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(54) **CONTENT REPLACEMENT IN ELECTRONICALLY-PROVIDED ARCHIVED MATERIAL**

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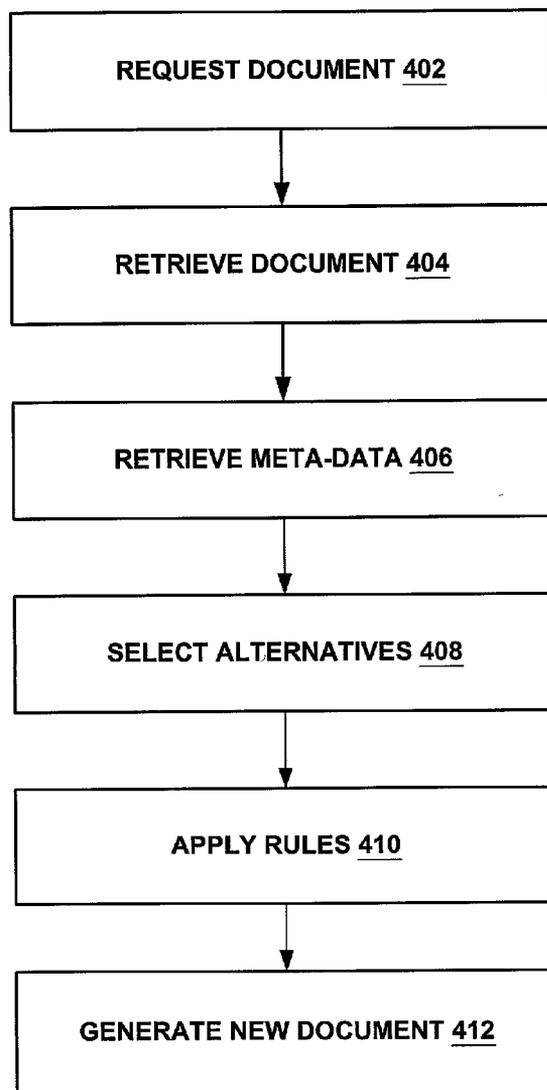
(57) **ABSTRACT**

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A document, publication or a portion of a publication containing collateral information (e.g. advertisements) is delivered in electronic form, preferably appearing electronically as it appears in traditional printed form. Collateral information associated with the document, publication or portion of the publication is dynamically replaced, enabling the user to potentially receive more useful and relevant information and enabling the publisher to potentially generate new revenue from the replaced collateral information.

(73) Assignee: **Microsoft Corporation**

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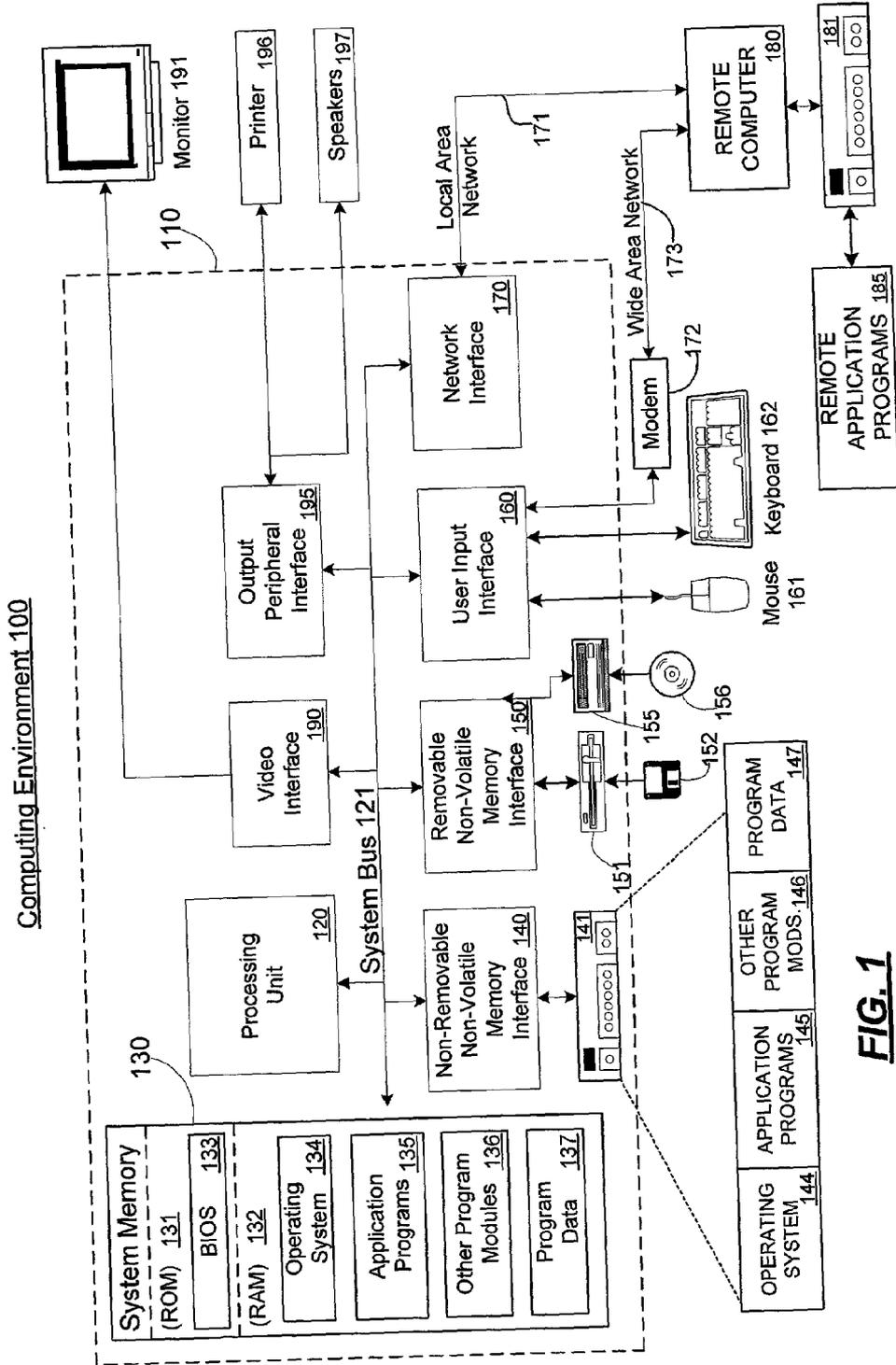


