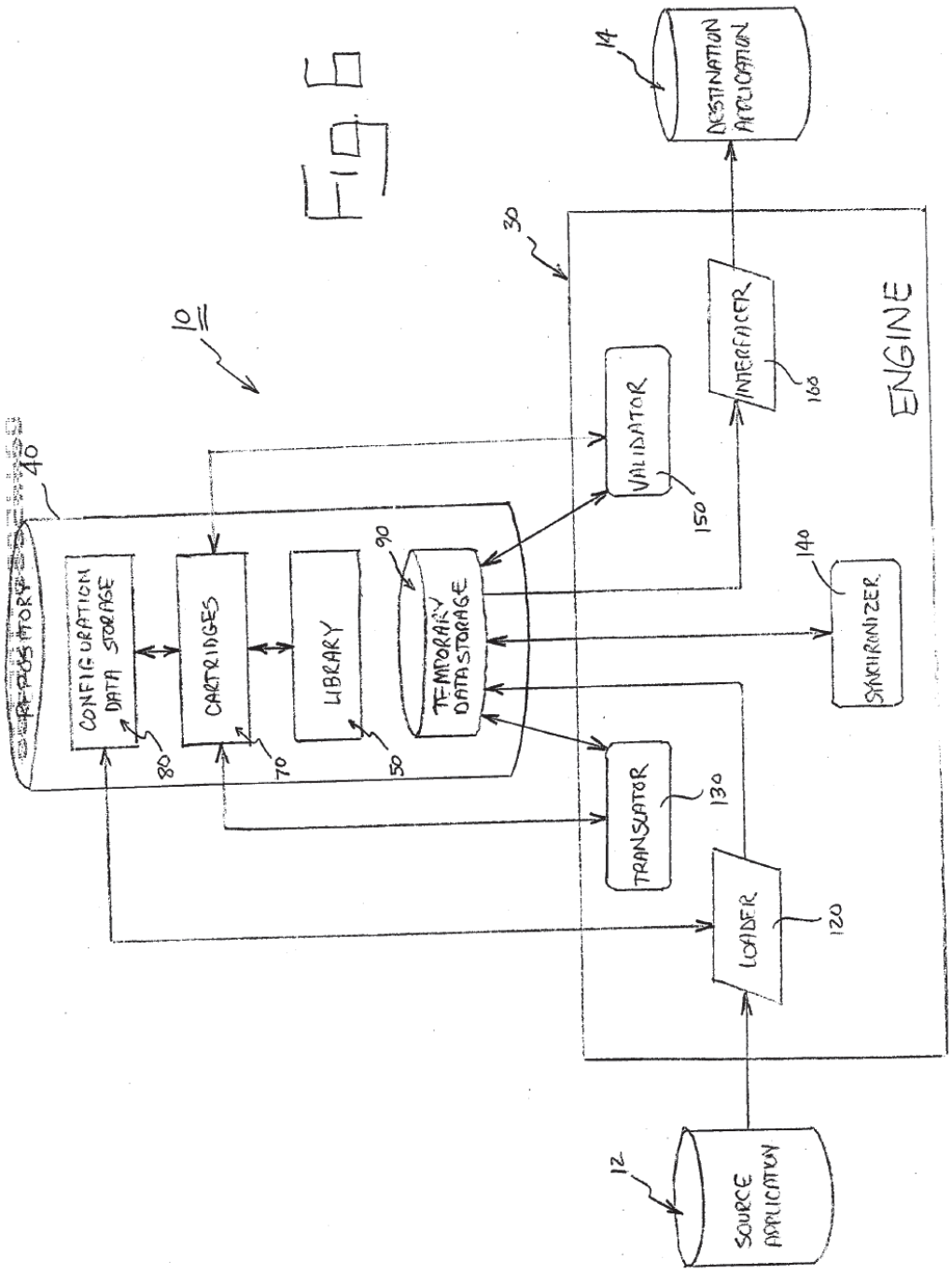

REPOSITORY
CONFIGURATION DATA STORAGE
CARTRIDGES
LIBRARY
TEMPORARY DATA STORAGE
ENGINE
SOURCE APPLICATION
DESTINATION APPLICATION
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Fig. 5


FIG. 6
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CONFIGURATION DATA STORAGE
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CARTRIDGES
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LIBRARY
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TEMPORARY DATA STORAGE
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30
ENGINE
VALIDATOR
150
INTEGRATOR
160
SYNCHRONIZER
140
TRANSLATOR
130
LOADER
120
12
SOURCE APPLICATION
14
DESTINATION APPLICATION

..ttorney Docket No.: 20742/54088
PATENT

DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare: that my citizenship, residence and post office address are as stated below; that I verily believe I am the original, first and sole inventor (if only one is named below) or a joint inventor (if plural inventors are named below) of the invention entitled: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS,

the specification of which

(check one) __X__ is attached hereto

____ was filed on _____ as Application Serial No. _____
and was amended on _____.
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority	Claimed
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby appoint as principal attorneys: _____ Jerry E. Hyland, Reg. No. 20,904; William R. Coffey, Reg. No. 24,023; Perry Palan, Reg. No. 26,213; Paul B. Hunt, Reg. No. 37,154; Gerard T. Gallagher, Reg. No. 39,679; Robert D. Null, Reg. No. 40,746; Richard D. Conard, Reg. No. 27,321; Steven R. Lammert, Reg. No. 27,653; Richard A. Rezek, Reg. No. 30,796; Timothy E. Niednagel, Reg. No. 33,266; Bobby Brian Gillenwater, Reg. No. 31,105; Michael S. Gzybowski, Reg. No. 32,816; and Mark M. Newman, Reg. No. 31,472; to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to the following address:

Robert D. Null
Barnes & Thornburg
600 1st Source Bank Center
100 North Michigan Street
South Bend, Indiana 46601
(219) 233-1171

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

(Full Name) (Signature)

Date _____ Inventor Chia-Pei Chang _____
Residence 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657 Citizenship USA
Post Office Address 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657

Date _____ Inventor Brian J. Connolly _____
Residence 1539 Della Drive, Hoffman Estates, Illinois 60195 Citizenship USA
Post Office Address 1539 Della Drive, Hoffman Estates, Illinois 60195

Date _____ Inventor Eric [illegible]ckledge _____

Residence 14415 Westwood Trail, Woodstock, Illinois 60098 Citizenship USA

Post Office Address 14415 Westwood Trail, Woodstock, Illinois 60098

Date _____ Inventor Robert John Hoffman _____

Residence 120 LeMans Drive, Wheeling, Illinois 60090 Citizenship USA

Post Office Address 120 LeMans Drive, Wheeling, Illinois 60090

Date _____ Inventor Bob Homan _____

Residence 7081 W. Touhy Avenue, #305, Niles, Illinois 60714 Citizenship USA

Post Office Address 7081 W. Touhy Avenue, #305, Niles, Illinois 60714

Date _____ Inventor Klaus Schulz _____

Residence 4725 Woodward Avenue, Downers Grove, Illinois 60515 Citizenship USA

Post Office Address 4725 Woodward Avenue, Downers Grove, Illinois 60515

EXPRESS MAIL NO. EV 339 909 525 US

Atty Docket No.: 20742/54088
PATENT

Applicant(s) or Patentee: Chia-Pei Chang, Brian J. Connolly, Eric Blackledge, Robert John Hoffman, Bob Homan and Klaus Schulz

Serial [ ] Patent [ ] No.:
Filed [ ] Issued [ ]

For: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 C.F.R. 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

[ ] the owner of the small business concern identified below:
[X] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Darc Development Partners, Inc.

ADDRESS OF CONCERN 125 South Wacker Drive, #2550, Chicago, Illinois 60606

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 C.F.R. § 121.3-18, and reproduced in 37 C.F.R. § 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
by inventor(s) Chia-Pei Chang, Brian J. Connolly, Erick Blackledge, Robert John Hoffman, Bob Homan and Klaus Schulz
described in

[X] the specification filed herewith
[ ] application serial no. _____, filed _____
[ ] patent no. _____, issued _____.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 C.F.R. § 1.9(d) or by any concern which would not qualify as a small business concern under 37 C.F.R. § 1.9(d) or a nonprofit organization under 37 C.F.R. § 1.9(e).
*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 C.F.R. § 1.27)

NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGAN.

NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGAN.

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. § 1.28(b)).

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Brian J. Connolly

TITLE OF PERSON OTHER THAN OWNER _____

ADDRESS OF PERSON SIGNING _____

SIGNATURE _____ DATE _____

SBDS02 RDN 187902

Attorney Docket No. 20742/54088
PATENT

CERTIFICATE OF MAILING

The undersigned, Linda E. Spore, certifies that the following have been served upon the Assistant Commissioner of Patents by depositing same in the United States mail, via Express Mail No. EL433668513US this 21st day of October, 1999:

(1) Utility Patent Application Transmittal;

(2) Specification, including 34 claims (21 pages);

(3) 6 sheets of informal drawings;

(4) Unexecuted Declaration and Power of Attorney;

(5). Unexecuted Verified Statement (Declaration) Claiming Small Entity Status (37 C.F.R. 1.9(f) and 1.27(c)) - Small Business Concern;

(6) Patent Application Fee Determination Record;

(7) Check in the amount of $506.00 for the appropriate filing fees;

(8) Certificate of Mailing via Express Mail No. EL433668513US; and

(9) Filing Receipt Card.

Linda E. Spore

Linda E. Spore

SBDS02 GTG 187883

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
09/442,089	10/21/99	CHANG C	20742/54088

0222/1208

ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

NOT ASSIGNED

2771

DATE MAILED: 12/08/99

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). **If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of ☐ $65.00 for a small entity in compliance with 37 CFR 1.27, or ☒ $130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.**

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☐ small entity (statement filed) ☒ non-small entity is $ 130.

☐ 1. The statutory basic filing fee is:
- ☐ missing.
- ☐ insufficient.

Applicant must submit $_____ to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

☐ 2. The following additional claims fees are due:

$_____ for _____ total claims over 20.

$_____ for _____ independent claims over 3.

$_____ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☒ 3. The oath or declaration:
- ☒ is missing or unsigned.
- ☐ does not cover the newly submitted items.

An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the application by the above Application Number and Filing Date is required.

☐ 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

_____

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. **A $50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).**

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application was filed in a language other than English.
Applicant must file a verified English translation of the application, the $130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

☐ 9. OTHER: _____

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the reply.

Paul Brown

Customer Service Center
Initial Patent Examination Division (703) 308-1202

FORM PTO-1533 (REV. 9/98) U.S. GPO 1999 450-5875

PART 3 - OFFICE COPY

BARNES & THORNBURG

600 1st Source Bank Center
100 North Michigan
South Bend, Indiana 46601-1632 U.S.A.
(219) 233-1171
Fax (219) 237-1125

http://www.btlaw.com



January 11, 2000

Assistant Commissioner for Patents
Washington, D.C. 20231
Attention: Office of Initial Patent Examination
Customer Service Center

VIA EXPRESS MAIL
NO. EL433668734US

RECEIVED
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TC 2700 MAIL ROOM

Re: **U.S. Utility Patent Application Serial No. 09/442,089**
For: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Our Reference: 20742/54088

Dear Sir:

Enclosed for filing are:

(1) Request for Corrected Filing Receipt;
(2) Copy of Filing Receipt with Correction;
(3) Copy of Declaration and Power of Attorney with corrected name highlighted in yellow;
(4) Certificate of Mailing via Express Mail No. EL433668734US.

Please confirm receipt by date-stamping the enclosed filing receipt card and returning same to our offices. Please charge any shortage in fees and credit any overpayments to Barnes& Thornburg's Deposit Account No. 02-1007/20742/54088.

Sincerely,

BARNES & THORNBURG

Robert D. Null

RDN:les
Enclosures
cc: Chia-Pei Chang
Brian J. Connolly

SBDS02 RDN 193437

01-12-00 Receipt #7

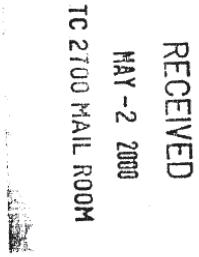
Attorney Docket No. 20742/54088
PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of:

Applicant:	Chia Pei Chang, et al.
Serial No.:	09/442,089
Filed:	October 21, 1999
For:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Group Art Unit:	2771



REQUEST FOR CORRECTED FILING RECEIPT

To: The Assistant Commissioner
for Patents
Washington, D.C. 20231
ATTENTION: Office of Initial Patent Examination
Customer Service Center

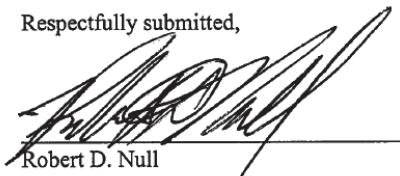
VIA EXPRESS MAIL
NO. EL433668734US

A copy of the official Filing Receipt for the above-identified patent application is attached. The Filing Receipt erroneously shows one of the Inventor's name to be "Erick." The correct spelling should be "Eric." A copy of the Declaration and Power of Attorney is attached, with the correct spelling highlighted in yellow.

