DOCUMENT CONTROL AND TRANSMISSION SYSTEM

FIELD OF THE INVENTION

This invention relates to a system for quickly and largely automatically creating and transmitting any of a large number of electronic mail, facsimiles, data compilations or documents to widely distributed recipient locations, for increasing the transmission speed by a learning system, for providing a document control system and eliminating the need for using OCR for documents transmitted.

BACKGROUND OF THE INVENTION

In the operation of any business, it is necessary to send many kinds of documents which are essentially form letters, varying only slightly in content but directed to many different individuals or other businesses. Today, it is customary to generate these documents, commonly at one central location or a few such locations and transmit them by mail, i.e., using the postal service or an equivalent organization such as, in rare cases, a courier service. In this process, one is at the mercy of the postal service which is becoming increasingly inefficient and expensive and environmentally disadvantageous, using enormous quantities of energy and other resources to convey the millions of pieces of mail which it receives each year, e.g., with airplanes and trucks, frequently over very long distances.

In addition to this cost, significant time is frequently involved. This is particularly true when a letter must be sent across the entire United States, or internationally, and this delay is likely to become greater as time passes, despite the valiant efforts of the postal services to keep up with the volume of mail.

Some substitute techniques are available, such as facsimile transmission (fax) and electronic mail (e-mail). However, neither of these is usable universally: nearly everyone has a postal address, but there are many people who do not have access to computers for receiving e-mail and do not have fax receiving equipment. In addition, there are other disadvantages to these techniques. Fax involves significant cost if one is transmitting outside of a local calling area. E-mail is cheap and quick, if one uses it at a low-traffic time of day, but it does not automatically produce a "hard" (printed) copy unless the recipient chooses to make one and, under some circumstances, it can be altered by the recipient, either purposefully or accidentally, and the format is not fully controllable by the sender.

Regardless of the mode of transmission, whether it be by postal service, e-mail, fax or other means, a particularly wasteful and almost universal occurrence is the retransmission of the same information. For example, if one sends an ordinary business letter by fax, it is customary for the sender to use a heading of some kind, either a professional letterhead, a business letterhead, or some kind of special heading which contains an identification of the sender. While it is important for the recipient to have this information, a very large amount of data transmission traffic over long distances is consumed by sending, long-distance, this same information over and over again.

It is also very important in any business, and in many personal situations, to have some system of document control by which one can have a record of correspondence sent and received and by which any such correspondence can be retrieved.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide a system for repetitively, quickly and inexpensively preparing and sending to selected recipients by various possible transmission means any of a plurality of documents of largely predetermined varying or unique content.

A further object is to provide a system for drastically reducing the repeated transmission of standard logos or text, and/or standard graphics.

Yet another object is to increase transmission speed by a learning system.

Yet another object is to provide a document control system which can be used as a stand-alone system or can be used in combination with a data transmission system.

A further object is to provide for access and control of remote graphic creations and storage of graphics.

Still another object is eliminating the need to use OCR to convert the results of this system.

Briefly described, the invention comprises a method for generating and disseminating information comprising the steps of establishing a plurality of service centers at geographically separated locations and providing at each service center a control computer, a functionally divisible computer client memory, and means for producing a document output of the desired data from the memory. A portion of the client memory is assigned to each of a plurality of clients and in each client memory portion is stored data comprising parts of documents to be generated. In response to a request received from a client, a selected document is transmitted to a designated recipient. The document output can be in the form of a printed copy, an electronic transmission such as e-mail or fax, or a data compilation in some other form.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to impart full understanding of the manner in which these and other objects are attained in accordance with the invention, a particularly advantageous embodiment thereof will be described with reference to the following drawings, which form a part of this disclosure, and wherein:

Fig. 1 is a schematic block diagram of a system in accordance with the invention in a simple form;

Fig. 2 is diagram illustrating the components of a document which can be handled by a system in accordance with the invention;

Fig. 3 is a diagram illustrating the composition of a storage access and compilation code in accordance with the invention;

