EXHIBIT 8

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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	LEADP102USA
First Inventor	Michael T. McKibben
Title	DYNAMIC ASSOCIATION OF...
Express Mail Label No.	EV330022250US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:
Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

1. [✔] Fee Transmittal Form (e.g., PTO/SB/17)
   (Submit an original and a duplicate for fee processing)
2. [✔] Applicant claims small entity status.
   See 37 CFR 1.27.
3. [✔] Specification   [Total Pages __40__]
   (preferred arrangement set forth below)
   - Descriptive title of the invention
   - Cross Reference to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to sequence listing, a table,
     or a computer program listing 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

4. [✔] Drawing(s) (35 U.S.C. 113)   [Total Sheets __18__]

5. Oath or Declaration   [Total Sheets __2__]
   a. [✔] Newly executed (original or copy)
   b. [ ] Copy from a prior application (37 CFR 1.63(d))
      (for continuation/divisional with Box 18 completed)
      i. [ ] DELETION OF INVENTOR(S)
         Signed statement attached deleting inventor(s)
         name in the prior application, see 37 CFR
         1.63(d)(2) and 1.33(b).

6. [ ] Application Data Sheet. See 37 CFR 1.76

7. [ ] CD-ROM or CD-R in duplicate, large table or
   Computer Program *(Appendix)*
8. Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, all necessary)
   a. [ ] Computer Reader Form (CRF)
   b. Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. [✔] Assignment Papers (cover sheet & document(s))
10. [ ] 37 CFR 3.73(b) Statement   [✔] Power of
    (when there is an assignee)   Attorney
11. [ ] English Translation Document *(if applicable)*
12. [ ] Information Disclosure   [ ] Copies of IDS
    Statement (IDS)/PTO-1449   Citations
13. [ ] Preliminary Amendment
14. [✔] Return Receipt Postcard (MPEP 503)
    (Should be specifically itemized)
15. [ ] Certified Copy of Priority Document(s)
    (if foreign priority is claimed)
16. [ ] Nonpublication Request under 35 U.S.C. 122
    (b)(2)(B)(i). Applicant must attach form PTO/SB/35
    or its equivalent.
17. [✔] Other: .Express.Mail.Certificate.............................
    ....

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

[ ] Continuation   [ ] Divisional   [ ] Continuation-in-part (CIP)   of prior application No.: ....

Prior application information: Examiner _____   · Art Unit: _____
For CONTINUATION OF DIVISIONAL APPS only; The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation <u>can only</u> be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. CORRESPONDENCE ADDRESS

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FEE TRANSMITTAL
for FY 2004
Effective 10/01/2003. Patent fees are subject to annual revision.

Complete if Known	
Application Number	
Filing Date	Herewith
First Named Inventor	Michael T. McKibben
Examiner Name	
Art Unit	
Attorney Docket No.	LEADP102USA

[✓] Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($) 813.00

METHOD OF PAYMENT (check all that apply)

[ ] Check [ ] Credit card [ ] Money Order [ ] Other [ ] None

[✓] Deposit Account:

Deposit Account Number	50-1063
Deposit Account Name	Amin & Turocy, LLP

The Director is authorized to: *(check all that apply)*

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	385.00
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	
				SUBTOTAL (1) ($)	385.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below	Fee Paid
Total Claims	44	-20** = 24	X 9.00 =	216.00
Independent Claims	7	- 3** = 4	X 43.00 =	172.00
Multiple Dependent			=	

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent
				SUBTOTAL (2) ($) 388.00

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

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	40.00
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($)	40.00

SUBMITTED BY (Complete *(if applicable)*)

Name (Print/Type)	Eric D. Jorgenson	Registration No. (Attorney/Agent)	46,002	Telephone	(216) 696-8730
Signature				Date	December 10, 2003

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Atty. Docket No. LEADP102USA

DYNAMIC ASSOCIATION OF ELECTRONICALLY STORED INFORMATION WITH ITERATIVE WORKFLOW CHANGES

by

Michael T. McKibben and Jeffrey R. Lamb

MAIL CERTIFICATION

I hereby certify that the attached patent application (along with any other paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on this date **December 10, 2003**, in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number **EV330022250US** addressed to the Mail Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

_____
Eric D. Jorgenson

Title: DYNAMIC ASSOCIATION OF ELECTRONICALLY STORED
INFORMATION WITH ITERATIVE WORKFLOW CHANGES

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority under 35 U.S.C. § 119(e) from U.S. Provisional
Patent application Serial No. 60/432,255 entitled "METHOD FOR DYNAMIC
ASSOCIATION OF ELECTRONICALLY STORED INFORMATION WITH
ITERATIVE WORKFLOW CHANGES", filed December 11, 2002; and is related to co-
pending U.S. Patent Application Ser. No. _____ (Atty Dkt. No. LEADP101USA)
entitled "CONTEXT INSTANTIATED APPLICATION PROTOCOL" filed on
December 10, 2003.