FIG. 1

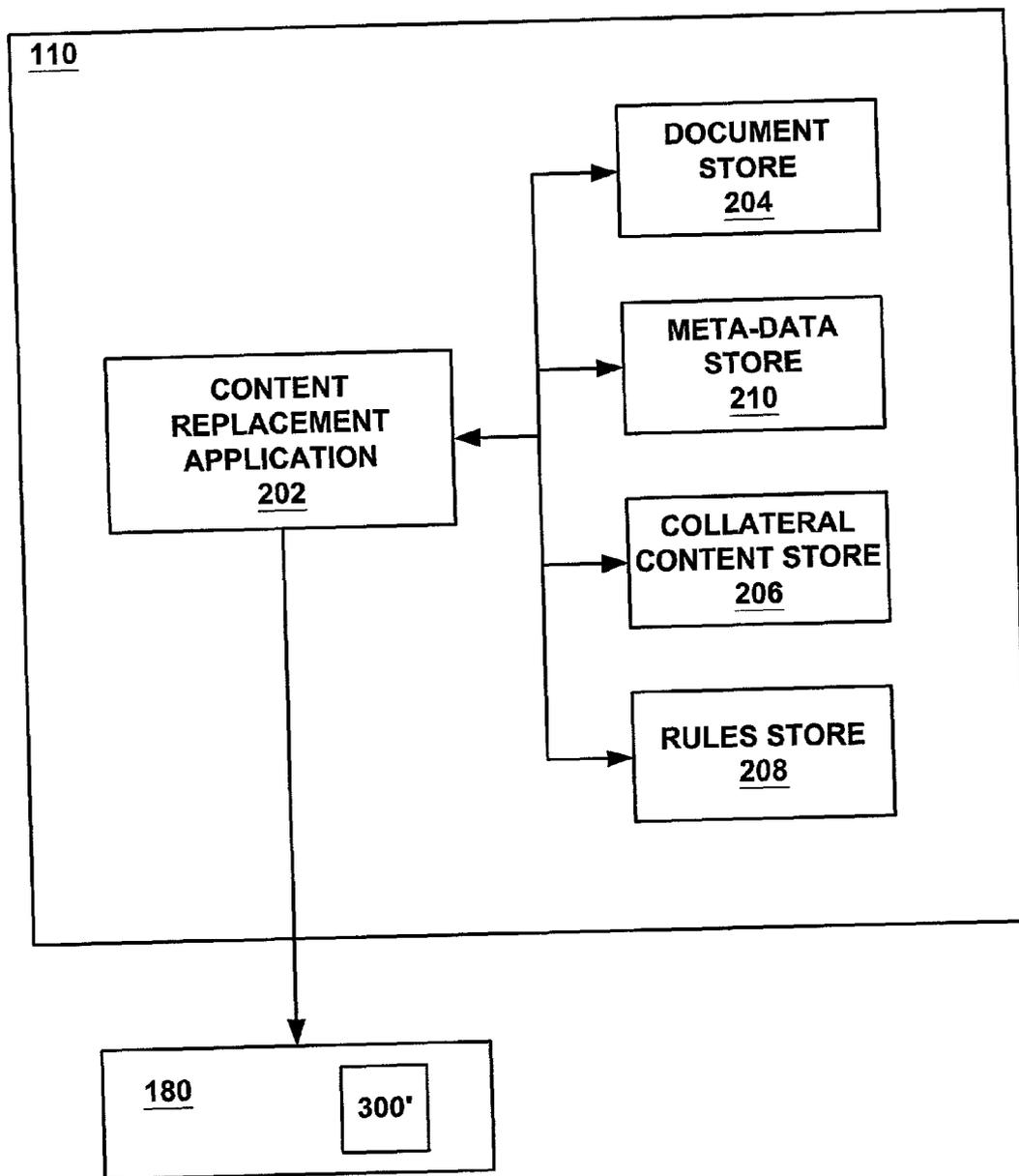


FIG. 2

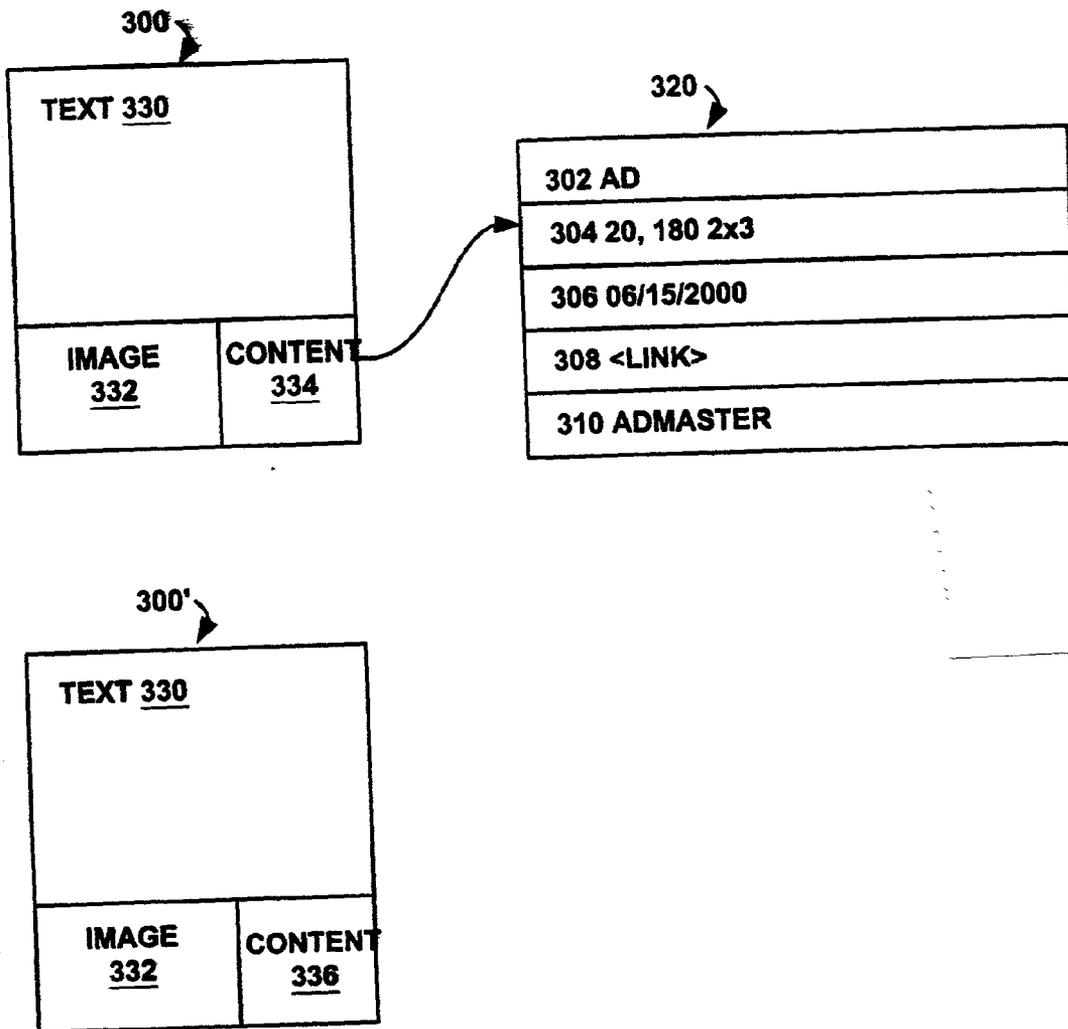


FIG. 3

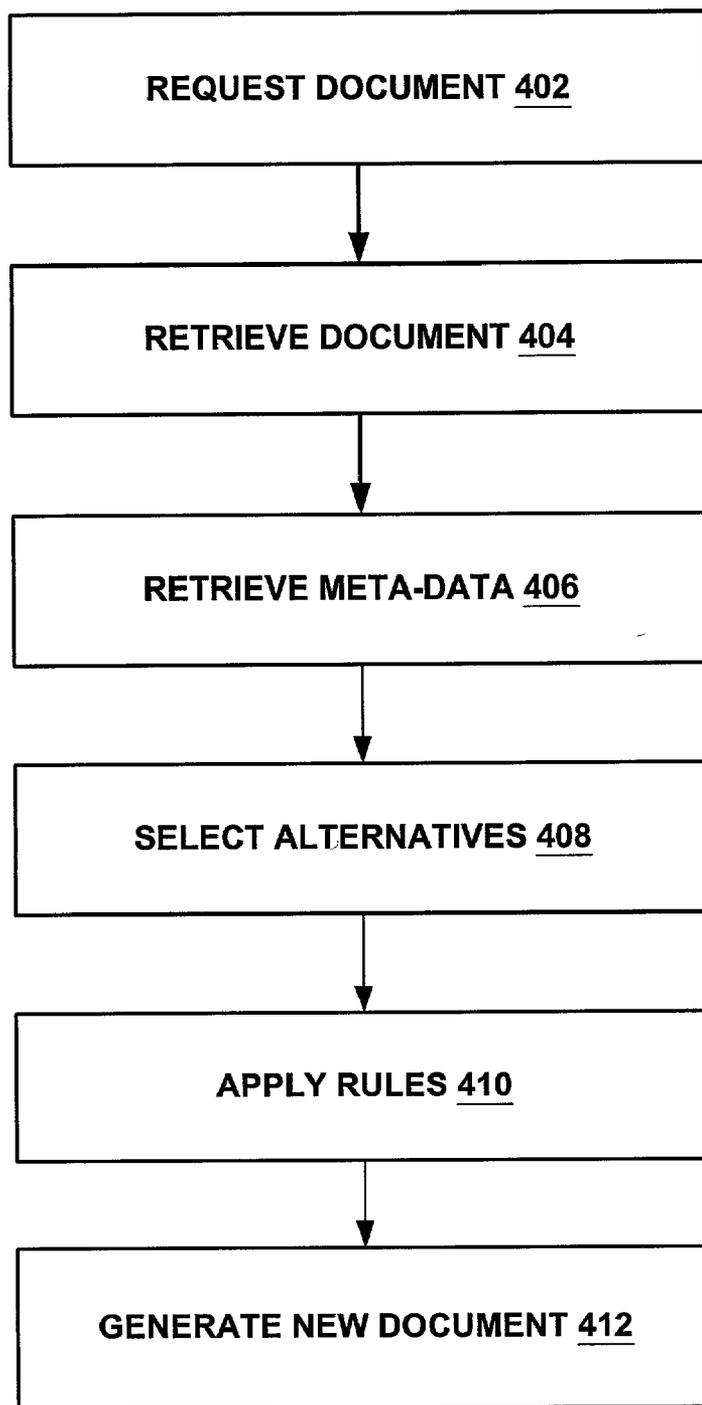


FIG. 4

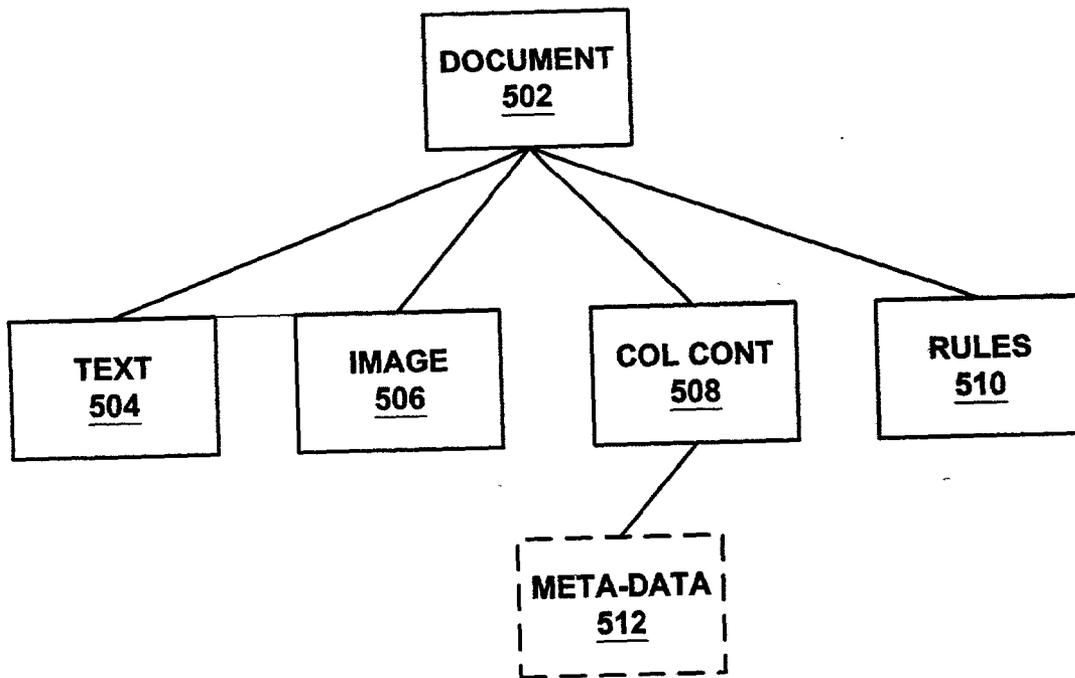


FIG. 5

CONTENT REPLACEMENT IN ELECTRONICALLY-PROVIDED ARCHIVED MATERIAL

FIELD OF THE INVENTION

[0001] The present invention relates generally to the field of computing. More particularly, the invention relates to a system and method for rendering, on demand, archived material electronically while replacing some original substitutable content in the delivered material.

BACKGROUND

[0002] As publishing costs and postage rates soar, publishers of archived material such as printed periodicals are searching for innovative ways to increase their bottom line. For example, many periodicals routinely publish electronic versions of current issues on a web site, in addition to traditional printed versions. Typically, however, such electronically available versions have failed to