Accordingly, Applicant respectfully requests that a corrected Filing Receipt be issued and sent to us showing the correct name information.

The above-noted error occurred through no fault of Applicant, and thus Applicant believes that no fee is due to correct the Filing Receipt. However, in the event that it is determined a fee is required, the Commissioner is hereby authorized to charge any fees which may be required to Barnes & Thornburg's Deposit Account No. 02-1007/20742/54088.

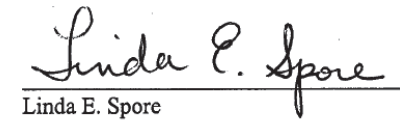
Respectfully submitted,



Robert D. Null
Registration No. 40,746
Telephone: (219) 233-1171

CERTIFICATE OF MAILING

The undersigned, Linda E. Spore, certifies that the foregoing Request for Corrected Filing Receipt, a copy of the Filing Receipt with the correction, a copy of the Declaration and Power of Attorney with the correction highlighted in yellow, and a Filing Receipt Card have been served upon the Assistant Commissioner for Patents by depositing same in the United States mail, via Express Mail No. EL433668734US this 11th day of January, 2000.



Linda E. Spore

SBDS02 RDN 193428

PTO 103X
(Rev. 6-99)

FILING RECEIPT

OIPE JC7 JAN 11 2000 PATENT & TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/442,089	10/21/99	2771	$1,012.00	20742/54088	6	34	3

ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

OIPE JC7 JAN 11 2000 PATENT & TRADEMARK OFFICE

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts of Application" ("Missing Parts Notice") in this application, please submit any corrections to this Filing Receipt with your reply to the "Missing Parts Notice." When the PTO processes the reply to the "Missing Parts Notice," the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s) CHIA-PEI CHANG, CHICAGO, IL; BRIAN J. CONNOLLY, HOFFMAN ESTATES, IL; ~~ERICK~~ ERIC BLACKLEDGE, WOODSTOCK, IL; ROBERT JOHN HOFFMAN, WHEELING, IL; BOB HOMAN, NILES, IL; KLAUS SCHULZ, DOWNERS GROVE, IL.

RECEIVED
MAY -2 2000
TC 2700 MAIL ROOM

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 12/08/99
TITLE
SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

PRELIMINARY CLASS: 707

RECEIVED
DEC 13 1999
BARNES & THORNBURG
SOUTH BEND

DATA ENTRY BY: BROWN, ROSCOE TEAM: 03 DATE: 12/08/99

(See reverse for new important information)

Attorney Docket No.: 20742/54088
PATENT

DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare: that my citizenship, residence and post office address are as stated below; that I verily believe I am the original, first and sole inventor (if only one is named below) or a joint inventor (if plural inventors are named below) of the invention entitled: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

the specification of which

(check one) X is attached hereto

was filed on _____ as Application Serial No. _____
and was amended on _____ (if applicable).

OIPE JAN 11 2000 PATENT & TRADEMARK OFFICE TC 2700

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

RECEIVED MAY -2 2000 MAIL ROOM

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby appoint as principal attorneys: Jerry E. Hyland, Reg. No. 20,904; William R. Coffey, Reg. No. 24,023; Perry Palan, Reg. No. 26,213; Paul B. Hunt, Reg. No. 37,154; Gerard T. Gallagher, Reg. No. 39,679; Robert D. Null, Reg. No. 40,746; Richard D. Conard, Reg. No. 27,321; Steven R. Lammert, Reg. No. 27,653; Richard A. Rezek, Reg. No. 30,796; Timothy E. Niednagel, Reg. No. 33,266; Bobby Brian Gillenwater, Reg. No. 31,105; Michael S. Gzybowski, Reg. No. 32,816; and Mark M. Newman, Reg. No. 31,472; to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to the following address:

Robert D. Null
Barnes & Thornburg
600 1st Source Bank Center
100 North Michigan Street
South Bend, Indiana 46601
(219) 233-1171

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

(Full Name) (Signature)

Date _____ Inventor Chia-Pei Chang _____

Residence 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657 Citizenship USA

Post Office Address 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657

Date _____ Inventor Brian J. Connolly _____

Residence 1539 Della Drive, Hoffman Estates, Illinois 60195 Citizenship USA

Post Office Address 1539 Della Drive, Hoffman Estates, Illinois 60195

Date _____ Inventor Eric Blackledge _____

Residence 14415 Westwood Trail, Woodstock, Illinois 60098 Citizenship USA

Post Office Address 14415 Westwood Trail, Woodstock, Illinois 60098

Date _____ Inventor Robert John Hoffman _____

Residence 120 LeMans Drive, Wheeling, Illinois 60090 Citizenship USA

Post Office Address 120 LeMans Drive, Wheeling, Illinois 60090

Date _____ Inventor Bob Homan _____

Residence 7081 W. Touhy Avenue, #305, Niles, Illinois 60714 Citizenship USA

Post Office Address 7081 W. Touhy Avenue, #305, Niles, Illinois 60714

Date _____ Inventor Klaus Schulz _____

Residence 4725 Woodward Avenue, Downers Grove, Illinois 60515 Citizenship USA

Post Office Address 4725 Woodward Avenue, Downers Grove, Illinois 60515

BARNES & THORNBURG



600 1st Source Bank Center
100 North Michigan
South Bend, Indiana 46601-1632 U.S.A.
(219) 233-1171
Fax (219) 237-1125
http://www.btlaw.com

RECEIVED
JAN 18 2000
Group 2700

January 12, 2000

Assistant Commissioner for Patents
Washington, D.C. 20231

VIA EXPRESS MAIL
NO. EL433668725US

Re: **U.S. Utility Patent Application Serial No. 09/442,089**
For: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Our Reference: 20742/54088

Dear Sir:

Enclosed for filing with the United States Patent and Trademark Office are an Information Disclosure Statement and Form PTO-1449 Information Disclosure Citation, together with the cited references. Please confirm receipt by date-stamping the enclosed filing receipt card and returning same to our offices.

If there are any shortages in fees, please charge them to Barnes & Thornburg's Deposit Account No. 02-1007/20742/54088.

Sincerely,

BARNES & THORNBURG

Robert D. Null

RDN:les
Enclosures
cc: Chia-Pei Chang
Brian J. Connolly

SBDS02 RDN 193452

01-13-00



GP 2771
2776

BARNES & THORNBURG
600 1st Source Bank Center
100 North Michigan
South Bend, Indiana 46601
(219) 233-1171

RECEIVED
JAN 18 2000
Group 2700

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit:	2771
Attorney Docket No.:	20742/54088
Applicant:	Chia-Pei Chang, et al.
Invention:	SYSTEMS FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Serial No:	09/442,089
Filed:	October 21, 1999
Examiner:	Unknown

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO-1449. It is respectfully requested that the references be expressly considered during the prosecution of this application, and that the references be made of record therein appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is being filed within three months of the U.S. filing date AND before the mailing date of the first Office Action on the merits. No certification or fee is required.

OIPE JC79 JAN 12 2000 PATENT & TRADEMARK OFFICE

None of the art cited is believed to disclose or suggest the invention recited in the claims of the above-identified application. It is therefore believed that the claimed invention is patentably distinguishable over these references.

Please charge any fees that might be due in connection with this Information Disclosure Statement to our Deposit Account No. 02-1007/20742-54088.

RECEIVED
JAN 10 2000
Group 2700

Respectfully submitted,

Robert D. Null
Registration No. 40,746
(219) 233-1171

RDN:les
Enclosures

CERTIFICATE OF MAILING

The undersigned, Linda E. Spore, certifies that the foregoing transmittal letter, Information Disclosure Statement, Form PTO-1449 with references cited therein, and Filing Receipt Card have been served upon the Assistant Commissioner for Patents by depositing same in the United States mail, via Express Mail No. EL433668725US this 12th day of January, 2000.

Linda E. Spore
Linda E. Spore

SBDS02 RDN 193447

OIPE JC79 JAN 12 2000 PATENT & TRADEMARK OFFICE

#3

Sheet 1 of 1

FORM PTO-1449 (REV. 7-80)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO.	SERIAL NO.
20742/54088	09/442,089
APPLICANT: Chia-Pei Chang, et al.	
FILING DATE: October 21, 1999	GROUP: 2771

LIST OF DOCUMENTS CITED BY APPLICANT
(Use several sheets if necessary)

RECEIVED JAN 16 2000 Group 2700

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
SA		5,297,279	03/22/94	Bannon et al.	707	103R	
		5,369,778	11/29/94	San Soucie et al.	707	103	
		5,390,330	02/14/95	Talati	717	3	
		5,428,791	06/27/95	Andrew et al.	717	3	
		5,542,078	07/30/96	Martel et al.	707	101	
		5,566,330	10/15/96	Sheffield	707	4	
		5,596,744	01/21/97	Dao et al.	707	10	
		5,634,053	05/27/97	Noble et al.	707	4	
		5,634,124	05/27/97	Khoyi et al.	707	103	
		5,692,183	11/25/97	Hapner et al.	707	103	
		5,745,765	04/28/98	Paseman	717	1	
		5,764,973	06/09/98	Lunceford et al.	707	1	
		5,781,905	07/14/98	Awane et al.	702	102	
		5,850,548	12/15/98	Williams	717	1	
		5,857,194	01/05/99	Kelliher et al.	707	101	
		5,862,372	01/19/99	Morris et al.	717	1	
		5,875,330	02/23/99	Goti	717	1	
		5,878,425	03/02/99	Redpath	707	102	
		5,884,079	03/16/99	Furusawa	717	1	
		5,893,911	04/13/99	Piskiel et al.	707	10	
		5,924,101	07/13/99	Bach et al.	707	103	
		5,946,694	08/31/99	Copeland et al.	707	103	
SA		5,950,001	09/07/99	Hamilton et al.	717	1	

S Klein 8/10/01

BARNES & THORNBURG



600 One Summit Square
Fort Wayne, Indiana 46802
(219) 423-9440

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit:	2771
Attorney Docket No.:	20742/54088
Applicant:	Chia-Pei Chang et al.
Invention:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Serial No:	09/442,089
Filed:	October 21, 1999
Examiner:	Unknown

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Missing Part, Assistant Commissioner of Patents, Washington, D.C. 20231

on February 4, 2000

Michelle L. Sengthong

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

BOX: MISSING PART
Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

In response to the Notice to File Missing Parts of Application mailed December 8, 1999, in connection with the above-identified Application, applicant respectfully submits the following.

In the Notice to File Missing Parts of Application, it is indicated that the Application was filed with an unsigned Oath or Declaration.

Applicants are hereby submitting a Declaration and Power of Attorney form which has been duly signed by the inventors.

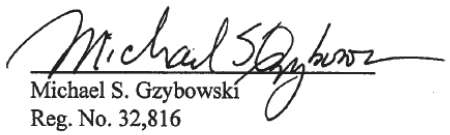
The Notice to File Missing Parts of Application further indicates that a surcharge of $130.00, as set forth in 37 CFR 1.16(e) is required.

Also being submitted herewith is a Verified Statement Claiming Small Entity Status for a Small Business Concern. Therefore, a check in the amount of $65.00 covering the surcharge as required under 37 CFR 1.16(e) is being submitted herewith as well.

Also submitted herewith is a copy of the Notice to File Missing Parts of Application.

Please charge any additional fees due in connection with the filing of this paper, including any Extension of Time fees to deposit account number 02-1007 and please credit any excess fees to such deposit account.