TECHNICAL FIELD

This invention is related to management and storage of electronic information.
More particularly, this invention relates to new structures and methods for creating
relationships between users, applications, files, and folders.

BACKGROUND OF THE INVENTION

Digital communications presently supply solutions to users in ways that are
completely divorced from their business context. A particular item of communication
provides little or no inherent understanding of how that communication furthers the
purpose and intent of the group or enterprise. In other words, an email (electronic mail)
inbox collects email messages about all topics, both business and personal. The email
application itself is not discerning about topic, priority, or context beyond perhaps
rudimentary "message filters" that will look for certain key words or people, and then
place those items in target folders. Generally, the application simply presents a
sequential list of messages received. Similarly, a fax machine receives fax pages in
sequence. The fax machine is not discerning about topic, priority, or context, and simply
outputs fax pages. Once received, it remains the task of the recipient to sort, categorize,
and organize these items of communication in ways most meaningful to that person. The

organization part of the task generally occurs outside the context of the particular communications tool itself.

Typical methods for organization of communications are limited and fragmented. For example, for an email, the recipient may either leave all the email in the inbox or move it to another electronic folder. For a fax, the recipient is likely to place that received fax in a file folder that is identified by project name or name of recipient. These typical methods of organizing communications are wholly inadequate for a number of reasons. The recipient must do all the work of organization and categorization of the communications rather than the system itself do that work. Automation of the organization of communications is non-existent. The linkage between business strategy and an individual act of communication, a leadership priority, is non-existent. With respect to categorization, the items themselves rarely apply to only one topic of interest. As such, under current systems, the items would need to be manually stored in multiple locations (either electronic or "brick and mortar" folders). For example, a letter faxed to a sales manager may contain information about contact addresses, market intelligence data, specific product requests, and financial accounting.

Data items often relate to organizational issues for which one or more work groups need access; access that is denied when the recipient "buries" that item in his/her personal filing system, electronic or otherwise. Thus, the sharing of knowledge in this context is prohibitive.

Prior art communications tools do not know the business and/or personal context(s) within which files are created and used. For example, a person may create three files in a word processor, one relating to sales, the second relating to operations, and the third relating to a son's football team. However, the word processor itself has no way of knowing to automatically store those three files in at least three different places. Insofar as security and privacy are concerned, the applications and associated file storage methods are generally insecure, not conforming to a single, dependable security model.

Known software applications create and store files outside of a contextual framework. For example, when a user creates a word processing file using a conventional word processor application, the user typically must select a single folder within which to store that file. The file may be stored in an existing folder or the user

may create a new folder to receive the file. This file management method is known as Lightweight Directory Application Protocol (LDAP). LDAP borrowed the physical world paper file management scheme where a machine/application creates files, stores those files in individual folders, and stores those folders in cabinets. Under this scheme,

5   context is completely independent of the application. File context is limited to the decision made by the user about the folder in which the file should be stored. The user decision does not adequately represent or reflect the true context of the file given that the file may contain information that could reasonable be stored in multiple folders.

LDAP systems are suited for smaller one-to-many and many-to-one relationships.

10   For example, an e-mail message to ten recipients is a one-to-many relationship, while ten customers sending orders to a single vendor exemplifies a many-to-one relationship. In the case of the former, the e-mail is stored in an Outbox, and the ten recipients store the received message in their respective folders, called an Inbox. In the latter case, the ten received orders are placed in an Orders folder for the associated the product.

15   Conventional systems are designed to allow multiple users to access the same file for collaboration purposes; however, this feature does not change the basic one-to-many and many-to-one storage paradigm. Conventional systems only attempt to optimize it.