generate the hoped-for revenues. In fact, typically web site-published periodicals do not generate the gross revenue that their printed counterparts do. Many believe that the reason for these disappointing results has to do with the look and feel of the web product. Many believe that readers prefer the look and feel of the traditional printed product. Publishers thus have recently become interested in providing electronic copies of their publications in a form visually similar to that of the printed product.

[0003] In addition to the publication of current issues of periodicals, it is widely believed that a largely untapped market for archived material (e.g., back issues of periodicals) exists. For example, perhaps a reader would like to read an article published in the January 2000 edition of the magazine *Today's Equine*. Publishers typically make back issues of their printed publications available for sale to subscribers on a limited basis, so the reader could contact the publisher of *Today's Equine* and request to purchase the January 2000 issue. If a January 2000 issue of *Today's Equine* is available, the reader may be able to acquire the back issue. Such activity is not likely to generate large amounts of revenue for the publisher, because of associated costs of producing and delivering a printed publication and because no new advertising revenue is associated therewith. Additionally, the relevant information (e.g., the magazine article of interest to the reader) is typically accompanied by collateral information (e.g., one or more advertisements) that are no longer relevant. For example, perhaps the article of interest to the reader is an article on horses. The article on horses may be accompanied by at least one advertisement for a sale on horse feed, but, for example, (depending on how old the article is) the sale may be over, or that particular brand of horse feed may not be available in the geographic location of the requester.