Fig. 4 is a diagram of a further document which can be handled by a system in accordance with the invention;

Fig. 5 is a partial block diagram of a portion of a service center showing alternative transmission techniques; and

Figs. 6 and 7 are simplified illustrations of geographical distributions of service centers in accordance with the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring first to Fig. 1, implementation of the present invention involves the establishment of a plurality of facilities which will be called service centers 10. The number, size and geographic locations of these can vary, but as will be recognized from the following description, it is believed advantageous to locate such centers near or in major concentrations of population. The service centers are interconnected with each other by a network of communications lines 12 which can be ordinary telephone lines, whether they are organized into a formal network or are used on an "as needed" basis.

While it would be quite possible for an individual corporation or other organization to establish its own service centers for its own use, or to have a direct communication link between two parties, it is contemplated that the most efficient manner of implementation of the invention is for a service company, which could easily be a telecommunications company, to establish the service centers and make them available to customers on a fee-for-service basis or other fee basis. In this fashion, very small businesses as well as large ones would be able to make efficient use of the system. System users will be referred to hereinafter as clients, whether they are individual persons, firms or companies. Nevertheless, a corporation having geographically separated subsidiaries or divisions may find it economically useful to establish its own service centers for communication within the company as well as for communication outside the company, and the term "service center" will be understood to include such intra-company facilities or any client-to-client use.

At each service center 10 are located several key pieces of equipment, illustrated in block form in one of the service centers in Fig. 1. It is contemplated that the service centers may beequipped, but this is by no means necessary and there is a strong possibility that centers having larger volumes of activity will require multiple computers as well as larger memory facilities as well as additional transmission and receiving devices to suit special needs. This equipment includes one or more control computers 14 which constitutes a communications interface with other service centers and with clients, illustrated as telephone instrument symbols 16. Connected to the computer is a large computer memory 18 which is functionally, and perhaps physically, divisible into separate sections each of which can be dedicated to an individual client. One part of the storage can be made accessible to all clients, carrying data required by all of them. Each center also includes one or more printers 20 which operate under computer control to print information received from memory 18. Printed material, symbolized by a sheet of paper 22, is conveyed to mailing equipment 24 which can take numerous forms but which includes apparatus for handling the printer output and preparing it for physical delivery to the recipients. The exact nature of the mailing equipment is, of course, determined by the mode

of delivery to be used. Automatic equipment for printing a multi-part document with an envelope is conventionally available. Alternatively, human assistance can be employed to fold and put printed material in envelopes.

The process of using the system in accordance with the invention may begin with a determination of the types of correspondence to be handled in the system for a client. It is possible to handle a large variety of correspondence in this way, but for purposes of illustration, a simple form letter will be used. The form letter is created by or for a client and stored in a portion of the service center memory dedicated to that client. Dedication of a memory portion is considered desirable for security and privacy reasons. For that client, a list of recipients is also stored, each recipient being associated in memory with some form of categorizing identification.

The form letter will have an area into which an address can be inserted and may have other areas to be completed in accordance with instructions given at the time of preparation, e.g., an amount of money. To use the system, the client gives a sequence of instructions, which will be referred to herein as a storage access and compilation code, to a service center by telephone or by a computer link with the service center. For security and billing purposes, the storage access and compilation code includes an identification of the client. This directs computer 14 to seek a skeleton form letter of document compilation in the proper portion of the system memory. The storage access and compilation code also identifies the type of form letter to be used, chosen from those which have been stored for this specific client such as, for example, a bill; the recipient, from the client's stored list of recipients; and the amount of money to be charged, along with selections of stored phrases which may be applicable to the specific form letter; and finally, an "end" code telling the control computer that the instruction is finished. As will be recognized, the instruction can include a large number of recipients and amounts of money for each, but the single recipient case will be adequate for illustration.