Another limitation of LDAP is that little or no information is contained within the file about the user and, the context and circumstances of the user at the time the file was

20   created. The people elements of an organization are simply too multi-dimensional for the limitations of conventional systems. Current processes designed to add context to files, such as a metadata tagging approach, involve having a knowledge officer view files after they have been stored and create metadata tags with additional key words associated with the file for search purposes.

25   The best that existing technology has done is to respond to niche requirements where automation made sense: telephone switching, voice mail, e-mail, file transfer, paging, and file storage, for example. The trend is toward a convergence of the technologies, but convergence becomes an enormous problem with these legacy systems that are now encumbered by outdated data handling and storage models that are

30   mainframe and/or hierarchical in nature.

Notwithstanding the usefulness of the above-described methods, a need still exists for a communications tool that associates files generated by applications with individuals, groups, and topical context automatically.

5 SUMMARY OF THE INVENTION

The following presents a simplified summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some

10 concepts of the invention in a simplified form as a prelude to the more detailed description that is presented later.

The present invention disclosed and claimed herein, in one aspect thereof, is a data management tool that is a unified, horizontal system for communications, organization, information processing, and data storage. The tool installs on existing

15 platforms, and is a common workflow layer that is automated with a scalable, relational database. The tool includes a relational database engine that facilitates many-to-many relationships among data elements, in addition to, one-to-many and many-to-many relationships.

The data management tool includes a novel architecture where the highest

20 contextual assumption is that there exists an entity that consists of one or more users. The data storage model first assumes that files are associated with the user. Thus, data generated by applications is associated with an individual, group of individuals, and topical content, and not simply with a folder, as in traditional systems.

When a user logs in to the system that employs the tool, the user enters into a

25 personal workspace environment. This workspace is called a board, and is associated with a user context. From within this board, the tool makes accessible to the user a suite of applications for creating and manipulating data. Any user operating within any board has access to the suite of applications associated with that board, and can obtain access to any data in any form (e.g., documents and files) created by the applications and to which

30 he or she has permission. Moreover, thereafter, the user can then move to shared workspaces (or boards), and access the same data or other data.

Data created within the board is immediately associated with the user, the user's permission level, the current workspace, any other desired workspace that the user designates, and the application. This association is captured in a form of metadata and tagged to the data being created. The metadata automatically captures the context in

5   which the data was created as the data is being created. Additionally, the data content is indexed to facilitate searching for the content in number of different ways in the future by the user or other users. This tagging process is universal, in that, the data model allows for any binary data (e.g., files), as well as any set of definable data to be accepted into the system. The system is not restricted to processing e-mail, faxes, calendar events,

10   meetings, phone calls, etc., that are included in the bundled system, but can also accommodate whatever data the user chooses to use. The system is also universal insofar as its user interaction can be through a browser that is pervasively employed for use with conventional operating systems.

In that the tool supports multiple users, there can be multiple boards. Two or

15   more boards (or workspace environments) can be grouped as a collection of boards, also called a web. Boards can exist in any number of different webs. The association of webs and boards is stored in a table. As a user creates a context, or moves from one context to at least one other context, the data created and applications used previously by the user automatically follows the user to the next context. The change in user context is captured

20   dynamically. All files and groups of files can be associated with any other file in the system, allowing a system user the flexibility in determining dynamic associations.

In addition to the macro view provided by webs and boards, the user can also create the more familiar hierarchical folders within any board. These are virtual folders, and nothing is physically stored in these folders.

25   In another aspect of the present invention, the tool provides the seamless facilitation, collection, compilation, and distribution of data.

In yet another aspect of the present invention, the tool provides links to enterprise leadership priorities.

In still another aspect of the present invention, the tool performs communications

30   tasks while simultaneously reminding the user of his/her individual work priorities.

In another aspect thereof, the tool provides automatically stores contextual information relating to an item of communication and utilizes that contextual information in performance of communication tasks.

In yet another aspect thereof, the tool integrates two or more different applications

5   such as telephony, unified messaging, decision support, document management, portals, chat, collaboration, search, vote, relationship management, calendar, personal information management, profiling, directory management, executive information systems, dashboards, cockpits, tasking, meeting, conferencing, etc., into a common application.

10   In another aspect thereof, the tool provides a structure for defining relationships between complex collections of data.

In still another aspect of the present invention, the tool provides a process for automating workflow between multiple entities.