Respectfully submitted,



Michael S. Gzybowski
Reg. No. 32,816
(219) 423-9440

MSG:mls
Enclosure
FWDS01 MSG 119337

Attorney Docket No.: 20742/54088

PATENT

(3)

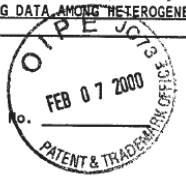
DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare: that my citizenship, residence and post office address are as stated below; that I verily believe I am the original, first and sole inventor (if only one is named below) or a joint inventor (if plural inventors are named below) of the invention entitled: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

the specification of which

(check one) X is attached hereto

____ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable).



I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority	Claimed
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby appoint as principal attorneys: Jerry E. Hyland, Reg. No. 20,904; William R. Coffey, Reg. No. 24,023; Perry Palan, Reg. No. 26,213; Paul B. Hunt, Reg. No. 37,154; Gerard T. Gallagher, Reg. No. 39,679; Robert D. Null, Reg. No. 40,746; Richard D. Conard, Reg. No. 27,321; Steven R. Lammert, Reg. No. 27,653; Richard A. Rezek, Reg. No. 30,796; Timothy E. Niednagel, Reg. No. 33,266; Bobby Brian Gillenwater, Reg. No. 31,105; Michael S. Gzybowski, Reg. No. 32,816; and Mark M. Newman, Reg. No. 31,472; to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to the following address:

Robert D. Null
Barnes & Thornburg
600 1st Source Bank Center
100 North Michigan Street
South Bend, Indiana 46601
(219) 233-1171

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

(Full Name) (Signature)

Date 1/19/00 Inventor Chia-Pei Chang

Residence 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657 Citizenship USA

Post Office Address 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657

Date 1/18/00 Inventor Brian J. Connolly

Residence 1539 Della Drive, Hoffman Estates, Illinois 60195 Citizenship USA

Post Office Address 1539 Della Drive, Hoffman Estates, Illinois 60195

Date 1/19/00 Inventor Eric Blackledge
Residence 14415 Westwood Trail, Woodstock, Illinois 60098 Citizenship USA
Post Office Address 14415 Westwood Trail, Woodstock, Illinois 60098

Date 1/24/00 Inventor Robert John Hoffman
Residence 120 LeMans Drive, Wheeling, Illinois 60090 Citizenship USA
Post Office Address 120 LeMans Drive, Wheeling, Illinois 60090

Date 1/19/00 Inventor Bob Homan
Residence 7081 W. Touhy Avenue, #305, Niles, Illinois 60714 Citizenship USA
Post Office Address 7081 W. Touhy Avenue, #305, Niles, Illinois 60714

Date 1/19/2000 Inventor Klaus Schulz
Residence 4725 Woodward Avenue, Downers Grove, Illinois 60515 Citizenship USA
Post Office Address 4725 Woodward Avenue, Downers Grove, Illinois 60515

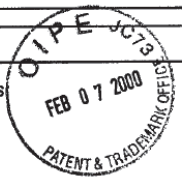
SBDS02 RDN 187899

Atto. Docket No.: 20742/54088
PATENT

Applicant(s) or Patentee: Chia-Pei Chang, Brian J. Connolly, Eric Blackledge, Robert John Hoffman, Bob Homan and Klaus Schulz

Serial [X] Patent [ ] No.: 09/442,089
Filed [X] Issued [ ] October 21, 1999

For: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS



VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 C.F.R. 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

[ ] the owner of the small business concern identified below:
[X] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Darc Development Partners, Inc.

ADDRESS OF CONCERN 125 South Wacker Drive, #2550, Chicago, Illinois 60606

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 C.F.R. § 121.3-18, and reproduced in 37 C.F.R. § 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
by inventor(s) Chia-Pei Chang, Brian J. Connolly, Eric Blackledge, Robert John Hoffman, Bob Homan and Klaus Schulz

described in

[ ] the specification filed herewith
[X] application serial no. 09/442,089, filed October 21, 1999
[ ] patent no. _____, issued _____.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 C.F.R. § 1.9(d) or by any concern which would not qualify as a small business concern under 37 C.F.R. § 1.9(d) or a nonprofit organization under 37 C.F.R. § 1.9(e).
*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 C.F.R. § 1.27)

NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGAN.

NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGAN.

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. § 1.28(b)).

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Brian J. Connolly

TITLE OF PERSON OTHER THAN OWNER Executive Vice President

ADDRESS OF PERSON SIGNING 1539 Della Drive, Hoffman Estates IL 60195

SIGNATURE Brian J Connolly DATE 1/17/00

SBDS02 RDN 10/99

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
09/442,089	10/21/99	CHANG	C 20742/54088

0222/120

ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

NOT ASSIGNED

2771

DATE MAILED: 12/08/99

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). **If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of ☐ $65.00 for a small entity in compliance with 37 CFR 1.27, or ☒ $130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.**

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☐ small entity (statement filed) ☒ non-small entity is $ 130.

☐ 1. The statutory basic filing fee is:
- ☐ missing.
- ☐ insufficient.

Applicant must submit $_____ to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

☐ 2. The following additional claims fees are due:

$_____ for _____ total claims over 20.

$_____ for _____ independent claims over 3.

$_____ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☒ 3. The oath or declaration:
- ☒ is missing or unsigned.
- ☐ does not cover the newly submitted items.

An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date is required.

☐ 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

_____

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s) identifying this application by the above Application Number and Filing Date, is required.

☐ 6. **A $50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).**

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application was filed in a language other than English.

Applicant must file a verified English translation of the application, the $130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

☐ 9. OTHER: _____

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202

FORM PTO-1533 (REV. 9/98) U.S. GPO 1[illegible] 45[illegible]575

PART 2 - COPY TO BE RETURNED WITH RESPONSE

BARNES & THORNBURG



600 1st Source Bank Center
100 North Michigan
South Bend, Indiana 46601-1632 U.S.A.
(219) 233-1171
Fax (219) 237-1125

http://www.btlaw.com

EL433668734US

January 11, 2000

Assistant Commissioner for Patents
Washington, D.C. 20231
Attention: Office of Initial Patent Examination
Customer Service Center

VIA EXPRESS MAIL
NO. EL433668734US

RECEIVED
APR -5 2000
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Re: **U.S. Utility Patent Application Serial No. 09/442,089**
For: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Our Reference: 20742/54088

Dear Sir:

Enclosed for filing are:

(1) Request for Corrected Filing Receipt;
(2) Copy of Filing Receipt with Correction;
(3) Copy of Declaration and Power of Attorney with corrected name highlighted in yellow;
(4) Certificate of Mailing via Express Mail No. EL433668734US.

Please confirm receipt by date-stamping the enclosed filing receipt card and returning same to our offices. Please charge any shortage in fees and credit any overpayments to Barnes& Thornburg's Deposit Account No. 02-1007/20742/54088.

Sincerely,

BARNES & THORNBURG

Robert D. Null

RDN:les
Enclosures
cc: Chia-Pei Chang
Brian J. Connolly

SBDS02 RDN 193437

PERMANENT FILE COPY



Attorney Docket No. 20742/54088
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of:

Applicant:	Chia Pei Chang, et al.
Serial No.:	09/442,089
Filed:	October 21, 1999
For:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS
Group Art Unit:	2771

REQUEST FOR CORRECTED FILING RECEIPT

To: The Assistant Commissioner
for Patents
Washington, D.C. 20231
ATTENTION: Office of Initial Patent Examination
Customer Service Center

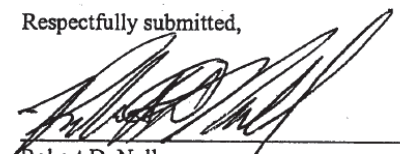
VIA EXPRESS MAIL
NO. EL433668734US

A copy of the official Filing Receipt for the above-identified patent application is attached. The Filing Receipt erroneously shows one of the Inventor's name to be "Erick." The correct spelling should be "Eric." A copy of the Declaration and Power of Attorney is attached, with the correct spelling highlighted in yellow.

Accordingly, Applicant respectfully requests that a corrected Filing Receipt be issued and sent to us showing the correct name information.

The above-noted error occurred through no fault of Applicant, and thus Applicant believes that no fee is due to correct the Filing Receipt. However, in the event that it is determined a fee is required, the Commissioner is hereby authorized to charge any fees which may be required to Barnes & Thornburg's Deposit Account No. 02-1007/20742/54088.

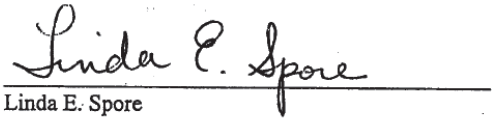
Respectfully submitted,



Robert D. Null
Registration No. 40,746
Telephone: (219) 233-1171

CERTIFICATE OF MAILING

The undersigned, Linda E. Spore, certifies that the foregoing Request for Corrected Filing Receipt, a copy of the Filing Receipt with the correction, a copy of the Declaration and Power of Attorney with the correction highlighted in yellow, and a Filing Receipt Card have been served upon the Assistant Commissioner for Patents by depositing same in the United States mail, via Express Mail No. EL433668734US this 11th day of January, 2000.



Linda E. Spore

FILE COPY Receipt

BARNES & THORNBURG

OIPE JC79 MAR 21 2000 PATENT & TRADEMARK OFFICE

600 One Summit Square
Fort Wayne, Indiana 46802 U.S.A.
(219) 423-9440
Fax (219) 424-8316
http://www.btlaw.com

Bobby B. Gillenwater
(219) 425-4649
Email: bgillenw@btlaw.com

16

March 13, 2000

RECEIVED
APR -5 2000
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Assistant Commissioner for Patents
Washington, D.C. 20231-9998
ATTENTION: Application Processing
Division Customer Correction Branch

Re: U.S. Patent Application Serial No. 09/442,089
For: "SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS"
Our Reference: 20742/54088

Dear Sir:

On January 11, 2000, we filed a Request for Corrected Filing Receipt with the Patent and Trademark Office requesting that the spelling of the third named inventor name be corrected. A copy of our Request for Corrected Filing Receipt filed on January 11, 2000, is attached. On March 10, 2000, we received a "corrected" Filing Receipt (copy attached). However, the correct spelling of the inventors name is still not shown on the "corrected" Filing Receipt. We again ask that the Filing Receipt be corrected to show the corrected inventors name: "Eric." Please confirm receipt by date stamping the enclosed filing receipt card and return same to our offices.

Please charge any fees which might be due to Barnes & Thornburg's Deposit Account No. 02-1010.

Respectfully submitted,

BARNES & THORNBURG

Bobby B. Gillenwater
Reg. No. 31, 105
(219) 423-9440

BBG:rbr
Enclosures
FWDS01 RSK 120930

PTO-103X
(Rev. 6-99)

FILING RECEIPT

CORRECTED





UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/442,089	10/21/99	2771	$1,012.00	20742/54088	6	34	3

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ROBERT D NULL
BARNES & THORNBURG
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SOUTH BEND IN 46601

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts of Application" ("Missing Parts Notice") in this application, please submit any corrections to this Filing Receipt with your reply to the "Missing Parts Notice." When the PTO processes the reply to the "Missing Parts Notice," the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s) CHIA-PEI CHANG, CHICAGO, IL; BRIAN J. CONNOLLY, HOFFMAN ESTATES, IL; ERICK BLACKLEDGE, WOODSTOCK, IL; ROBERT JOHN HOFFMAN, WHEELING, IL; BOB HOMAN, NILES, IL; KLAUS SCHULZ, DOWNERS GROVE, IL.

Eric

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 12/08/99
TITLE
SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

PRELIMINARY CLASS: 707

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MAR 10 2000
BARNES & THORNBURG
SOUTH BEND

DATA ENTRY BY: JONES, KIMBERLY TEAM: 08 DATE: 02/03/00

LICENSE FOR FOREIGN FILING U)ER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "FOREIGN FILING LICENSE GRANTED" followed by a date appears on the reverse side of this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.11. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related application(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations, especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR Parts 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "FOREIGN FILING LICENSE GRANTED" DOES NOT appear on the reverse side of this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PLEASE NOTE ---- The Following Information about the Filing Receipt:

The articles such as "a," "an" and "the" are not included as the first words in the title of an application. They are considered to be unnecessary to the understanding of the title.

The words "new," "improved," "improvement," "improvements in or relating to" are not included as the first words in the title of an application because a patent application is, by nature, a new idea or improvement.

The title may be truncated if it consists of more than 4 lines of 70 characters each (letters and spaces combined).

The inventor information may be truncated if the family name consists of more than 25 characters (letters and spaces combined) and if the given name consists of more than 25 characters (letters and spaces combined). The inventor's residence allows for up to 40 characters (letters and spaces combined).

The docket number allows a maximum of 12 characters.

If your application was submitted under 37 CFR 1.10, your filing date should be the "date in" found on the Express Mail label. If there is a discrepancy, you should submit a request for a corrected Filing Receipt along with a copy of the Express Mail label showing the "date in."

Customer Address may have been modified to conform to U.S. Postal rules.

Please direct correction, including a copy of your Filing Receipt, to:

Assistant Commissioner for Patents
Office of Initial Patent Examination
Customer Service Center
Washington, DC 20231

PTO-103X
(Rev. 6-99)

FILING RECEIPT





UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
09/442,089	10/21/99	2771	$1,012.00	20742/54088	6	34	3

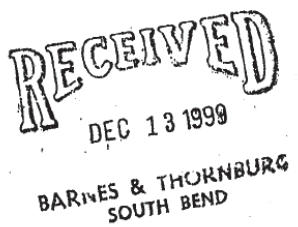
ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts of Application" ("Missing Parts Notice") in this application, please submit any corrections to this Filing Receipt with your reply to the "Missing Parts Notice." When the PTO processes the reply to the "Missing Parts Notice," the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s) CHIA-PEI CHANG, CHICAGO, IL; BRIAN J. CONNOLLY, HOFFMAN ESTATES, IL; ~~ERICK~~ ERIC BLACKLEDGE, WOODSTOCK, IL; ROBERT JOHN HOFFMAN, WHEELING, IL; BOB HOMAN, NILES, IL; KLAUS SCHULZ, DOWNERS GROVE, IL.