Upon receipt of the end code, the control computer compiles the form letter and merges it with the address information and other information or selections made in the sequence, and then prints the letter and provides the printed letter to the mailing equipment or personnel. As mentioned above, the document output of the system can be in an electronic form rather than, or in addition to, a printed document. Thus, the document produced by the above process may be transmitted electronically by fax, for example, to those recipients who have the capability to receive a fax and for whom a fax telephone number is known or, for instance, by ASCII.

Of particular importance is the fact that the service center or centers used by a particular client in a specific situation are those closest to the recipient(s). Thus, one client in a single mailing may use several service centers, each center being used for recipients in the geographic region closest to that center, thereby assuring that each letter, fax, e-mail or data compilation sent is sent the shortest distance and in the shortest time. For this purpose, when a mailing list for a

client is first created, or when it is updated, the addresses can be distributed to the centers in closest proximity to the addresses and each center stores the form letters appropriate to those addresses.

For communication purposes, the client can always communicate with the service center closest to the client, either for purposes of ordering one or more compiled forms sent or for updating data, and the control computer in that closest service center can then communicate the information to the appropriate other centers through the network between centers.

The geographic distribution of service centers can be nationwide or it can cross international boundaries. Worldwide distribution of information with the system therefore makes fullest use of the system since transit times in international mailing, for example, are measured in days or even weeks. With the system of the present invention, the transit time can be measured in a single day or less.

For international distribution, it is important to send material in the appropriate language which means that it must first be created and stored in languages appropriate to the intended geographic distribution.

It will be apparent that considerable planning and preparation must precede full use of the system according to the invention. However, this presents no obstacle since a client's use of the system can be started with the simplest forms requiring only minimal merging and insertion of data and can then grow into more complex usages with documents having, for example, multiple choices of material to be inserted.

From this simple example, some significant advantages will be apparent. First, the client need make only a short, low-cost telephone call. Secondly, the string of information forming the storage access and compilation code can be prepared in a simple format in advance of the call, and can easily be prepared on a personal computer or the like. Then, when the string is complete, it can be transmitted all at once, in a very short time. Third, when the material for each letter, e-mail, fax or data compilation is compiled and printed by the service centers, the letters, etc., are sent to recipients which are local relative to the service centers. Thus, when the service centers are distributed internationally, letters, faxes, or electronic transmissions can be received in Hamburg, Germany and Cleveland, Ohio at essentially the same time without the expense of otherwise required international mail or telephone calls, and without regard to the location of the client.

Since the client need only provide a storage access and compilation code and the changes or insertions for the documents to be compiled, if any, less time is consumed in preparation of the documents. Because the system has a much shorter delivery time at the output end of the system, transmission is also quicker at the receiving end. Thus, time savings are realized at both ends of the system and this transmission speed increase can be supplemented by any speed increases

which are realized by improved technology.

While most of us are familiar with the general layout of a letter, for instance, it will be useful to look at one in detail for present purposes. Fig. 2 illustrates the customary components of a letter as it might be examined for use in this system, each component occupying a predetermined field of the final document and being represented by a labeled box. Most letters have a logo at the top which may vary in size but which will be standard for a specific client, or which may be selected from a few similar logos if the client has multiple divisions or departments which use their own logos. As used herein, the term "logo" includes such things as a company trademark, trade name and/or symbol, a professional letterhead, or simply the name and address of the client. In European countries, the information which customarily appears on a letterhead and which may be included in "logo" for present purposes includes bank connections and a register number under which the company is officially registered. For purposes of the present invention, a client's memory section will store the logo(s) for use with all designated documents to be generated.

The next item is the date which can be inserted at the service center automatically, as with conventional word processing programs. If desired, the time and date difference between countries can also be taken into account so that the document bears an appropriate date, or even both the sender's and addressee's dates. This can be especially important if the transmitted document has legal significance. For example, assume that a client in Maryland sends a document request to its local service center at 10 PM on March 14 in order to meet a March 14 deadline in Germany. The document would be received shortly after March 15 at 4 AM in Germany, but if the document bears an automatic sender's date stamp of March 14 it may satisfy the time requirements.