To the accomplishment of the foregoing and related ends, certain illustrative

15   aspects of the invention are described herein in connection with the following description and the annexed drawings. These aspects are indicative, however, of but a few of the various ways in which the principles of the invention may be employed and the present invention is intended to include all such aspects and their equivalents. Other advantages and novel features of the invention may become apparent from the following detailed

20   description of the invention when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a block diagram of a system that facilitates the management of data in accordance with the present invention.

25   FIG. 2 illustrates a flow chart of a process of the present invention.

FIG. 3 illustrates a system employing a board and a web in accordance with the present invention.

FIG. 4A illustrates a diagram of board relationships.

FIG. 4B illustrates board/web relationship diagram.

30   FIG. 5 illustrates a flow chart of a process for board and web generation in accordance with the present invention.

FIG. 6 illustrates a sample webs-and-boards table used in accordance with the present invention.

FIG. 7 illustrates a block diagram of system in accordance with the present invention.

5   FIG. 8 illustrates a more detailed block diagram of a system of the present invention.

FIG. 9 illustrates a diagram of a general structure of the management tool system.

FIG. 10 illustrates a level flow diagram of the hierarchy of the present invention for associating one or more users, context, applications, and folders with data.

10   FIG. 11 illustrates a system operational in accordance with the present invention.

FIG. 12 illustrates a design integration chart of the disclosed invention.

FIG. 13 illustrates one implementation of a platform system accordance with the present invention.

FIG. 14 illustrates a general system configuration of the present invention.

15   FIG. 15 illustrates a screenshot of a management tool window of a browser used as a user interface to facilitate user interaction with meeting information in accordance with the present invention.

FIG. 16 illustrates a screenshot of a management tool window of a browser used as a user interface to facilitate user interaction with e-mail information in accordance

20   with the present invention.

FIG. 17 illustrates a screenshot of a management tool window of a browser used as a user interface to facilitate user interaction with a board management option in accordance with the present invention.

FIG. 18 illustrates a screenshot of a management tool window of a browser used

25   as a user interface to facilitate user interaction with a phone option in accordance with the present invention.

FIG. 19 illustrates a screenshot of a management tool window of a browser used as a user interface to facilitate user interaction with a files option in accordance with the present invention.

FIG. 20 illustrates a screenshot of a management tool window of a browser used as a user interface to facilitate user interaction with a user context in accordance with the present invention.

FIG. 21 illustrates a block diagram of a computer operable to execute the disclosed architecture.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is now described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It may be evident, however, that the present invention may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to facilitate describing the present invention.

As used in this application, the terms "component" and "system" are intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a server and the server can be a component. One or more components may reside within a process and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers.

As used herein, the term "inference" refers generally to the process of reasoning about or inferring states of the system, environment, and/or user from a set of observations as captured *via* events and/or data. Inference can be employed to identify a specific context or action, or can generate a probability distribution over states, for example. The inference can be probabilistic–that is, the computation of a probability distribution over states of interest based on a consideration of data and events. Inference can also refer to techniques employed for composing higher-level events from a set of events and/or data. Such inference results in the construction of new events or actions from a set of observed events and/or stored event data, whether or not the events are

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correlated in close temporal proximity, and whether the events and data come from one or several event and data sources.

Referring now to FIG. 1, there is illustrated a block diagram of a system 100 that facilitates the management of data in accordance with the present invention. The data

5 management tool includes a novel architecture where the highest contextual assumption is that there exists an entity that consists of one or more users. The data management and storage model first assumes that data is associated with the user. Thus, data generated by an application employed by the user is associated with the user, groups of users, and topical content; and not simply with a folder, as in traditional systems.

10 In support thereof, when a user logs-in to the system 100, user data 102 is generated and associated with at least the user and the login process. The user automatically enters into a user workspace or a first context 104 (also denoted CONTEXT$_1$) or environment. This environment can be a default user workspace, or workspace environment predesignated by the user or an administrator after login, for

15 example. After login, the user can perform data operations (e.g., create and manipulate) on a data 106 in any number of ways, including, but not limited to, viewing, editing, copying, moving, and deleting the data. Such data operations can be performed using at least one application 108. For example, where the data 106 is text data, a text editing or word processing application can be employed. Many different text editor and/or word

20 processing applications exist that can be used to create, view, edit, copy, and move the data 106, to name just a few of the operations. Where the data 106 is program code, the application 108 is one that is suitable for providing user access and interaction therewith. Where the data 106 is a voice file, the application 108 can be an application suitable for playing the voice file. This all occurs in association with the first context 104.