[0004] Perhaps the article as published in the January 2000 *Today's Equine* is available electronically. Since typically 60-70% of the cost of producing a typical magazine is paid for by advertising, it would seem logical to exploit this potential "new" source of revenue by providing the January 2000 issue electronically, perhaps as it appeared in printed form, but with a current advertisement or with an advertisement targeted to the requestor, providing the opportunity both to receive new revenue from an advertiser and to

expand the delivery of back issues of publications or other archived material to readers. Moreover, it may be desirable to retain the look of the printed document, while replacing old collateral information (e.g., advertisements) with new information, for which the collateral information provider (e.g., advertiser) could be charged a new fee. To date, however, no mechanism to do this is known.

SUMMARY OF THE INVENTION

[0005] Archived material, such as but not limited to, television programming, a document, publication or a portion of a publication or publications containing collateral information (e.g. advertisements) is delivered to a requestor in electronic form, optionally appearing electronically as it appears in traditional printed form. Collateral information associated with the archived material is dynamically replaced, enabling the requestor to potentially receive more useful or more relevant information and enabling the publisher to potentially generate new revenue from replacing the collateral information as well as from the requestor for receiving the information.

[0006] Meta-data describes features of archived material including features of components of a document and may be explicit, implicit or inferable. Meta-data may exist as a separate entity or may be embedded within the data stream itself. In one embodiment, original documents are stored in a document store, meta-data is stored in a meta-data store, collateral content is stored in a collateral content store and rules for replacement of content is stored in a rules store. In another embodiment a tree data structure is used as a basis to generate the archived material, including the replaceable or substitutable part of the content.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The foregoing summary, as well as the following detailed description of preferred embodiments, is better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there is shown in the drawings exemplary constructions of the invention; however, the invention is not limited to the specific methods and instrumentalities disclosed. In the drawings:

[0008] **FIG. 1** is a block diagram of an exemplary computing environment in which aspects of the invention may be implemented;

[0009] **FIG. 2** is a block diagram of a software application that executes in the computing environment of **FIG. 1**, and that displays documents electronically, replacing portions of the display with updated content;

[0010] **FIG. 3** is a block diagram of an exemplary data structure for displaying a document electronically, where portions of the display are replaced with updated content;

[0011] **FIG. 4** is a flow diagram of an exemplary method for replacing collateral information associated with a document in an electronically provided document; and

[0012] **FIG. 5** is a block diagram of an exemplary tree data structure for displaying a document electronically, where portions of the display are replaced.

DETAILED DESCRIPTION OF THE INVENTION

Exemplary Computing Environment

[0013] FIG. 1 illustrates an example of a suitable computing system environment 100 in which the invention may be implemented. The computing system environment 100 is only one example of a suitable computing environment and is not intended to suggest any limitation as to the scope of use or functionality of the invention. Neither should the computing environment 100 be interpreted as having any dependency or requirement relating to any one or combination of components illustrated in the exemplary operating environment 100.

[0014] The invention is operational with numerous other general purpose or special purpose computing system environments or configurations. Examples of well known computing systems, environments, and/or configurations that may be suitable for use with the invention include, but are not limited to, personal computers, server computers, handheld or laptop devices, multiprocessor systems, microprocessor-based systems, set top boxes, programmable consumer electronics, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above systems or devices, and the like.

[0015] The invention may be described in the general context of computer-executable instructions, such as program modules, being executed by a computer. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. The invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network or other data transmission medium. In a distributed computing environment, program modules and other data may be located in both local and remote computer storage media including memory storage devices.

[0016] With reference to FIG. 1, an exemplary system for implementing the invention includes a general purpose computing device in the form of a computer 110. Components of computer 110 may include, but are not limited to, a processing unit 120, a system memory 130, and a system bus 121 that couples various system components including the system memory to the processing unit 120. The system bus 121 may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. By way of example, and not limitation, such architectures include Industry Standard Architecture (ISA) bus, Micro Channel Architecture (MCA) bus, Enhanced ISA (EISA) bus, Video Electronics Standards Association (VESA) local bus, and Peripheral Component Interconnect (PCI) bus (also known as Mezzanine bus).

[0017] Computer 110 typically includes a variety of computer readable media. Computer readable media can be any available medium that can be accessed by computer 110 and includes both volatile and nonvolatile media, removable and non-removable media. By way of example, and not limitation, computer readable media may comprise computer storage media and communication media. Computer storage media includes both volatile and nonvolatile, removable and

non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules or other data. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CDROM, digital versatile disks (DVD) or other optical disk storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by computer 110. Communication media typically embodies computer readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media. Combinations of any of the above should also be included within the scope of computer readable media.

[0018] The system memory 130 includes computer storage media in the form of volatile and/or nonvolatile memory such as read only memory (ROM) 131 and random access memory (RAM) 132. A basic input/output system 133 (BIOS), containing the basic routines that help to transfer information between elements within computer 110, such as during start-up, is typically stored in ROM 131. RAM 132 typically contains data and/or program modules that are immediately accessible to and/or presently being operated on by processing unit 120. By way of example, and not limitation, FIG. 1 illustrates operating system 134, application programs 135, other program modules 136, and program data 137.