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 12/08/99
TITLE
SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

PRELIMINARY CLASS: 707



DATA ENTRY BY: BROWN, ROSCOE TEAM: 03 DATE: 12/08/99

(See reverse for new important information)



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Time In ☐ AM ☐ PM	Military ☐ 2nd Day ☐ 3rd Day	Return Receipt Fee	Delivery Date Mo. Day	Time ☐ AM ☐ PM	Employee Signature
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BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 N MICHIGAN ST
SOUTH BEND IN 46601-1632
Attention: Robert D. Null, Esq.
20742/54088 January 11, 2000

TO: (PLEASE PRINT) PHONE ( )

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Patent ☒ Trademark ☐ Copyright ☐ Atty Docket No. 20742/54088

Serial/Reg/Pat No. 09/442,089 File/Grant Date 10/21/99

Applicant(s) Chia-Pei Chang, et al.

Papers filed herewith on January 11, 2000

☐	Fees $_____	☐	Assignment
☐	New-Formal Application	☐	Verified Statement Small Entity
☐	Continued Prosec. Application	☐	Fee Calculation Sheet
☐	Division-Continuation Program	☐	PTO-1594/1595-Record Cover
☐	Declaration & Power of Atty	☐	Information Disclosure Statement
☐	Statement of Use	☐	Request for Extension of Time
☐	Drawing Sheet	☐	Response/Amendment
☐	Part B-Issue Fee Transmittal Sheet	☐	___Sheets of __Formal Drawings
☐	_____Specimens	☐	Sections 8 & 15 Declaration
■	Other Certificate of Mailing via Express Mail No. EL433668734US		

Request for Corrected Filing Receipt, copy of filing receipt (corrected), copy of Declaration (correction highlighted in yellow)

Receipt is herby acknowledged of the papers filed as indicated above in connection with the above-identified case. COMMISSIONER OF PATENTS AND TRADEMARKS

RDN:les



Attorney Docket No.: 20742/54088
PATENT

DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare: that my citizenship, residence and post office address are as stated below; that I verily believe I am the original, first and sole inventor (if only one is named below) or a joint inventor (if plural inventors are named below) of the invention entitled: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

the specification of which

(check one) X is attached hereto

____ was filed on _____ as Application Serial No. _____
and was amended on _____.
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority	Claimed
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby appoint as principal attorneys: _____
Jerry E. Hyland, Reg. No. 20,904; William R. Coffey, Reg. No. 24,023; Perry Palan, Reg. No. 26,213; Paul B. Hunt, Reg. No. 37,154; Gerard T. Gallagher, Reg. No. 39,679; Robert D. Null, Reg. No. 40,746; Richard D. Conard, Reg. No. 27,321; Steven R. Lammert, Reg. No. 27,653; Richard A. Rezek, Reg. No. 30,796; Timothy E. Niednagel, Reg. No. 33,266; Bobby Brian Gillenwater, Reg. No. 31,105; Michael S. Gzybowski, Reg. No. 32,816; and Mark M. Newman, Reg. No. 31,472; to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to the following address:

Robert D. Null
Barnes & Thornburg
600 1st Source Bank Center
100 North Michigan Street
South Bend, Indiana 46601
(219) 233-1171

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

(Full Name) (Signature)

Date _____ Inventor Chia-Pei Chang _____

Residence 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657 Citizenship USA

Post Office Address 2843 N. Lincoln Avenue, #106, Chicago, Illinois 60657

Date _____ Inventor Brian J. Connolly _____

Residence 1539 Della Drive, Hoffman Estates, Illinois 60195 Citizenship USA

Post Office Address 1539 Della Drive, Hoffman Estates, Illinois 60195



Date _____ Inventor Eric Brackledge _____

Residence 14415 Westwood Trail, Woodstock, Illinois 60098 Citizenship USA

Post Office Address 14415 Westwood Trail, Woodstock, Illinois 60098

Date _____ Inventor Robert John Hoffman _____

Residence 120 LeMans Drive, Wheeling, Illinois 60090 Citizenship USA

Post Office Address 120 LeMans Drive, Wheeling, Illinois 60090

Date _____ Inventor Bob Homan _____

Residence 7081 W. Touhy Avenue, #305, Niles, Illinois 60714 Citizenship USA

Post Office Address 7081 W. Touhy Avenue, #305, Niles, Illinois 60714

Date _____ Inventor Klaus Schulz _____

Residence 4725 Woodward Avenue, Downers Grove, Illinois 60515 Citizenship USA

Post Office Address 4725 Woodward Avenue, Downers Grove, Illinois 60515

GP/2771
2171

BARNES & THORNBURG
600 One Summit Square
Fort Wayne, Indiana 46802
(219) 423-9440

#8
5/15/01



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Form: PTO/SB/21 (6-98)

Customer No.:	**23641**
Application No.:	09/442,089
Filing Date:	October 21, 1999
Group Art Unit:	2771
Examiner Name:	Unknown
Attorney Docket No.:	20742/54088
First Named Inventor:	Chia-Pei Chang
Title:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231

on May 3, 2001

Stacey E. Tolan

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Technology Center 2100

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 124

ENCLOSURES (check all that apply)

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☒ **Information Disclosure Statement (Supplemental) (4 pages)(2 references)**
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers (for an Application)
- ☐ Drawing(s)
- ☐ Licensing-relating Papers
- ☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition

☐ Petition to Convert to a Provisional Application

☐ Power of Attorney, Revocation Change of Correspondence Address

☐ Terminal Disclaimer

☐ Small Entity Statement

☐ Request for Refund

☐ After Allowance Communication to Group

☐ Appeal Communication to Board of Appeals and Interferences

Remarks:

☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)

☐ Proprietary Information

☐ Status Letter

☒ **Additional Enclosure(s)**
(please identify below):
Receipt Postcard (1)
2 References to IDS (116 pages)
European Search Report (3 pages)

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Scott M. Lohnes
Reg. No. 45,451

Date: May 3, 2001

FWDS01 SML 137386



BARNES & THORNBURG
600 One Summit Square
Fort Wayne, Indiana 46802
(219) 423-9440

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Customer No.:	**23641**
Application No.:	09/442,089
Filing Date:	October 21, 1999
First Named Inventor:	Chia-Pei Chang
Examiner Name:	Unknown
Group Art Unit:	2771
Attorney Docket No.:	20742/54088
Title:	System for Integrating Data Among Heterogeneous Systems

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231

on May 3, 2001

Stacey E. Tolar

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Technology Center 2100

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. §§1.56, 1.97 and 1.98, Applicant and the undersigned hereby disclose to the Examiner the references listed on the attached Form PTO/SB/08.

This Supplemental Information Disclosure Statement is being filed after three months of the U.S. filing date AND before the mailing date of the first Office Action on the merits.

Each English language reference was cited in a corresponding foreign application search report or office action three months prior to the filing of this Supplemental Information Disclosure Statement, and its relevance is discussed therein. A copy of the foreign search report or office action is attached for the Examiner's information. No certification or fee is required.

No representation is intended that a complete search has been made of the prior art, or that prior art references other than those listed on the attached form are not available. The citation of this reference shall not be construed to be an admission that the information cited in the statement is considered material to patentability of the subject invention.

Please credit any overpayments or charge any additional fees to the Deposit Account of Barnes & Thornburg, Account Number 02-1010.

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MAY 11 2001
Technology Center 2100

Respectfully submitted,



Scott M. Lohnes
Reg. No. 45,451
(219) 423-9440

Date: May 3, 2001

FWDS01 SML 136862

FORM PTO/SB/08A (REV. 10-96)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	Complete if Known	
Substitute for form 1449A/PTO		Application Number	09/442,089
		Filing Date	October 21, 1999
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		First Named Inventor	Chia-Pei Chang
		Group Art Unit	2771
(Use several sheets if necessary)		Examiner Name	Unknown
Sheet 1 of 2		Attorney Docket Number	20742-54088

MAY 07 2001 PATENT AND TRADEMARK OFFICE TC 2100

RECEIVED MAY 11 2001 Technology Center 2100

U.S. PATENT DOCUMENTS

*Examiner Initials	Cite No.[1]	U.S. Patent Document Number	U.S. Patent Document Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A.A					
	A.B					
	A.C					
	A.D					
	A.E					
	A.F					
	A.G					
	A.H					
	A.I					
	A.J					

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Foreign Patent Document Number[4]	Foreign Patent Document Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
SA	A.K	EP	1 016 989	A2	Yee, et al	05-07-2000	Abstract, page 2, line 1 - page 4, line 44, relevant to claims 1-34	
	A.L							
	A.M							
	A.N							
	A.O							

EXAMINER	S A Lam	DATE CONSIDERED	8/10/01

*EXAMINER: Initial reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Unique citation designation number. [2] See attached Kinds of U.S. Patent Documents. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 If possible. [6] Applicant is to place a check mark here if English language Translation is attached.

Send to: Assistant Commissioner for Patents, Washington, D.C. 20231.

FORM PTO/SB/08B (REV. 10-96)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE			Complete if Known	
Substitute for form 1449B/PTO				Application Number	09/442,089
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Filing Date	October 21, 1999
				First Named Inventor	Chia-Pei Chang
(Use as many sheets necessary)				Group Art Unit	2771
				Examiner Name	Unknown
Sheet	2	of	2	Attorney Docket Number	20742-54088

MAY 0 7 2001

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	B.A	BLANCO, JOSE, et al., Building a Federated Relational Database System: An Approach Using A Knowledge-Based System, International Journal of Intelligent & Cooperative Information Systems, December 1994, Volume 3, Number 4, pages 415-55.	
	B.B		
	B.C		
	B.D		
	B.E		
	B.F		
	B.G		
	B.H		
	B.I		
	B.J		
	B.K		

RECEIVED
MAY 1 1 2001
Technology Center 2100

EXAMINER		DATE CONSIDERED	8/10/01

*EXAMINER: Initial reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Unique citation designation number. [2] Applicant is to place a check mark here if English language Translation is attached.

SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231

Other Prior Art

According to the information contained in form PTO-1449 or PTO-892, there are one or more other prior art/non-patent literature documents missing from the original file history record obtained from the United States Patent and Trademark Office. Upon your request we will attempt to obtain these documents from alternative resources. Please note that additional charges will apply for this service.

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

ATENT COOPERATION TREA

FILE COPY 210

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Form PCT/ISA/210 (first sheet) (July 1998) **DO NOT MAIL**

Applicant's or agent's file reference 20742-82298	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US00/41401	International filing date *(day/month/year)* 20 OCTOBER 2000	(Earliest) Priority Date *(day/month/year)* 21 OCTOBER 1999
Applicant DARC CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of ____ sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readable form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has b een furnished.

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT
Form PCT/ISA/210 (second sheet) (July 1998)
FILE COPY - DO NOT MAIL

I. International application No.
PCT/US00/41401

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :G06F 17/30
US CL : 707/10, 100, 103, 104; 709/310, 312; 717/1, 3.
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)
U.S. : 707/10, 100, 103, 104; 709/310, 312; 717/1, 3.

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	EP 1,016,989 A2 (YEE et al) 18 November 1999, abstract, page 2, line 1- page 4, line 44.	1-34
A	BLANCO, JOSE et al, Building a Federated Relational Database System: An Approach Using A Knowledge-Based System, International Journal of Intelligent & Cooperative Information Systems, December 1994, Volume: 3, Number 4, pages 415-55.	1-34

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 22 FEBRUARY 2001	Date of mailing of the international search report
Facsimile No. (703) 305-3230	Authorized officer AND Telephone No. SHAHID ALAM (703) 305-2358

Notice of Allowability	Application No.	Applicant(s)	
	09/442,089	CHANG ET AL.	
	Examiner	Art Unit	
	Shahid Al Alam	2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the application filed on October 21, 1999*.
2. ☒ The allowed claim(s) is/are *1-34*.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
   (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

8. ☒ CORRECTED DRAWINGS must be submitted.
   (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☒ hereto or 2) ☐ to Paper No. ____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
   (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the top margin (not the back) of each sheet. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1☒ Notice of References Cited (PTO-892)
3☒ Notice of Draftperson's Patent Drawing Review (PTO-948)
5☒ Information Disclosure Statements (PTO-1449), Paper No. *5,8*.
7☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
2☐ Notice of Informal Patent Application (PTO-152)
4☐ Interview Summary (PTO-413), Paper No.____ .
6☐ Examiner's Amendment/Comment
8☒ Examiner's Statement of Reasons for Allowance
9☐ Other

HOSAIN T. ALAM
PRIMARY EXAMINER

DETAILED ACTION

1. This action is in response to the application filed on October 21, 1999.

2. After a search and a thorough examination of the present application and in light of the prior art made of record, claims 1-34 are allowed.