25 The system 100 also includes a context component 110 in association with the first context 104 to monitor and generate context data 112 associated with data operations of the user in the first context 104. The context data 112 includes at least data representative of the user (e.g., some or all of the user data 102), data representative of the first context 104, data representative of the data 106, and data representative of the

30 application 108. The context data 112 can be stored in the form of a table (or any other suitable data structure) for access and processing, and at any location, as desired.

The system 100 can include a plurality of the contexts, denoted as $CONTEXT_1,...,CONTEXT_N$. Thus, in addition to the first context 104, there is at least a second context 114 with which the context component 110 is associated. This is because the user of the first context 104 can move to the second context 114, and perform many

5 different data operations therein which will then be associated with that user in that second context 114. The data operations performed in the second context 114 are also associated with the user and stored automatically. Such user activities and data operations in the one or more contexts of the system 100 and movement of the user between contexts are tracked using a tracking component 116. Thus, data generated by

10 applications is associated with an individual, group of individuals, and topical content; and not simply with a folder, as in traditional systems.

Referring now to FIG. 2, there is illustrated a flow chart of a process of the present invention. While, for purposes of simplicity of explanation, the one or more methodologies shown herein, e.g., in the form of a flow chart, are shown and described as

15 a series of acts, it is to be understood and appreciated that the present invention is not limited by the order of acts, as some acts may, in accordance with the present invention, occur in a different order and/or concurrently with other acts from that shown and described herein. For example, those skilled in the art will understand and appreciate that a methodology could alternatively be represented as a series of interrelated states or

20 events, such as in a state diagram. Moreover, not all illustrated acts may be required to implement a methodology in accordance with the present invention.

At 200, a user associated with a first context. This can occur by the user logging in to a system and automatically entering a user workspace, which workspace is associated with the first context. At 202, the user assigns applications for use in the user

25 context. This can occur explicitly by the user manually selecting the application(s) for association with the context, or implicitly by the user launching an application performing data operations within the context. At 204, the user performs a data operation. At 206, the user changes context from the first context to a second context. At 208, the data and application(s) are then automatically associates with the second context.

30 The process then reaches a Stop block.

As the user performs data operations in the first and second contexts, the system automatically creates and updates context data, as indicated at 210. This occurs transparently to the user, as indicated by the dashed line.

Referring now to FIG. 3, there is illustrated a system 300 employing a board 302 and a web 304 in accordance with the present invention. In the past, intuitive, dynamic, and changeable workflow processes have proved to be too dynamic and expensive for automation. Boards and webs are used to automate workflow processes and define relationships between data and applications. As users create and change their contexts, the data (e.g., files) and applications automatically follow, the shifts in context being captured dynamically in the context data. As used herein, a "board" is defined as a collection of data and application functionality related to a user-defined topic. For example, a user-defined topic may be a department of a company or a project that involves the company. In the case of a project, the board preferably includes all of the data relating to that project including email, tasks, calendar events, ideas, discussions, meetings, phone calls, files, contact records, people, etc. Data and applications may be grouped in a board based on the identity of the tag. As used herein, the term "web" refers to a collection of interrelated boards.

As implemented, the web 304 of the system 300 can include a plurality 306 of the boards 302 (also denoted as $BOARD_1$, $BOARD_2$,...,$BOARD_N$). The plurality of boards 306 can each be associated with a single user, one with a single user, and others with multiples users, including or not including the user. The system 300 can also employ a plurality of webs 308 (also denoted WEB_1, WEB_2,...,WEB_X). The many boards 306 can be grouped in different combinations as webs. For example, $BOARD_1$ and $BOARD_2$ can be grouped as WEB_2. Thus, where WEB_1 includes three boards all related to a single project, the boards 306 can include finance, accounting, and resources, for example.

Referring now to FIG. 4A, there is illustrated a diagram 400 of board relationships. Boards in a web may have, for example, a parent-child relationship, although this is not required. A given board can have more than one parent and more than one child. A board cannot be its own child or its own parent. However, boards can have various relationships to each other. For example, a board may be part of a circular relationship of any complexity. Illustrated herein, a first board, $BOARD_1$, is parent to a

second board, BOARD$_2$. The second board, BOARD$_2$, is parent to a third board, BOARD$_3$, and BOARD$_3$ is parent to the first board, BOARD$_1$.