[0019] The computer 110 may also include other removable/non-removable, volatile/nonvolatile computer storage media. By way of example only, FIG. 1 illustrates a hard disk drive 140 that reads from or writes to non-removable, nonvolatile magnetic media, a magnetic disk drive 151 that reads from or writes to a removable, nonvolatile magnetic disk 152, and an optical disk drive 155 that reads from or writes to a removable, nonvolatile optical disk 156, such as a CD ROM or other optical media. Other removable/non-removable, volatile/nonvolatile computer storage media that can be used in the exemplary operating environment include, but are not limited to, magnetic tape cassettes, flash memory cards, digital versatile disks, digital video tape, solid state RAM, solid state ROM, and the like. The hard disk drive 141 is typically connected to the system bus 121 through a non-removable memory interface such as interface 140, and magnetic disk drive 151 and optical disk drive 155 are typically connected to the system bus 121 by a removable memory interface, such as interface 150.

[0020] The drives and their associated computer storage media discussed above and illustrated in FIG. 1, provide storage of computer readable instructions, data structures, program modules and other data for the computer 110. In FIG. 1, for example, hard disk drive 141 is illustrated as storing operating system 144, application programs 145, other program modules 146, and program data 147. Note that these components can either be the same as or different

from operating system **134**, application programs **135**, other program modules **136**, and program data **137**. Operating system **144**, application programs **145**, other program modules **146**, and program data **147** are given different numbers here to illustrate that, at a minimum, they are different copies. A user may enter commands and information into the computer **20** through input devices such as a keyboard **162** and pointing device **161**, commonly referred to as a mouse, trackball or touch pad. Other input devices (not shown) may include a microphone, joystick, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to the processing unit **120** through a user input interface **160** that is coupled to the system bus, but may be connected by other interface and bus structures, such as a parallel port, game port or a universal serial bus (USB). A monitor **191** or other type of display device is also connected to the system bus **121** via an interface, such as a video interface **190**. In addition to the monitor, computers may also include other peripheral output devices such as speakers **197** and printer **196**, which may be connected through an output peripheral interface **190**.

[0021] The computer **110** may operate in a networked environment using logical connections to one or more remote computers, such as a remote computer **180**. The remote computer **180** may be a personal computer, a server, a router, a network PC, a peer device or other common network node, and typically includes many or all of the elements described above relative to the computer **110**, although only a memory storage device **181** has been illustrated in **FIG. 1**. The logical connections depicted in **FIG. 1** include a local area network (LAN) **171** and a wide area network (WAN) **173**, but may also include other networks. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets and the Internet.

[0022] When used in a LAN networking environment, the computer **110** is connected to the LAN **171** through a network interface or adapter **170**. When used in a WAN networking environment, the computer **110** typically includes a modem **172** or other means for establishing communications over the WAN **173**, such as the Internet. The modem **172**, which may be internal or external, may be connected to the system bus **121** via the user input interface **160**, or other appropriate mechanism. In a networked environment, program modules depicted relative to the computer **110**, or portions thereof, may be stored in the remote memory storage device. By way of example, and not limitation, **FIG. 1** illustrates remote application programs **185** as residing on memory device **181**. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

[0023] Content Replacement in an Electronic Document

[0024] **FIG. 2** illustrates an exemplary system for generating archived material, (e.g., an electronic document), replacing substitutable content associated with the archived material with updated, more current or more relevant content. Archived content is contemplated to include television programming, publications and any other archived material suitable for electronic rendering. Optionally in the case of printed material, the document or documents is/are displayed in substantially the identical form as the printed

publication(s) from which the document(s) is/are derived. In one embodiment of the invention, computer **110** is communicatively coupled to a remote computer **180**. Computer **110** in this embodiment of the invention is a server from which the electronic document **300** may be downloaded to client **180**.

[0025] Computer **110** stores an application **202** that generates an electronic document for display on computing device **180**. Application **202** in one embodiment retrieves a document from a document store **204**, and replaces substitutable content with updated, more relevant or requestor-targeted content according to at least one of a plurality of rules. Meta-data store **210**, in one embodiment of the invention, stores meta-data. Meta-data describes the features of a document and the features of items of the document, such as text, image(s) and collateral content. Collateral content store **206**, in one embodiment of the invention, stores collateral content, such as, for example, advertisements. Rules store **208** stores rules that are used to select content to replace a pre-existing item(s). The document may be delivered to another computing device **180**. In another embodiment of the invention, a tree structure is utilized to generate the document or other archived material including the updated content. In still another embodiment of the invention, one or more components of application **202**, such as, for example, collateral content store **206** may be resident on client **180**.

[0026] In one embodiment of the present invention, document store **204** includes a version of the document **300**, as displayed in **FIG. 3**. Document **300** may comprise an entire issue of a publication, an article of a publication, a page of a publication or any other suitable portion or combination of issues of publications. Publications as used herein are contemplated as including newspapers, newsletters, magazines or any publication suitable for reproducing electronically.

[0027] Document **300** may include text **330**, an image **332**, and collateral content **334**. Document **300** may include additional pages, additional text (not shown), additional images (not shown) and/or additional collateral content (not shown). For example, a document may include more than one piece of text (i.e., an article accompanied by a side-bar) and/or more than one photograph or image, and so on. The page on which the document appears in the printed publication from which document **300** derived may include additional items not associated with document **300** such as but not limited to, portions of another document.

[0028] Document **300** preferably is associated with meta-data, which in one embodiment is stored in data store **210**. Text, images and collateral content items are also each associated with meta-data. Exemplary meta-data illustrated in **FIG. 3** is associated with collateral content item **324** but it should be understood that meta-data for document **300**, text **330**, etc. also preferably exist in meta-data store **210** in this embodiment. Meta-data describes features of the archived material and may be explicit in nature or may be inferred or embedded within the data itself.