3. The application having been allowed, formal drawings are required in response to this office action.

Reasons For Allowance

4. The following is an examiner's statement of reasons for allowance:

The prior art of record does not teach or fairly suggest a system in combination elements as recited in claims 1, 23 and 34 wherein, an interfacer for populating the destination applications with data from the temporary data storage after the data is processed by the active component, the active component processing the data by communicating with the first module and activating data element chains according to instruction sets of the first module.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shahid Al Alam whose telephone number is (703) 305-2358. The examiner can normally be reached on Monday - Thursday 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y. Vu can be reached on (703) 305-4393. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-5403 for regular communications and (703) 305-9724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Shahid Al Alam
Examiner
Art Unit 2172
August 12, 2001

HOSAIN T. ALAM
PRIMARY EXAMINER

Notice of References Cited	Application/Control No. 09/442,089	Applicant(s)/Patent Under Reexamination CHANG ET AL.	
	Examiner Shahid Al Alam	Art Unit 2172	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification	
*	A	US-4873630	10-1989	Rusterholz et al.	712	3
*	B	US-5210870	05-1993	Baum et al.	707	7
*	C	US-5504885	04-1996	Alashqur	707	100
*	D	US-5548769	08-1996	Baum et al.	707	1
*	E	US-5634053	05-1997	Noble et al.	707	4
*	F	US-5721912	02-1998	Stepczyk et al.	707	102
*	G	US-5970490	10-1999	Morgenstern	707	10
*	H	US-5974413	10-1999	Beauregard et al.	707	6
*	I	US-6185629	02-2001	Simpson et al.	707	10
*	J	US-6236994	05-2001	Swartz et al.	707	6
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification	
	N						
	O						
	P						
	Q						
	R						
	S						
	T						

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Hsu, Cheng et al., "A Metadata System For Information Modeling And Integration", Proceedings of the First International Conference on Systems Integration, 22-26 April 1990, Pages 616-624.
	V	Huang, Jer-Wen, "MultiBase: A Heterogeneous Multidatabase Management System", Proceedings of the Eighteenth Annual International Computer Software and Applications Conference. COMPSAC 94. 9-11 November 1994, Pages 332-339.
	W	Lim, Ee-Peng et al., "A Relational Interface for Heterogeneous Information Sources", Proceedings of the IEEE International Forum on Research and Technology Advances in Digital Libraries, 1997. ADL '97. 7-9 May 1997, Pages 128-139.
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Other Prior Art

According to the information contained in form PTO-1449 or PTO-892, there are one or more other prior art/non-patent literature documents missing from the original file history record obtained from the United States Patent and Trademark Office. Upon your request we will attempt to obtain these documents from alternative resources. Please note that additional charges will apply for this service.

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

Form PTO 948 (Rev. 8-98) U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office Application No. 09/442089

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 10/2/99 are:

A. ☐ approved by the Draftsperson under 37 CFR 1.84 or 1.152.

B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be sumitted according to the instructions on the back of this notice.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color.
   - ___ Color drawings are not acceptable until petiton is granted. Fig(s) _____
   - ___ Pencil and non black ink not permitted. Fig(s) _____
2. PHOTOGRAPHS. 37 CFR 1.84 (b)
   - ___ 1 full-tone set is required. Fig(s) _____
   - ___ Photographs not properly mounted (must use brystol board or photographic double-weight paper). Fig(s) _____
   - ___ Poor quality (half-tone). Fig(s) _____
3. TYPE OF PAPER. 37 CFR 1.84(e)
   - ___ Paper not flexible, strong, white, and durable. Fig(s) _____
   - ___ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) _____
   - ___ Mylar, velum paper is not acceptable (too thin). Fig(s) _____
4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:
   - ___ 21.0 cm by 29.7 cm (DIN size A4)
   - ___ 21.6 cm by 27.9 cm (8 1/2 x 11 inches)
   - ___ All drawing sheets not the same size. Sheet(s) _____
   - ___ Drawings sheets not an acceptable size. Fig(s) _____
5. MARGINS. 37 CFR 1.84(g): Acceptable margins:

   Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm
   SIZE: A4 Size

   Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
   SIZE: 8 1/2 x 11

   Margins not acceptable. Fig(s) 1-6
   - ☒ Top (T) ☒ Left (L)
   - _____ Right (R) _____ Bottom (B)
6. VIEWS. 37 CFR 1.84(h)

   REMINDER: Specification may require revision to correspond to drawing changes.

   Partial views. 37 CFR 1.84(h)(2)
   - ___ Brackets needed to show figure as one entity. Fig(s) _____
   - ___ Views not labeled separately or properly. Fig(s) _____
   - ___ Enlarged view not labeled separetely or properly. Fig(s) _____
7. SECTIONAL VIEWS. 37 CFR 1.84 (h)(3)
   - ___ Hatching not indicated for sectional portions of an object. Fig(s) _____
   - ___ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____
8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
   - ___ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____
9. SCALE. 37 CFR 1.84(k)
   - ___ Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____
10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(i)
    - ☒ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) 1-6
11. SHADING. 37 CFR 1.84(m)
    - ___ Solid black areas pale. Fig(s) _____
    - ___ Solid black shading not permitted. Fig(s) _____
    - ___ Shade lines, pale, rough and blurred. Fig(s) _____
12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)
    - ☒ Numbers and reference characters not plain and legible. Fig(s) 1-6
    - ___ Figure legends are poor. Fig(s) _____
    - ___ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____
    - ___ English alphabet not used. 37 CFR 1.84(p)(2) Figs _____
    - ___ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) _____
13. LEAD LINES. 37 CFR 1.84(q)
    - ___ Lead lines cross each other. Fig(s) _____
    - ___ Lead lines missing. Fig(s) _____
14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)
    - ___ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) _____
15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
    - ___ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____
16. CORRECTIONS. 37 CFR 1.84(w)
    - ___ Corrections not made from prior PTO-948 dated _____
17. DESIGN DRAWINGS. 37 CFR 1.152
    - ___ Surface shading shown not appropriate. Fig(s) _____
    - ___ Solid black shading not used for color contrast. Fig(s) _____

COMMENTS

REVIEWER N.D DATE 8/13/01 TELEPHONE NO. _____

ATTACHMENT TO PAPER NO. 9

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities--37 CFR 1.85

File new drawings with the changes incorporated therein. The application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application, should be placed on the back of each sheet of drawings in accordance with 37 CFR 1.84(c). Applicant may delay filing of the new drawings until receipt of the Notice of Allowability (PTOL-37). Extensions of time may be obtained under the provisions of 37 CFR 1.136. The drawing should be filed as a separate paper with a transmittal letter addressed to the Drawing Processing Branch.

2. Timing for Corrections

Applicant is required to submit **acceptable** corrected drawings within the three-month shortened statutory period set in the Notice of Allowability (PTOL-37). If a correction is determined to be unacceptable by the Office, applicant must arrange to have acceptable corrections resubmitted within the original three-month period to avoid the necessity of obtaining an extension of time and paying the extension fee. Therefore, applicant should file corrected drawings as soon a possible.

Failure to take corrective action within set (or extended) period will result in **ABANDONMENT** of the Application.

3. Corrections other than Informalities Noted by the Drawing Review Branch on the Form PTO-948

All changes to the drawings, other than informalities noted by the Drawing Review Branch, **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

TM31/0814

ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT		DATE MAILED
09/442,089	10/21/99	034	ALAM, S	2172	08/14/01

First Named Applicant		
CHANG,	35 USC 154(b) term ext. =	0 Days.

TITLE OF INVENTION: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 20742/54088	707-100.000	K58	UTILITY	YES	$620.00	11/14/01

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV. 10-96) Approved for use through 06/30/99. (0651-0033)



SRD 12

BARNES & THORNBURG
600 One Summit Square
Fort Wayne, Indiana 46802
(219) 423-9440

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Form: PTO/SB/21 (6-98)

Customer No.:	**23641**
Application No.:	09/442,089
Filing Date:	October 21, 1999
Group Art Unit:	2172
Batch No.:	K58
Examiner Name:	Unknown
Attorney Docket No.:	20742/54088
First Named Inventor:	Chia-Pei Chang
Title:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Issue Fee, Assistant Commissioner of Patents, Washington, D.C. 20231

on September 5, 2001

Rhonda S. Bailey-Reed

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

ENCLOSURES (check all that apply)

- ☒ **Fee Transmittal Form**
  - ☒ **Fee Attached**
- ☐ Amendment/Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers (for an Application)
- ☒ **Drawing(s)**
- ☐ Licensing-relating Papers
- ☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Small Entity Statement
- ☐ Request for Refund
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences

08/01

☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)

☐ Proprietary Information

☐ Status Letter

☒ **Additional Enclosure(s) (please identify below):**
Issue Fee Transmittal
Submission of Formal Drawings



Remarks:

Scott M. Lohnes
Reg. No. 45,451

Date: September 5, 2001
FWDS01 RSK 143344

OIPE JC103
SEP 10 2001
PATENT & TRADEMARK OFFICE

BARNES & THORNBURG
600 One Summit Square
Fort Wayne, Indiana 46802
(219) 423-9440

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Form: PTO/SB/21 (6-98)

Customer No.:	**23641**
Application No.:	09/442,089
Filing Date:	October 21, 1999
Group Art Unit:	2172
Batch No.:	K58
Examiner Name:	Unknown
Attorney Docket No.:	20742/54088
First Named Inventor:	Chia-Pei Chang
Title:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Issue Fee, Assistant Commissioner of Patents, Washington, D.C. 20231

on September 5, 2001

Rhonda S. Bailey-Reed

FEE TRANSMITTAL FOR FY 2001

TOTAL AMOUNT OF PAYMENT: $620.00

METHOD OF PAYMENT

1. ☒ The Commissioner is hereby authorized to charge any additional fee required under 37 CFR 1.16 and 1.17 and credit any overpayments to:

   Deposit Account Number: 02-1010
   Deposit Account Name: Barnes & Thornburg

   ☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

   ☒ Check ☐ Credit Card ☐ Money Order ☐ Other



FEE CALCULATION

1. Basic Filing Fee:

Large Fee Code	Entity Fee	Small Fee Code	Entity Fee	Fee Description	Fee Paid
101	$710.00	201	$355.00	Utility Filing Fee	
106	$320.00	206	$160.00	Design Filing Fee	
107	$490.00	207	$245.00	Plant Filing Fee	
108	$710.00	208	$355.00	Reissue Filing Fee	
114	$150.00	214	$75.00	Provisional Filing Fee	
				SUBTOTAL (1)	$0.00

2. Extra Claim Fees:

			Extra Claims		Fee from below		Fee Paid
Total Claims	_____	-20** =	_____	x	_____	=	$0.00
Independent Claims	_____	- 3** =	_____	x	_____	=	$0.00
Multiple Dependent Claim					_____	=	$0.00
					SUBTOTAL (2)		$0.00

Large Fee Code	Entity Fee	Small Fee Code	Entity Fee	Fee Description
103	$18.00	203	$9.00	Claims in excess of 20
102	$80.00	202	$40.00	Independent claims in excess of 3
104	$270.00	204	$135.00	Multiple dependent claims, if not paid
109	$80.00	209	$40.00	** Reissue independent claims over original patent
110	$18.00	210	$9.00	** Reissue claims in excess of 20 and over original patent

*** or number previously paid, if greater; For Reissues, see above*

3. Additional Fees

Large Fee Code	**Entity Fee**	**Small Fee Code**	**Entity Fee**	**Fee Description**	**Fee Paid**
105	$130.00	205	$65.00	Surcharge - late filing fee or oath	
127	$50.00	227	$25.00	Surcharge - late provisional filing fee or cover sheet	
139	$130.00	139	$130.00	Non-English specification	
147	$2,520.00	147	$2,520.00	For filing a request for *ex parte* reexamination	
112	$920.00*	112	$920.00*	Requesting publication of SIR prior to Examiner action	
113	$1,840.00*	113	$1,840.00*	Requesting publication of SIR prior to Examiner action	
115	$110.00	215	$55.00	Extension for reply within first month	
116	$390.00	216	$195.00	Extension for reply within second month	
117	$890.00	217	$445.00	Extension for reply within third month	
118	$1,390.00	218	$695.00	Extension for reply within fourth month	



Large Fee Code	Entity Fee	Small Fee Code	Entity Fee	Fee Description	Fee Paid
128	$1,890.00	228	$945.00	Extension for reply within fifth month	
119	$310.00	219	$155.00	Notice of Appeal	
120	$310.00	220	$155.00	Filing a brief in support of an appeal	
121	$270.00	221	$135.00	Request for oral hearing	
138	$1,510.00	138	$1,510.00	Petition to institute a public use proceeding	
140	$110.00	240	$55.00	Petition to revive - unavoidable	
141	$1,240.00	241	$620.00	Petition to revive - unintentional	
142	$1,240.00	**242**	**$620.00**	**Utility issue fee (or reissue)**	**$620.00**
143	$440.00	243	$220.00	Design issue fee	
144	$600.00	244	$300.00	Plant issue fee	
122	$130.00	122	$130.00	Petitions to the Commissioner	
123	$50.00	123	$50.00	Petitions related to provisional applications	
126	$180.00	126	$180.00	Submission of Information Disclosure Statement	
581	$40.00	581	$40.00	Recording each patent assignment per property (times number of properties)	
146	$710.00	246	$355.00	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	$710.00	249	$355.00	For each additional invention to be examined (37 CFR § 1.129(b))	
179	$710.00	279	$355.00	Request for Continued Examination (RCE)	
169	$900.00	169	$900.00	Request for expedited examination of a design application	
Other fee (specify): _____					
* Reduced by Basic Filing Fee Paid				**SUBTOTAL (3)**	$620.00