Next is the recipient's name and address. It is contemplated that letters will be sent by this system to a group of recipients, and that the group is predetermined by the client and is identifiable as such. This field is therefore completed by a merge function as the letters are generated.

A "subject" line is often next, followed by a greeting which may employ part of the information from the recipient name and address field. The content or message of the letter then is generated, possibly with insertions to customize the letter for the individual recipient. A form letter of a specific type will have need for a specific number of insertions which may be amounts of money, dates or intervals of time.

After the message is a closing and a signature block which may include a reproduction of a signature of the sender. Finally, if any attachments are to accompany the letter, they are identified at the bottom of the letter, also possibly distribution. While other components may exist, the foregoing will suffice for the present.

Preferably, in order to create such a document, whether a letter or other form, the client constructs and transmits the storage access and compilation code. Each client constructs the storage access and compilation code in a standard format, which may be dictated by the operator of the service centers. Alternatively, the code format may be selected or customized for use by an individual client. There is some advantage to having different code formats for different clients for security reasons, making it more difficult for anyone attempting to gain unauthorized access to the system electronically. While not all components of the storage access and compilation code will necessarily be used by each client, places for various components may be included in a specific sequence in the code so that they can be used if desired. If they are not to be used, a "skip" symbol can be inserted. Fig. 3 shows the possible sequence of a storage access and compilation code which performs the necessary functions, although the order can be re-arranged and functions can be added or subtracted, or covered by a single code, depending on the needs of the clients, as dictated by experience.

A speed increase can be achieved by creating a single overall cross-reference compilation code for any letter to be transmitted (text and/or numbers and/or graphics) as well as for any single change from data elements compiled from any of the single stored data elements and graphics (for instance, a logo). A letter starting with, for instance, "Dear Sir" would have a different overall single access and compilation code, from an otherwise 100% identical letter starting "Dear Madam", this being the only exception.

It should be mentioned that layout can be modified or assembled on screen if desired. While this is slower, the capability should be provided for new clients, or to develop new layouts based on old ones. In the manual process, the data for the letters, etc., may be defined by manually selecting the locations using menu instructions, i.e., locations for logo, date, address, etc., as generally described above.

In Fig. 3, each portion of the storage access and compilation code is illustrated by a labeled block. One of the first components must be an identification of the client with enough information to facilitate recognition of the memory region to be used and to accommodate the needs of security and the service center's billing processes. The next component is an identification of the category of form letter to be used, called the form type. The actual form letter has already been created and resides in memory at the service center with codes at appropriate locations to indicate the need for insertion of variable data, or the components for the letter or other document are stored and compiled by program.

Another portion of the storage access and compilation code may identify the language to be used for the document or part thereof. Alternatively, a language code can be associated with each address so that a specific recipient will always receive documents in an appropriate language. Then, the recipient group or category can be identified. This can be handled by pre-grouping the

recipients and identifying the group or groups; or the addresses can be associated with identifications of certain characteristics of the individuals (income level, interests, etc.) and the set of recipients can be identified by specifying characteristics, leaving the control computer to sort the recipient lists for recipients having the named characteristics.

The signature block (if there is more than one for this client) can then be named along with any attachments comprising, for example, advertising material or special offers, also any possible distribution.

If there is unique data within the message to be inserted, this information can be supplied with one or more tables correlated with the recipient names. Preferably, for any given group of letters to be generated and sent in a single mailing, only one code string is generated as the storage access and compilation code with ancillary information, such as message insertions, provided as an attachment to the string. However, if the letter is more complicated with numerous insertions or variations, a separate string may be needed for each letter. While this makes the storage access and compilation code string longer, the distribution advantages are still attained.