Referring now to FIG. 4B, there is illustrated board/web relationship diagram 402. Boards can exist in any number of webs. Many boards will exist in more than one web.

5 The web represents a certain view of the relationships among boards. That is, the view can be hierarchical, or the view can be in the form of a work-flow. Additionally, the relationship between two boards on one web is independent of the relationship between those same two boards on other webs. As shown, in a first web, WEB$_1$, BOARD$_1$ is a parent to BOARD$_2$. Yet, in a second web, WEB$_2$, BOARD$_1$ is a child to BOARD$_2$. In a

10 third web, WEB$_3$, BOARD$_1$ and BOARD$_2$ have no relationship, but exist independent of one another. In a fourth web, WEB$_4$, BOARD$_1$ exists, but BOARD$_2$ does not. These are but a few examples of the web/board relationships that can exist in accordance with the present invention.

In accordance with the invention, webs may be used to maintain the location of

15 content within a complex and changing set of boards and support automation of a workflow process. One example of automation of a changing workflow process can be illustrated where the workflow process to be automated initially is represented by $A \rightarrow B \rightarrow C$, and ultimately changed to $A \rightarrow B/C \rightarrow D$. Three different groups of people are assigned to each item, where the resulting distribution is $A(1,2,3) + B(4,5,6) + C(7,8,9)$.

20 In the known LDAP environment, it is necessary for the automation sequence to predetermine how work data flows from A to B and C. Then the automation module for inputs to D must be spelled out and rewritten to consolidate the split inputs from B and C. As such, the automation support for this workflow change will always lag behind the ability of the people involved to start working with the new workflow assumptions.

25 In contrast, and in accordance with the present invention, webs and boards are the context for applications, files, and folders. Hence, the workflow process may be readily reorganized by making a change to one or more of the webs and boards. By simply adding the board D and rearranging some of the relationships of A, B, and C, the workflow is quickly reorganized and implemented.

30 The disclosed system has associated therewith a routing algorithm, referred to herein as a "webslice." A webslice is a relationship rule that defines a relationship

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between a web and one or more boards of that web. If the web changes (e.g., a board is added), and meets the criteria of the rule, the content will be on the new board as well. For example, the rule can include a web ID, a starting board ID, and "transversal" data (i.e., the relationship rule), in the following format:

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webslice (target board) = <webID; starting board ID; transversal data>.

Thus, if a system includes two webs, W1 and W2, where web W1 includes five boards: A (the starting board), B, C, D, and E, with each subsequent board a child to the

10 previous board (i.e., B is child of A, C is child of B, etc.), the webslice data "slicing" to board E will be similar to the following:

webslice (board E) = <W1; board A; A→B→C→D→E>.

15 It is to be appreciated that where a child board has at least two parent boards, the webslice data can include at least two paths. For example, consider that A is the parent to both B and C, with B and C the parents to D. A webslice to D can be obtained in one of two ways:

20 webslice (board D) = <W1; board A; A→B→D>, or
webslice (board D) = <W1; board A; A→C→D>.

Moreover, since the webslice to a given board of a web can take at least two different paths, one path can be longer than the other to the desired board. Consider that

25 A is the parent to both B and C, with B the parent to D, and C the parent to E, and E the parent to D. A webslice to D can be obtained in one of two ways:

webslice (board D) = <W1; board A; A→B→D>, or
webslice (board D) = <W1; board A; A→C→E→D>.

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These examples are only but a few of the relationships that can be extracted using a webslice. The webslice can also take the forms of the following: "Just the board I started from" (a default); "All child boards"; "All sibling boards"; and, "All descendant boards", for example.

5   Thus, by using at least these three basic entities for the webslice (i.e., the web ID, the starting board ID, and the transversal data), the boards associated with a given content can be ascertained. Since content is associated with context, and the board is used in part to define the context, the system knows the content associations whereupon a change of web structure, the system knows with which board(s) the content is associated, both

10   before and after the structure change. In keeping with one aspect of the invention, the location of the content may be determined dynamically at runtime using the webslice. Alternatively, the associated location of content may be determined by detecting changes in structure, detecting the temporary location of the content on the boards in the routing algorithm before and after the change, and adjusting the location of the affected content

15   as part of the change in structure. Of course, the webslice data is not limited to the three aspects indicated hereinabove, but may include further information, such as at least one application ID and user ID (that uniquely identifies the creator of the content), for example.