Scott M. Lohnes
Reg. No. 45,451

Date: September 5, 2001
FWDS01 RSK 143344

Title: System for Integrating Data Among Heterogeneous Systems
Inventor: Chia-Pei Chang
Docket #: 20742/54088
Serial #: 09/442,089
Sheet 1 of 6

6308178

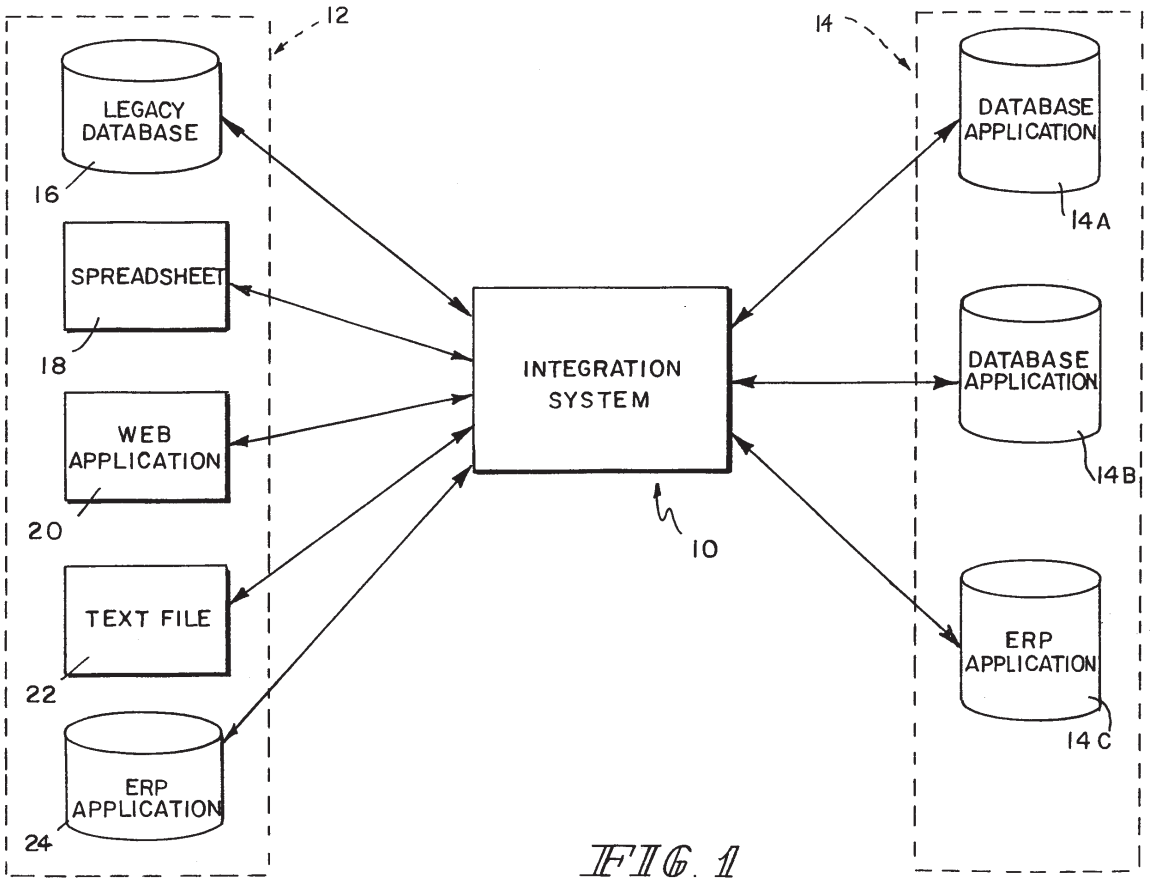


FIG. 1

Title: System for Integrating Data Among Heterogeneous Systems
Inventor: Chia-Pei Chang
Docket #: 20742/54088
Serial #: 09/442,089
Sheet 2 of 6

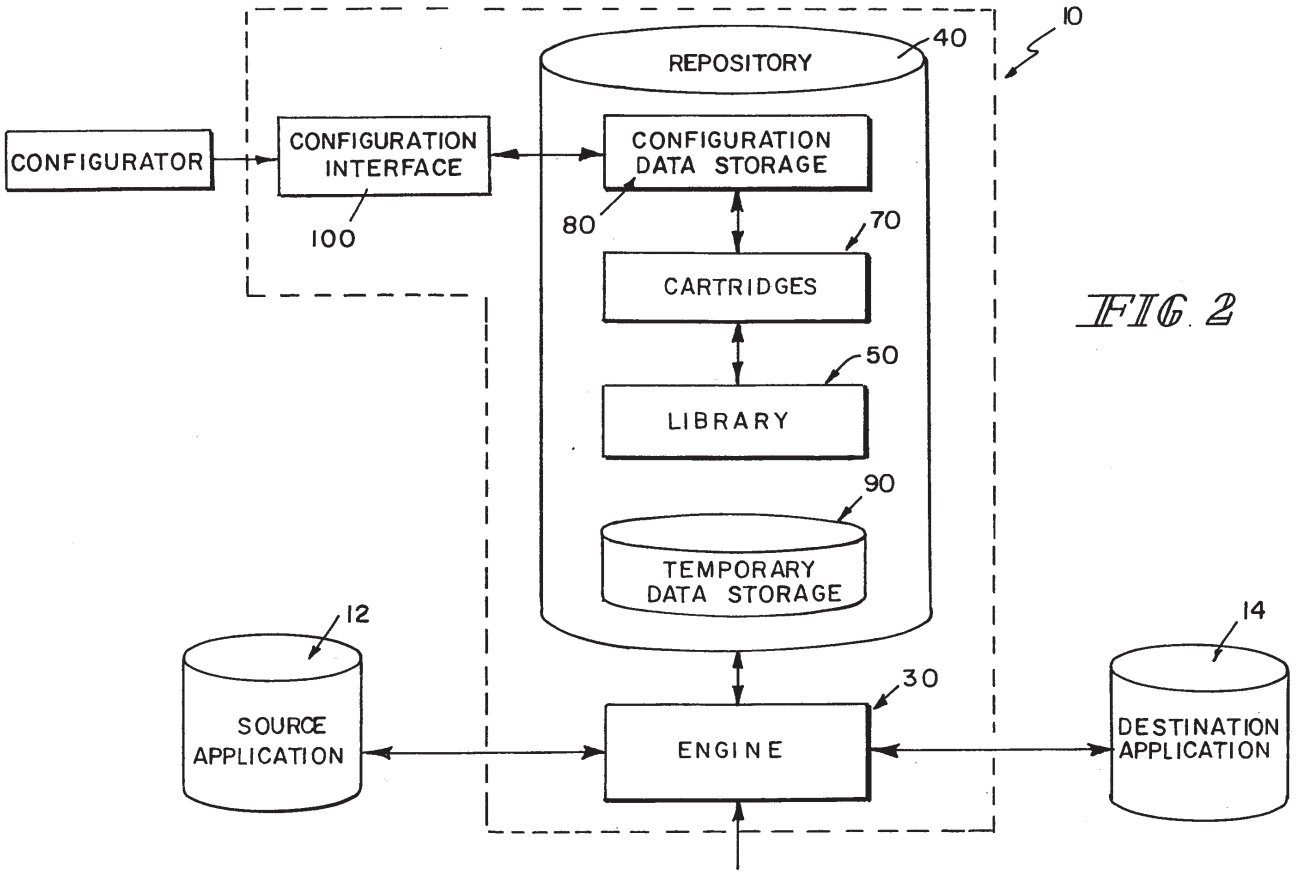


FIG. 2

Title: System for Integrating Data Among Heterogeneous Systems
Inventor: Chia-Pei Chang
Docket #: 20742/54088
Serial #: 09/442,089
Sheet 3 of 6

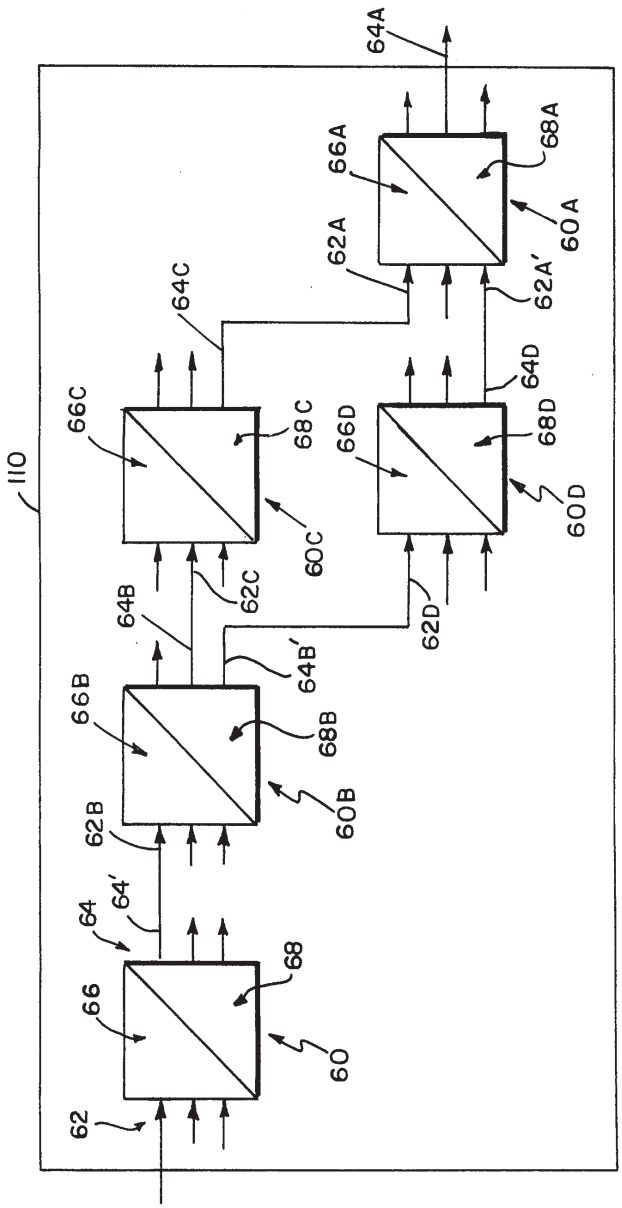


FIG. 3

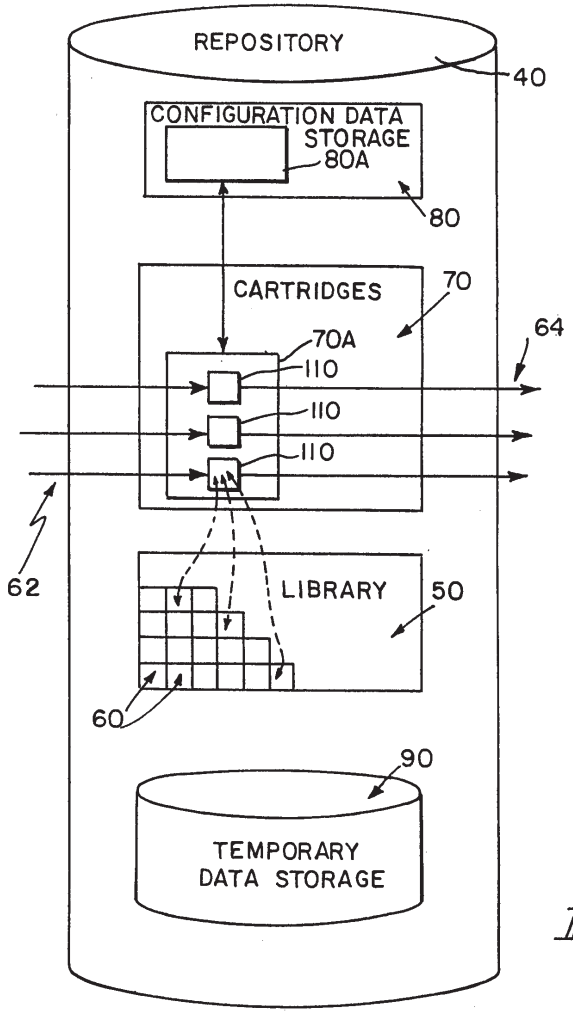

REPOSITORY
40
CONFIGURATION DATA STORAGE
80A
80
CARTRIDGES
70
70A
64
110
110
110
62
LIBRARY
50
60
90
TEMPORARY DATA STORAGE

FIG. 4

Title: System for Integrating Data Among Heterogeneous Systems
Inventor: Chia-Pei Chang
Docket #: 20742/54088
Serial #: 09/442,089
Sheet 5 of 6