A storage access and compilation code string as described above can, for instance, consist of a series of alphanumeric symbols accompanied by special symbols with predetermined meanings. The string might begin with a client identification Ac8%*, followed by a separator symbol #, followed by a form type G32, another separator, a language code DE, another separator and a recipient group. The string might, for instance, therefore begin: Ac8%*#G32#DE#XV4.... Variations and different approaches will be apparent to those familiar with generating commands for other purposes.

An objective of this system is for each client to create a library of documents which can be customized for individual recipients with appropriate insertions, and then reused many times. However, as suggested above, this "library" may actually be a virtual library consisting of a number of phrases or sentences. Thus, a letter of a certain type may consist of a selection of fifteen stored sentences which are assembled when the letter is needed. In this case, the client, in the storage access and compilation code, identifies to the control computer the final document which is desired and the control computer assembles this document from the component library under the control of a simple program. As with any computer system, it is prudent to provide a backup memory system or a redundant memory which can be used if the main one becomes unavailable.

The fact that the system has, in storage, all past writing for each client permits a further feature to be introduced which is a form of learning by the system. The system can include a separate program which searches through the stored material and counts how frequently various phrases and sentences are used. Those which are used frequently, or which have been used more

than a selected number of times, are stored at the service center and are available to the writer's computer system. Then, when the identical phrase or sentence is typed in by the user, the machine recognizes this as one of the frequently used phrases and only transmits to the service center a short code identifying the phrase. This further reduces the material which must be transmitted and , as more is written and stored, less material need be transmitted. This recognizes the fact that most writers in a business context tend to write the same phrases over and over. Ultimately, many entire letters will fall into this category.

A notable advantage of the system is the ability to store at each service center involved in a specific communication link the text (in code) of a document. thus, if a contract is being negotiated by two parties who are at distant points and are using the service center system, each paragraph or clause of the document being negotiated can be identified in a customary manner by letters and numbers and then only the changed part need be transmitted. This can be provided by automatic means. However, the full document can be provided to each party with the changes incorporated. This provides a very great saving over the conventional process of sending the entire document, typically by e-mail or fax, each time a portion thereof is changed. Although the "paperless" office has been predicted for years, it has yet to be realized, and although the demise of the fax machine has been predicted because of the advent of e-mail and related electronic techniques, it is likely that faxes will still be in use for years to come, lately also increasingly for advertising purposes. Also, it is possible to store and process standard graphics in the same manner as the stored logo or text and furthermore to create graphics.

For record keeping purposes, it is also possible to store each merged document which has been sent and to relate each such document with the individual recipient's file. Generally, this need not be done on a real-time basis, so long as the document reaches the recipient's file in a reasonable time. The document can be created and sent to the file either electronically, by fax or on paper, depending on how the records for that client are kept. However, in addition to the above, it is desirable for the client to be able to request confirmation and time of delivery. Depending on the delivery technique which is being used, the service center can easily provide an automatically generated confirmation of the time when a document, e-mail, fax or data compilation, or sets of them, was sent from the service center and/or notification of delivery. The client can also print a record of what is sent and the service center system can provide a monthly summary to reduce transmissions.

Using the capabilities of the system described above, it is possible to introduce a new system for maintaining control of all documents sent or received through the system. As a first step, all electronic transmissions should be maintained in a single code format, such as ASCII. If received information or information electronically transmitted to a recipient is in some other format, such as HTML, for example, it should be converted to ASCII.

In one approach, each document sent or received by the system is then given a unique "mark" by which it can be identified. This mark may actually be printed on hard copies of the document, but the mark is at least stored in conjunction with a stored copy of the document. The mark can, for example, include any or all of the following: date sent or received (easily inserted by the system program), the sender and/or recipient (individual as well as company), the subject of the document, and a document category (letter, bill, etc.), or any other characteristics chosen by the customer. The amount of information to be included in the identifying mark is, of course, selectable and changeable by the customer. Additional possibilities are the use of all data elements outside the "start-out" unique data such as logo, addressee, date-hour-minute-second, subject, sender name, attachments, if named, distribution, etc.