Data created while the user is in the board is immediately associated with the

20   user, the current workspace, any other desired workspace that the user designates, and the application. This association is captured in a form of metadata and tagged to the data being created. The metadata automatically captures the context in which the data was created as the data is being created. Additionally, the data content is indexed to facilitate searching for the content in number of different ways in the future by the user or other

25   users. This tagging process is universal, in that, the data model allows for any binary data (e.g., files), as well as any set of definable data to be accepted into the system. The system is not restricted to processing e-mail, faxes, calendar events, meetings, phone calls, etc., that are included in the bundled system, but can also accommodate whatever data the user chooses to define. The system is also universal insofar as it user interaction

30   can be through a browser that is pervasively employed for use with conventional operating systems.

Referring now to FIG. 5, there is illustrated a flow chart of a process for board and web generation in accordance with the present invention. At 500, a webs-and-boards table is created to track the relationship of said aspects. At 502, a user creates a board. This can be via an administrator initially configuring a person user workspace, or

5   thereafter, a user creating another workspace, for example, a shared workspace. At 504, the user performs data operations while in the board. The data and applications employed to operate on the data are then included as content associated with the user in this particular context. Given that there can be multiple users, there can be a corresponding one or more webs associated with the one or more users. A BOARD(S)

10   column lists the number of boards, select numbers of the boards can now be grouped in collections or webs, as indicated at 506, to facilitate workflow, for example. For any number of reasons, the web and board relationships can be changed, as indicated at 508. At 510, the webs-and-boards table is automatically updated as these changes occur. The process then reaches a Stop block.

15   Referring now to FIG. 6, there is illustrated a sample webs-and-boards table 600 used in accordance with the present invention. The table 600 includes a user information column related to a number of users (1-3 and 6-8), under the heading of USER(S). This is because the novel invention first begins by associating all aspects with the user. The table 600 also includes a WEB(S) column that associates one or more webs (W1, W2,

20   and W3) with the one or more users. A BOARD(S) column lists the lists the boards (e.g., B11, B12, and B14) with a given web. Here the users 1, 2 and 3 are associated with a web W1 that comprises a collection boards B11, B12, and B14 (where the first digit is the associated web number, and the second digit is the board number). The table 600 also includes a parent/child relationships column (denoted as BOARD(S) P/C RELATION).

25   Here, board B11 is the parent, and board B12 is a child, and a parent to board B14. The table 600 is not limited to the columns provided, but can include more information, as desired.

Referring now to FIG. 7, there is illustrated a block diagram of system 700 in accordance with the present invention. Generally, the system 700 includes an internal

30   network 702 on which is disposed a services system 704 and one or more users 706 seeking use of the services system 704. The services system 704 further includes a

services component 708 and an associated data storage system 710 for storing data and programs. The services system 704 includes the data management tool of the present invention.

A user at one of the user nodes 706 can access the services system 704 via a

5   browser over a wired/wireless communication link. Given that a browser is a principal means for access, the user node can be any type of computing device and operating system that supports a browser, whether the browser is a full-blown program typically used on a desktop computing system, or a modified or slimmed down browser interface employed in a portable computing device, e.g., a personal data assistant (PDA), wireless

10   computing tablet, and cellular/digital telephone. As illustrated, the user nodes 706 also have direct access to the data storage system 710.

The user nodes 706 can also access a global communications network 712, e.g., the Internet, using conventional communication means, thereby providing a second path for accessing the services system 704, that further facilitates direct access to the services

15   708 and/or the storage system 710. This second path is most important, since a user can access the system 704 from essentially anywhere.

The services system 704 can be utilized internal to a corporate environment operating on, for example, an intranet, and providing such services only to corporate users. In another implementation, the system 704 can be disposed external to the

20   corporate environment such that the company subscribes to the system services via a vendor.

Referring now to FIG. 8, there is illustrated a more detailed block diagram of a system 800 of the present invention. The system 800 includes the internal network 702 on which is disposed the services system 704 and the one or more users 706 seeking use

25   of the services 708 provided thereby. The services 708 facilitate the use of the data management tool, which employs one or more webs 802 and boards 804. The tool further provides portal services 806 for accessing the services from various internal and external network locations using the TCP/IP suite of protocols. Other services provided include, but are not limited to voice services 808 and outside services 810. Outside

30   services 810 facilitate including non-employees and the use of third-party applications in specific projects in the system by providing various levels of access to any number of

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