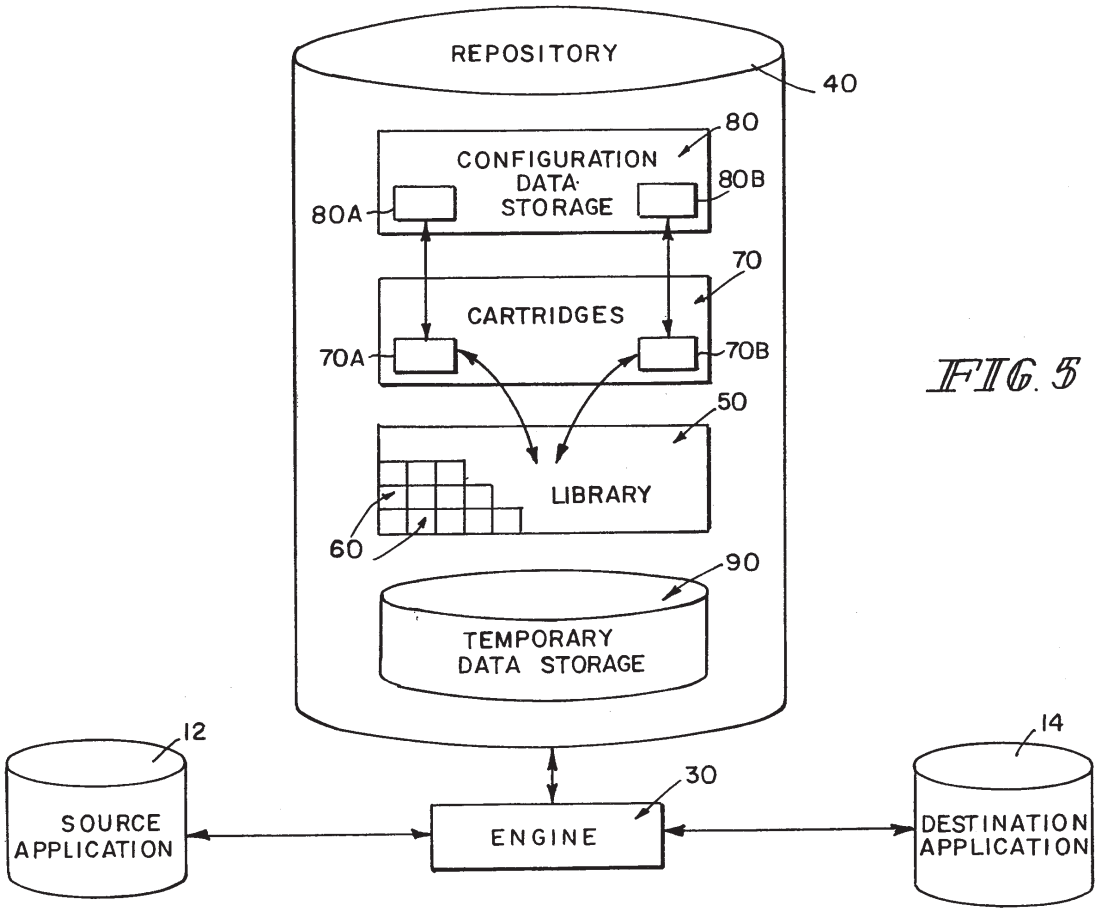


FIG. 5

Title: System for Integrating Data Among Heterogeneous Systems
Inventor: Chia-Pei Chang
Docket #: 20742/54088
Serial #: 09/442,089
Sheet 6 of 6

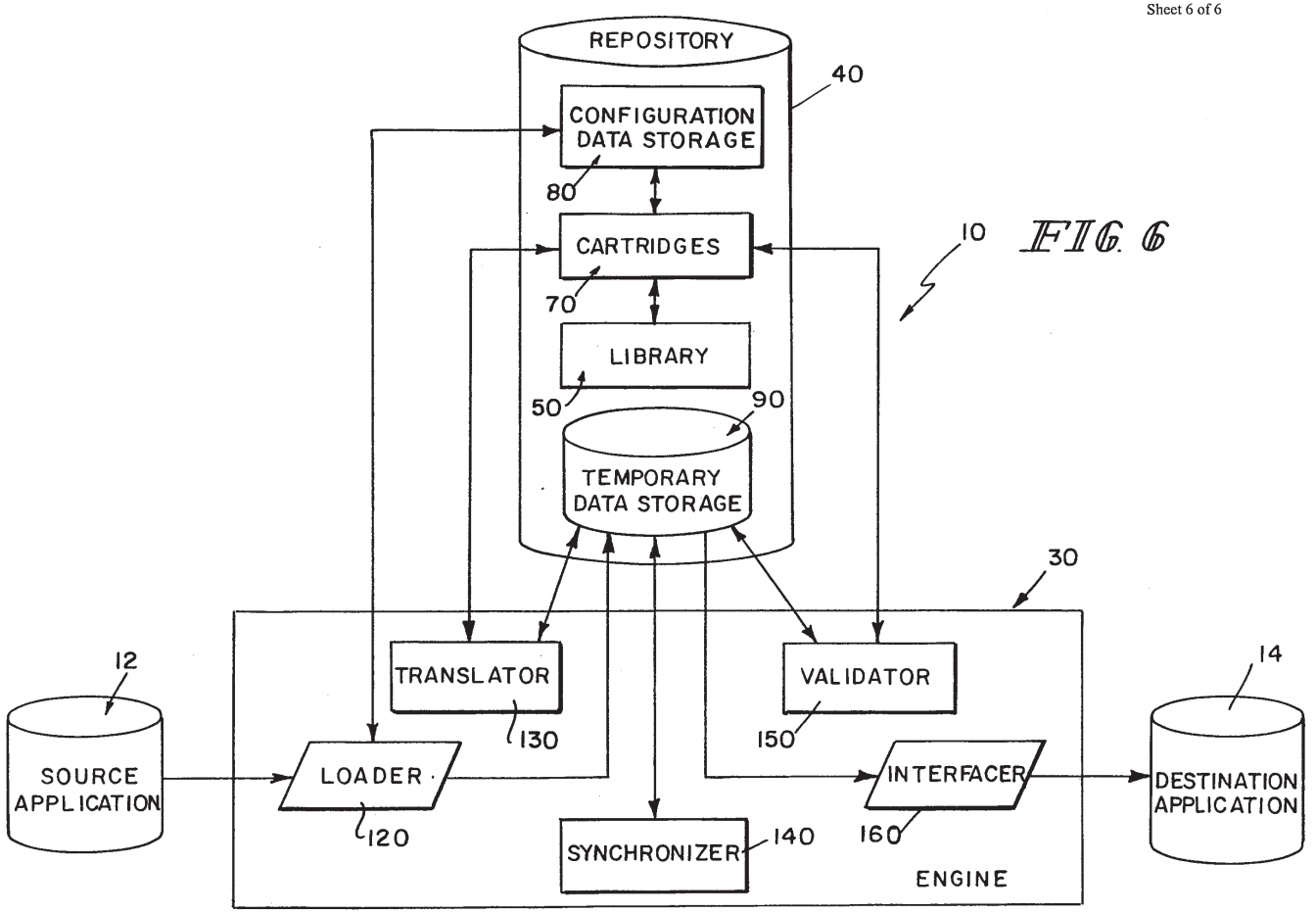


FIG. 6

OIPE
SEP 10 2001
PATENT & TRADEMARK OFFICE

ARNES & THORNBURG
600 One Summit Square
Fort Wayne, Indiana 46802
(219) 423-9440

#10

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Form: PTO/SB/21 (6-98)

Customer No.:	**23641**
Application No.:	09/442,089
Filing Date:	October 21, 1999
Group Art Unit:	2172
Batch No.:	K58
Examiner Name:	Unknown
Attorney Docket No.:	20742/54088
First Named Inventor:	Chia-Pei Chang
Title:	SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Issue Fee, Assistant Commissioner of Patents, Washington, D.C. 20231

on September 5, 2001

Rhonda S. Bailey-Reed

SUBMISSION OF FORMAL DRAWINGS

Box Issue Fee
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Formal drawings meeting the requirements of 37 CFR Section 1.84 are hereby submitted.

Please credit any overpayments or charge any additional fees to the Deposit Account of Barnes & Thornburg, Account Number 02-1010.

Respectfully submitted,

Scott M. Lohnes
Reg. No. 45,451
(219) 423-9440

SML:rbr
Enclosures
FWDS01 RSK 143344

HM

PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form, together with applicable fees, to: **Box ISSUE FEE**
Assistant Commissioner for Patents
Washington, D.C. 20231

OIPE SEP 10 2001 PATENT & TRADEMARK OFFICE

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

TM31/0814

ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND IN 46601

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

Rhonda S. Bailey-Reed (Depositor's name)

Rhonda Reed (Signature)

Sept 5, 2001 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/442,089	10/21/99	034	ALAM, S 2172	08/14/01

First Named Applicant: CHANG, — 35 USC 154(b) term ext. = 0 Days.

TITLE OF INVENTION: SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 20742/54088	707-100.000	K58	UTILITY	YES	$620.00	11/14/01

1. Change of correspondence address or indication of " Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Barnes & Thornburg
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE
Darc Corporation

(B) RESIDENCE: (CITY & STATE OR COUNTRY)
Chicago, Illinois USA

Please check the appropriate assignee category indicated below (will not be printed on the patent)
☐ Individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):
☒ Issue Fee
☐ Advance Order - # of Copies

4b. The following fees or deficiency in these fees should be charged to:
DEPOSIT ACCOUNT NUMBER 02-1010
(ENCLOSE AN EXTRA COPY OF THIS FORM)
☒ Issue Fee
☐ Advance Order - # of Copies

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature) Barb M. Dek (Date) 9/6/01

NOTE: The Issue Fee will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

09/13/2001 HVUONG2 00000026 09442089
01 FC:242 620.00 OP

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMIT THIS FORM WITH FEE

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2001-10-23

Document Title - USPTO Grant

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

DDS #5

PTO/SB/06 (8-96)
Approved for use through 9/30/98. OMB 0651-0032
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Application or Docket Number: 20742/54880

CLAIMS AS FILED - PART I

	(Column 1) NUMBER FILED		(Column 2) NUMBER EXTRA	SMALL ENTITY RATE	SMALL ENTITY FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY FEE
BASIC FEE (37 CFR 1.16(a))					$ 380	OR		$ 760
TOTAL CLAIMS (37 CFR 1.16(c))	34	minus 20 =	* 14	x $ 9 =	126	OR	x $ 18 =	0
INDEPENDENT CLAIMS (37 CFR 1.16(b))	3	minus 3 =	* 0	x 39 =	0	OR	x 78 =	0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))				+ 130 =	0	OR	+ 260 =	0
* If the difference in column 1 is less then zero, enter "0" in column 2				TOTAL	506	OR	TOTAL	760

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
Total (37 CFR 1.16(c))	*	Minus **	=	x $ =		OR	x $ =	
Independent (37 CFR 1.16(b))	*	Minus ***	=	x =		OR	x =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ =		OR	+ =	
				TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
Total (37 CFR 1.16(c))	*	Minus **	=	x $ =		OR	x $ =	
Independent (37 CFR 1.16(b))	*	Minus ***	=	x =		OR	x =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ =		OR	+ =	
				TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
Total (37 CFR 1.16(c))	*	Minus **	=	x $ =		OR	x $ =	
Independent (37 CFR 1.16(b))	*	Minus ***	=	x =		OR	x =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ =		OR	+ =	
				TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

SBDS02 RDN 187910

Small entity

PATENT APPLICATION FEE DETERMINATION RECORD
Effective November 10, 1998

Application or Docket Number

CLAIMS AS FILED - PART I

	(Column 1)		(Column 2)
FOR	NUMBER FILED		NUMBER EXTRA
BASIC FEE			
TOTAL CLAIMS	34	minus 20=	* 14
INDEPENDENT CLAIMS	3	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT			

SMALL ENTITY TYPE ☐			OTHER THAN SMALL ENTITY	
RATE	FEE	OR	RATE	FEE
	380.00	OR		760.00
X$ 9=		OR	X$18=	252
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL		OR	TOTAL	1012

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY			OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