The group of linked letters such as, for instance, order-sale-bill and/or senders name (signature). During menu operation, date and/or times can be added to a specific date/time file (meetings, target dates) by the sender, while another specific file can be established for names only, by the same method. This is not to be considered a prerequisite but much more an added possibility. Also, it is not restricted to these possibilities. The customer is simply offered possibilities of easy access to, and retrieval of, documents. This can all be achieved by adding to specific files selected search words during menu operation. The control of the unique (variable) data, once all of the above control means have been provided can be provided by creating a pool of unwanted words (like, for instance, I, you, when, why, and the like) having no value as search words. The pool is used to eliminate these words as search words. Another pool of words having to do with the individual operation/organization of the sender (or addressee) can be established for being accessible by operation/organization search words.

The above offers numerous possibilities of single or combined means of control, access and retrieval of documents, saving extensive administrative time and cost. While this document control can be combined with the foreseen speed increase in data transmission, it can also be used as a stand-alone document processing system. Use of the unique "mark" can of course be made alone for the sender, or with an added provision for the addressee, permitting added individual control, outside of all other possibilities offered. Also, fonts of the sender can be linked to the logo of the sender for another quick selection means.

In the case of a document sent at the request of a customer, an ASCII version of the document with the identifying mark included is provided to the sender. A printed copy may also be provided, if desired, but the important part is providing the document is code because this eliminates the need for scanning the document through any optical character recognition (OCR) system. If a transmission system in accordance with the invention is routinely used for all correspondence of a business, there is no need for OCR, and every document sent or received through the system is automatically marked and stored in a form which permits easy retrieval and

searching in a standard manner. On the other hand, this can also be achieved with a stand-alone system. When providing the ASCII document to the recipient it can, for instance, be

- by hard copy with the ASCII transmitted by the service center, or
- by hard copy with the ASCII provided in the form of a diskette.

Both possibilities in a combined way

- provide the document,
- provide control of access and retrieval of a document, and
- provide the non-requirement of OCR use.

This can be enhanced by searching each document for key words which may be pertinent to the customer's business. A key word selection process similar to that described in U.S. patent 5,109,439 may be used for this purpose. As an alternative or parallel technique, a menu system can be used. In such a system, the document to be sent is displayed on the screen and a pull-down menu is displayed allowing the user to select those items to be used for storage. Additionally, the user can select key words for use in storage by, e.g., highlighting the words. As a stand-alone system for OCR replacement, a diskette can for instance be created or the coded data be transmitted by the service center to the addressee.

Once a system of this type is in place, it can also be used for a customer's notes or memoranda. The notes need not be transmitted through the system but can simply be entered in the same fashion, stored in coded form and then retrieved or searched for in the same manner as correspondence. Again, both document control as well as eliminating the need for OCR can be used as stand-alone systems.

A data transmission speed increase for the unique data in a learning mode can be achieved in the following way.

The sender, having stored all transmitted letters, notes, etc. could while creating a document by menu have the system immediately or at times or at set intervals run comparison checks on any of the transmitted unique (variable) sentences transmitted in the past. The sender could, for instance, have several sentences which are identical, or nearly so, transferred to the service center with an automatic access code, usable within subsequent compilation processes. This code being identical to the one correlated with the selected sentence of his file. Of course, the system, when searching for identical sentences could also accept similar sentences (with one or several words to be deleted, changed or added) for inclusion in the service center storage for that sender. The system could be instructed to run this part fully automatically and/or include human intervention to check, also preventing the storage of unwanted sentences, for whatever reason.

Using this approach, the system, in a learning mode, will permit less and less data to be transmitted, eventually reducing it to an absolute minimum. Of course, this approach is also usable directly from user to user, as a stand-alone system.