[0029] Meta-data preferably includes but is not limited to:

[0030] category **302** of the item, for example, may indicate that the item is text (e.g., an article), collateral content (e.g., an advertisement), or a picture or image;

[0031] geometric data **304**, for example, may indicate the page on which the item occurs in the printed publication, the size of the item and/or the position of the item on the page;

[0032] temporal relevancy **306**, for example, may indicate a time period after which the item would be considered outdated or alternatively, (e.g., the latest date that the item should be displayed), or alternatively, a time period until which the item would be considered current (e.g., a date until which an item could be displayed);

[0033] links to related information **308**, wherein the related information may be in the same document or not within the same document. Related information may include alternate versions, that is, the same document displayed with different collateral information. Related information may also include printable coupons associated with the article topic, the collateral content, and/or requestor preferences and the like;

[0034] business information **310**, such as but not limited to owner, sponsor, cost basis; and

[0035] other suitable information.

[0036] Collateral content store **206** preferably includes a plurality of collateral content items that collectively comprise a universe of possible collateral content items with which to replace collateral content items that are outdated when a document is retrieved. Preferably, collateral content store **206** includes current collateral content items, such as advertisements that are current when the document is requested and which may be used, for example, to replace original collateral content item **334**. In one embodiment of the invention, collateral content store **206** is a separate store of replaceable items (e.g., advertisements with meta-data). In an alternative embodiment collateral content store **206** includes current items, original items and substitutable items. Original items, for example, are contemplated to include content originally associated with the archived material. Current items include collateral content that is currently relevant and substitutable content represent information that may be replaced with more current, more relevant, requestor-targeted content or the like. Collateral content store **206** preferably changes over time—e.g., by replacing out-of-date advertisements with new ones. Items in collateral store **206** are associated with meta-data stored in data store **210**, which preferably include the size of the item and a date beyond which the content item is outdated or substitutable. Rules from rules store **208** preferably are consulted to determine which collateral content item from collateral content store **206** should be used to replace collateral item **334**.

[0037] Rules store **208** preferably includes rules for replacing separable items of document **300** with new items (e.g., rules for determining which collateral item(s) of collateral content store with which to replace the collateral content item of the original document to create a new document or other instance of an archived material). Hence, for example, rules store **208** preferably includes logic for selecting an appropriate item (or more than one appropriate items) from collateral content store **206** to display in new document **300'** as item **336**.

[0038] FIG. 4 shows a method of providing an instance of an archived material (e.g., a document) with new collateral information. At step **402** a document **300** is requested. Document **300** may be a publication, such as a newspaper or magazine, or an article or page within a publication, newspaper or magazine. For example, assume the article beginning on page 20 of the January 2000 issue of *Today's Equine* "Horses in America" is requested. It will be understood that there are many well-known ways in which a particular document or other instance of archived material may be requested, including but not restricted to queries based on: publication name, date and page number; publication and author's name; date and article name; topic; and various other ways, all of which are contemplated by the invention.

[0039] At step **404**, document **300** is retrieved from document store **204**. At step **406**, meta-data associated with document **300** is retrieved from meta-data store **210**. For example, document **300** may include text **330**, (an article about horses), image **332**, (a picture of a famous horse), and collateral content item **334**, (a two inch by three inch advertisement for a sale on a particular brand of horse feed). Assume further that the date of the document request is Jan. 15, 2001 and that the meta-data **320** associated with collateral content item **334** indicates that collateral content item **334** "expires" Jun. 15, 2000. Hence, collateral content item **334** is substitutable (in this case, because the content is outdated).

[0040] At step **408** one or more suitable collateral content items is retrieved from the collateral content store **206**. For example, a suitable collateral content item preferably is approximately the size of the original collateral content item or can be scaled to that size and is related to the subject of the document and is current.

[0041] At step **410** rules from rules store **208** are applied to the one or more collateral content items selected in step **406**, and one of these items is selected to replace content item **334**. In the example illustrated in FIG. 3, collateral content item **336** is selected to replace collateral content item **334**.

[0042] The following is an example of the types of rules contained in rules store **208**:

[0043] 1. Only one collateral item of same topic can be placed on a single page, (e.g., if document topic is computers, put only one computer manufacturer advertisement per page.)

[0044] 2. A collateral item selected to replace an original collateral is based on region or demographics (e.g., if the document request for the article on horses originated in Pennsylvania, replace the substitutable advertisement of horse feed not available in Pennsylvania with a current advertisement of a horse feed available in Pennsylvania.)

[0045] 3. Tie the collateral content used to replace substitutable content to consumer-related preferences. For example, if a consumer explicitly (by specifically indicating) or implicitly (by previous selections) expresses an interest in a particular topic, preferentially display content relating to that interest.

[0046] At step **412** a new document **300'** is generated with collateral content item **336** displayed in the area previously

occupied by item 334 in original document 300. Optionally, the archived material rendered, original and replacing content, information associated with the requestor and the like may be tracked, logged and/or stored for use in billing and other suitable purposes.

[0047] FIG. 5 illustrates a tree data structure employed in an alternative embodiment of the invention. In this embodiment, the nested structure of archived material is represented by a tree. For example, each item (and sub-item) of a document is represented by a node in the tree, and the meta-data for each item is stored in the item's node. For example, root node 502 represents document 300. Child node 504 represents text 330, child node 506 represents image 332, child node 508 represents collateral content item 334, child node 510 represents rules associated with document 300. Additional images, and collateral content items associated with document 300 are represented as additional child nodes (not shown) descending from root node 502. Meta-data associated with document 300 in one embodiment is included in the node to which the meta-data relates. However, the meta-data may be represented in the tree data structure in any manner—e.g., putting the meta-data for an item in the item's left-most child node (512)—so long as any program that needs to traverse the tree can find the meta-data in a well-defined location.