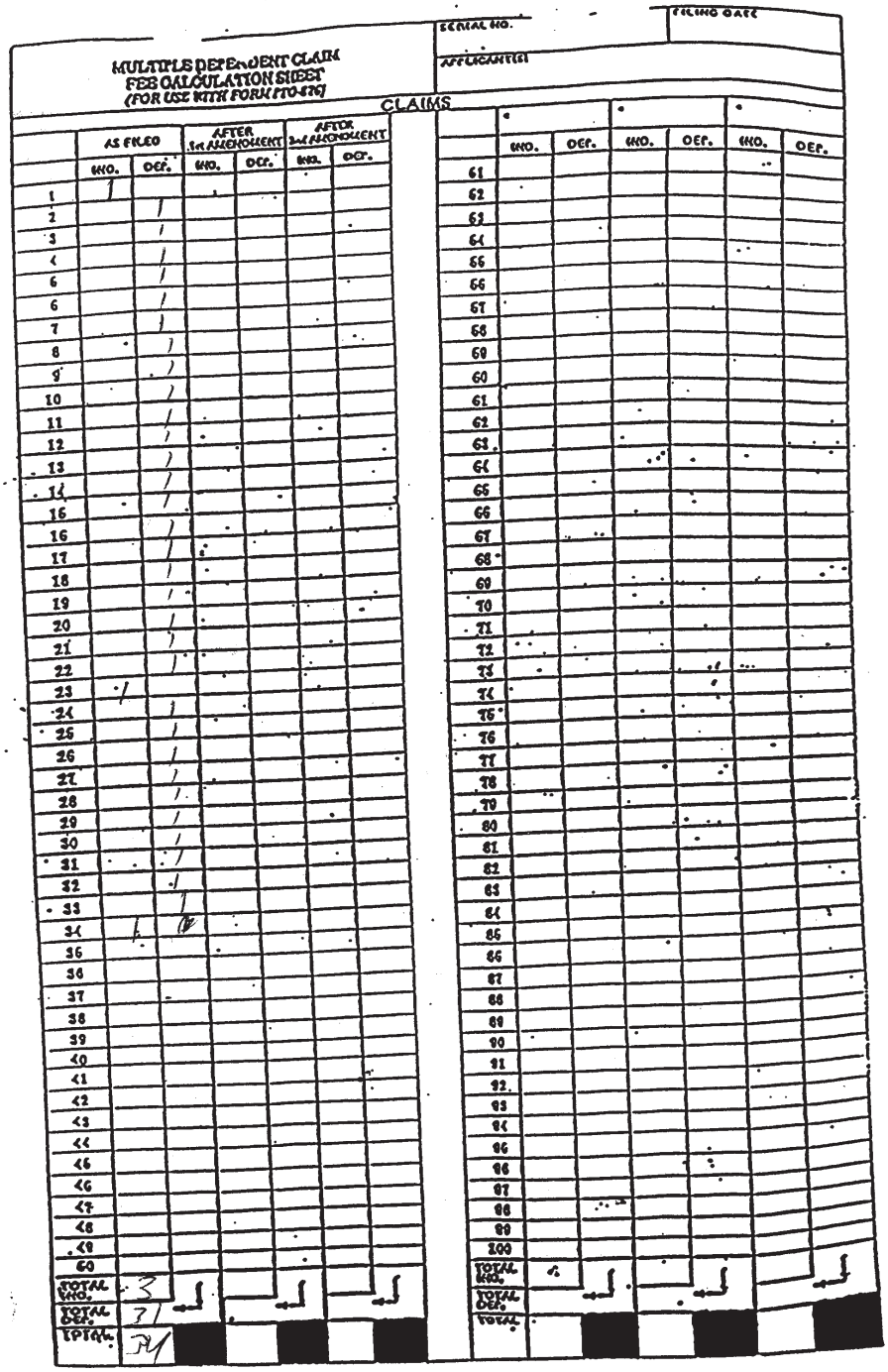
RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X39=		OR	X78=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875 (Rev. 11/98)

*U.S. Government Printing Office: 1999 — 459-072/19142

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE



MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-875)

SERIAL NO.

FILING DATE

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
TOTAL NO.	3					
TOTAL DEP.	21					
TOTAL	24					

Derwent Innovation Patent Export, 2022-04-01 00:50:00 +0000

Search results for: PNS=(US6308178);
Collections searched: DWPI; ARIPO grant; Argentina UM; Argentina app; Armenia grant; Australia UM; Australia app; Australia grant; Austria UM; Austria app; Austria grant; Belarus UM; Belarus grant; Belgium app; Belgium grant; Brazil UM; Brazil app; Brazil grant; Bulgaria UM; Bulgaria app; Bulgaria grant; Canada app; Canada grant; China, Mainland UM; China, Mainland app; China, Mainland grant; Colombia app; Costa Rica UM; Costa Rica app; Croatia UM; Croatia app; Croatia grant; Cuba app; Cuba grant; Czech Republic UM; Czech Republic app; Czech Republic grant; Czechoslovakia grant; Denmark UM; Denmark app; Denmark grant; Estonia UM; Estonia app; Estonia grant; Eurasian (EAPO) grant; Europe (EP) app; Europe (EP) grant; Finland app; Finland grant; France app; France grant; Georgia grant; German Democratic Republic app; German Democratic Republic grant; Germany UM; Germany app; Germany grant; Greece app; Greece grant; Gulf Cooperation Council grant; Hong Kong UM; Hong Kong app; Hong Kong grant; Hungary grant; Iceland grant; India app; India grant; Indonesia UM; Indonesia app; Ireland UM; Ireland app; Ireland grant; Israel grant; Italy grant; Italy grant; Italy grant; Italy grant; Japan UM; Japan app; Japan grant; Korea UM; Korea app; Korea grant; Latvia grant; Lithuania grant; Luxembourgh app; Luxembourgh grant; Malaysia app; Malaysia grant; Mexico app; Mexico grant; Moldova UM; Moldova grant; Monaco grant; Mongolia UM; Mongolia grant; Morocco app; Morocco grant; Netherlands app; Netherlands grant; New Zealand grant; Norway app; Norway grant; OAPI grant; PCT (WO) app; Philippines UM; Philippines app; Philippines grant; Poland UM; Poland grant; Portugal UM; Portugal app; Portugal grant; Romania UM; Romania app; Romania granted; Russia UM; Russia app; Russia grant; Serbia UM; Serbia app; Serbia grant; Singapore app; Singapore grant; Slovakia UM; Slovakia app; Slovakia grant; Slovenia UM; Slovenia grant; South Africa app; Spain UM; Spain app; Spain grant; Sweden app; Sweden grant; Switzerland app; Switzerland grant; Taiwan UM; Taiwan appl; Taiwan grant; Thailand UM; Thailand app; Thailand grant; Tunisia app; Turkey UM; Turkey app; Turkey grant; UK app; UK grant; USSR grant; Ukraine UM; Ukraine grant; United States app; United States grant; Uruguay app; Vietnam UM; Vietnam app; Vietnam grant; Other

Table of Contents

1. US6308178B1 System for integrating data among heterogeneous systems

Family 1/1

1 record(s) per family

Record 1/1 US6308178B1 System for integrating data among heterogeneous systems

Title: System for integrating data among heterogeneous systems

Title - DWPI: Database integration system for business enterprises, groups destination applications with processed data and processes source application data by activating relevant data elements

Priority Number: US1999442089A

Priority Date: 1999-10-21

Application Number: US1999442089A

Application Date: 1999-10-21

Publication Date:2001-10-23

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
G06F001730	G	G06	G06F	G06F0017	G06F001730

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
G06F001730 (IPC 1-7)	G	G06	G06F	G06F0017	G06F001730 (IPC 1-7)
G06F001730	G	G06	G06F	G06F0017	G06F001730

Assignee/Applicant: Darc Corporation,Chicago,IL

JP F Terms:

JP FI Codes:

Assignee - Original: Darc Corporation

Any CPC Table:

Type	Invention	Additional	Version	Office
Current	**G06F 16/258**	-	20190101	EP; US

Current Current	-	Y10S 707/99936 Y10S 707/99945	20130101 20130101	EP; US EP; US
Original	**G06F 16/258**	-	20190101	US
Original Original	-	Y10S 707/99936 Y10S 707/99945	20130101 20130101	US US

ECLA: G06F001730S5V

Abstract:

A system for integrating data among heterogeneous source applications and destination applications including a knowledge repository containing temporary data storage for storing data from the source applications during processing for population in the destination applications, a library of data elements each providing a discrete data manipulation friction, configuration data storage for storing user-provided information describing the integration environment, and a plurality of add-on modules or cartridges which each include a plurality of predefined instruction sets defining chains of data elements to perform interface functions corresponding to a particular destination application. The underlying interface communication and processing functions are performed by an active component (or engine) according to the configuration data and the module instruction sets. The active component is driven by the repository data to load source data into the temporary data storage, translate, synchronize, and validate that data, then interface the data to a destination application. A configuration interface permits the user to configure the system.

Language of Publication: EN

INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact
2022-03-01	AS	-
Description: ASSIGNMENT ISIX IP LLC, TEXAS ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:AEQUITAS TECHNOLOGIES LLC; REEL/FRAME:059132/0689 2020-08-10		
2018-01-08	AS	-
Description: ASSIGNMENT AEQUITAS TECHNOLOGIES LLC, CALIFORNIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:ISIX CORPORATION; REEL/FRAME:045022/0193 2017-12-20		
2016-03-11	AS	-
Description: ASSIGNMENT ISIX CORPORATION, ILLINOIS CHANGE OF NAME; ASSIGNOR:DARC CORPORATION; REEL/FRAME:038074/0336 2016-03-09		

2013-10-17	SULP	+
Description: SURCHARGE FOR LATE PAYMENT FEE PAYMENT YEAR 11		
2013-10-17	FPAY	+
Description: FEE PAYMENT FEE PAYMENT YEAR 12		
2013-05-31	REMI	-
Description: MAINTENANCE FEE REMINDER MAILED		
2009-04-22	FPAY	+
Description: FEE PAYMENT FEE PAYMENT YEAR 8		
2005-04-25	FPAY	+
Description: FEE PAYMENT FEE PAYMENT YEAR 4		
2001-10-04	STCF	-
Description: INFORMATION ON STATUS: PATENT GRANT PATENTED CASE		
2000-11-01	AS	-
Description: ASSIGNMENT DARC CORPORATION, ILLINOIS ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:CHANG, CHIA-PEI; CONNOLLY, BRIAN J.; BLACKLEDGE, ERIC; AND OTHERS; REEL/FRAME:011230/0614 2000-10-19		

Post-Issuance (US):

Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date
ISIX IP LLC,AUSTIN,TX,US	AEQUITAS TECHNOLOGIES LLC	2020-08-10	059132/0689	2022-03-01
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: JOSEPH NGUYEN 211 E. 7TH ST., STE 620 AUSTIN, TX 78701				
AEQUITAS TECHNOLOGIES LLC,LAGUNA BEACH,CA,US	ISIX CORPORATION	2017-12-20	045022/0193	2018-01-08
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: KIMBERLY BODE 2561 PARK AVENUE LAGUNA BEACH, CA 92651				

ISIX CORPORATION,CRYSTAL LAKE,IL,US	DARC CORPORATION	2016-03-09	038074/0336	2016-03-11
Conveyance: CHANGE OF NAME (SEE DOCUMENT FOR DETAILS).				
Corresponent: BRIAN CONNOLLY 60-B W. TERRA COTTA AVE. STE 122 CRYSTAL LAKE, IL 60014				
DARC CORPORATION,CHICAGO,IL,US	CHANG, CHIA-PEI	2000-10-19	011230/0614	2000-11-01
	CONNOLLY, BRIAN J.	2000-10-19		
	BLACKLEDGE, ERIC	2000-10-19		
	HOFFMAN, ROBERT JOHN	2000-10-19		
	HOMAN, BOB	2000-10-19		
	SCHULZ, KLAUS	2000-10-19		
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: BARNES & THORNBURG BOBBY B. GILLENWATER 600 ONE SUMMIT SQUARE FORT WAYNE, IN 46802				

Maintenance Status (US):

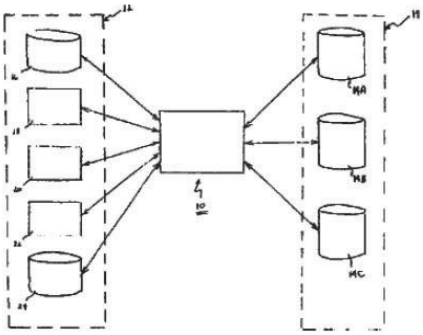
Litigation (US): 2022-03-14 2022 Isix IP LLC Boomi LP Boomi, Inc. Dell Technologies, Inc. Dell Inc. W.D. Texas 6:22cv00275 | 2022-02-25 2022 Isix IP LLC International Business Machines Corporation W.D. Texas 6:22cv00201

Opposition (EP):

License (EP):

EPO Procedural Status:

Front Page Drawing:



Priority Number - DWPI: US1999442089A
Priority Date - DWPI: 1999-10-21
Assignee - Current US: ISIX IP LLC

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Office of the Commissioner for Patents

SYSTEM FOR INTEGRATING DATA AMONG HETEROGENEOUS SYSTEMS

PATENT #	APPLICATION #	FILING DATE	ISSUE DATE
6308178	09442089	10/21/1999	10/23/2001

Payment Window Status

WINDOW	STATUS	FEES
11.5 Year	Closed	Paid

No maintenance fees are due.

Window	First Day to Pay	Surcharge Starts	Last Day to Pay	Status	Fees
3.5 Year	10/23/2004	04/26/2005	10/24/2005	Closed	Paid
7.5 Year	10/23/2008	04/24/2009	10/23/2009	Closed	Paid
11.5 Year	10/23/2012	04/24/2013	10/23/2013	Closed	Paid

Patent Holder Information

Customer #

Entity Status SMALL

Phone Number

Address
ROBERT D NULL
BARNES & THORNBURG
600 1ST SOURCE BANK CENTER
100 NORTH MICHIGAN STREET
SOUTH BEND, IN 46601
UNITED STATES