[0048] The tree data structure described above is advantageous because, in this embodiment, an intermediate tree structured database is created and stored when a document is requested (step 402) including design-intent information enabling automatic layout of the final document when the document is served.

[0049] The programming necessary to effectuate the processes described above in connection with the present invention is relatively straight-forward and should be apparent to the relevant programming public. Any particular programming language or methodologies may be employed to effectuate the present invention without departing from the spirit and scope thereof.

[0050] In the foregoing description, it can be seen that the present invention comprises a new and useful mechanism as described above. It should be appreciated that changes could be made to the embodiments described above without departing from the inventive concepts thereof. It should be understood, therefore, that this invention is not limited to the particular embodiments disclosed, but it is intended to cover modifications within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A method for providing archived material comprising:
 - retrieving a first instance of archived material comprising a plurality of items; and
 - determining that at least one of the plurality of items is substitutable;
 - selecting a new item according to at least one rule;
 - generating a second instance of archived material by replacing the at least one substitutable item in the first instance with the new item.
2. The method of claim 1, further comprising charging a fee to a provider of the new item for replacing the at least one substitutable item with the new item.

3. The method of claim 1, further comprising rendering the second instance of archived material.

4. The method of claim 1, wherein the first instance is retrieved from a data store resident on a first computing device, and wherein the method further comprises transmitting the second instance to a second computing device communicatively coupled to the first computing device.

5. The method of claim 1, wherein the substitutable item comprises a substitutable advertisement and the new item comprises a current advertisement.

6. The method of claim 1, wherein the substitutable item has a first position on a page and a first size, the new item has a second position on the page and a second size and the first size is substantially identical to the second size and the first position is substantially identical to the second position.

7. The method of claim 1, wherein at least a particular one of the plurality of items is described by meta-data.

8. The method of claim 7, wherein the meta-data comprises geometric data which specifies the position of the item on a page.

9. The method of claim 7, wherein the meta-data comprises category data that specifies that the particular one of the items is either text, collateral content, or an image.

10. The method of claim 7, wherein the meta-data comprises temporal relevancy data which represents a date beyond which the item is substitutable.

11. The method of claim 7, wherein the meta-data comprises a link to information related to the item.

12. The method of claim 11, wherein the related information comprises at least one of: a document, a text item, an image item, a collateral content item, and a coupon.

13. The method of claim 7, wherein the meta-data comprises business information.

14. The method of claim 13, wherein the business information comprises at least one of item provider, item owner, item sponsor, and cost.

15. The method of claim 1, wherein determining that at least one of the plurality of items is substitutable is based on the at least one item being outdated.

16. A system for rendering archived material comprising:

a first data store which stores a plurality of instances of archived material, wherein at least one of the instances comprises a plurality of items;

a second data store which stores a plurality of rules for replacing at least a first one of the plurality of items with a second item; and

a software module which creates a second instance of archived material based on the first instance by replacing the first item with the second item.

17. The system of claim 16, wherein the first item comprises a first advertisement which is a substitutable advertisement, and wherein the second item comprises a second advertisement which is a current advertisement.

18. The system of claim 17, wherein the first advertisement is determined to be substitutable by comparing a date on which a request is received with an expiration date associated with the first advertisement, wherein said date on which said document request is received is later than said expiration date.

19. The system of claim 17, wherein the second advertisement is determined to be current by comparing a date on which a request is received with an expiration date associ-

ated with the second advertisement, wherein said system date predates said expiration date.

20. The system of claim 16, wherein the data store of instances of archived material is resident on a first computing device and wherein the system further comprises a module which transmits the second instance to a second computing device communicatively coupled to the first computing device via a communications network.

21. A computer-readable medium having stored thereon a data structure associated with an item, the item comprising a portion of a document that appears on a page, the data structure comprising:

- a first data field comprising category data of the item, wherein the category data describes a type of item, the type of item comprising one of: text, an image, and an advertisement;
- a second data field comprising geometric data of the item, wherein the geometric data describes one of a physical location of the item within a page and the size of an item; and
- a third data field comprising relevancy data, wherein the relevancy data comprises a date beyond which an item is outdated.

22. The computer readable medium of claim 21, the data structure stored thereon further comprising:

- a fourth data field comprising a link, wherein the link comprises a reference to information related to the item.

23. The computer readable medium of claim 22, the data structure stored thereon further comprising:

a fifth data field comprising business information, wherein the business information comprises at least one of a provider of the item, an owner of the item, a sponsor of the item, and a cost associated with the item.

24. A computer-readable medium including computer-executable instructions for performing steps comprising:

- reading a node representative of a document;
- determining, based on the first node, that the document comprises a plurality of items, each of the items being represented by one of a plurality of second nodes; and
- for each second node:
 - determining the geometric boundaries of the item represented by the node; and
 - placing a piece of content associated with the item within the geometric boundaries of the item,

wherein a first one of the items has a temporal constraint associated therewith, and wherein the act of placing a piece of content associated with the first item comprises identifying a piece of content that meets the temporal constraint.

25. The computer-readable medium of claim 24, wherein said piece of content that meets the temporal constraint comprises a revenue-generating advertisement, wherein the advertisement's generation of revenue is dependent upon the time that the advertisement is either printed or included in an electronically-provided document.

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