The foregoing sequence of events is based on the assumption that the computer output being sent will be directed to a rather large number of recipients, i.e., more than just two or three, but it is also quite possible to use the system to advantage with transmissions which are directed to one person, perhaps with information copies to two or three others. An example is a legal document of a type which is routinely sent in a particular type of litigation. For documents of this type, standard paragraphs and sentences are stored in the client's storage area along with a framework document, such as the basic form for a complaint, into which appropriate paragraphs can be inserted. For preparation purposes, it is desirable for the client to be able to access the stored document components so that the stored paragraphs and sentences can be reviewed and selected. Alternatively, the stored material can also be stored in the client's computer system for review and identification of the components to be used, permitting the client to then construct the code string for transmission to the service center.

In any such document, a signature block is desirable and can be included using digital signatures such as those developed for use in other forms of electronic document transmission. A facsimile signature can also be printed on the document.

In the examples above, the client's order for generation and transmission of a document has been sent by some electronic technique to the service center. While this is believed to be the most expeditious technique, an order can also be sent to the service center by a technique such as fax. For this purpose, the service center will need to have a fax receiving and composing device as well as a fax bridge and an electronic reader or scanner so that the storage access and compilation code discussed above can be converted into the electronic form which the computer will need. Otherwise, the system can remain the same. If the received fax is in a form which can be recognized directly by the computer, some of the above apparatus may be unnecessary.

Particularly to eliminate the repeated information transmission mentioned above, the system can efficiently receive, supplement and retransmit fax messages. As an example, consider sending a fax from Frankfurt, Germany to Los Angeles, California. The client, using the system of the present invention, sends to a service center a storage access and compilation code identifying the recipient and the nature of the document to be produced (i.e., a fax) along with the message content. At a service center close to the intended recipient, the message content is combined with the identified form layout, addressed appropriately and re-transmitted. The recipient receives the entire message, including whatever header information is prescribed, but the only part which is sent over a long distance, e.g., by e-mail, is the message content and the relatively brief storage access and compilation code. The cost is thus drastically reduced and the time is also reduced. It should also be noted that most letters transmitted are one page letters, and faxes are generally transmitted with a cover letter, or the cover letter carries the message.

This is illustrated in Fig. 4 wherein a typical fax 35 is shown. Those portions 36 of the fax

which are unique to this message are outlined in dot-dash lines. All of the rest is standard, repeated material which can be stored at the service center, including the address and fax number of the addressee, combined with the unique portions received from the client and then forwarded to the recipient. The elapsed time for combining the unique message portions with the stored portions is very small, so the total time required for transmission of the message is substantially the same as it would be without the present system, yet only the message portion and a short code phrase need be transmitted long-distance. The cost is therefore drastically reduced and the transmission line is freed for use by other communication customers. It will be recognized that, when this process is multiplied by the thousands of times this saving is made over the course of a year, the net savings are very significant. Of great advantage is the possibility to transmit by, for instance, e-mail and to change, for instance, to fax or other media at the service center, changing media to the addressee, i.e., seeking the least expensive transmission medium from sender to service center with a possible change to another medium from service center to addressee. Having characters, special signs and numbers stored in image, as well as other required graphics stored at the service center, permits transmission by e-mail of the contents of a fax to be compiled at the service center.

From the examples and descriptions given above, it will be recognized that the greatest savings may result from use in countries such as Europe or Canada wherein the postal systems are relatively expensive or are subject to occasional interruptions. For example, assume that a client wishes to transmit similar letters to correspondents in several European countries. A service center physically located, for example, in Copenhagen, Denmark, can be chosen as to distribute these letters. When the code string is generated and transmitted to the service center, the letters are generated and sent in the appropriate languages to various countries which, with development of the European Community (EC) may shortly have a uniform postal system somewhat like that in the U.S. This permits sending the letters from within the EC, taking advantage of the advantageous rates for local delivery. Of course, it is also possible to use multiple service centers located in various places in the EC if transmission times are even more critical.

The service centers can also be used for information dissemination. Assume, for example, that a manufacturer wishes to make available to interested members of the public lengthy, detailed information about its products. It would be quite expensive and wasteful of resources to publish large numbers of a document describing the products, knowing that many and perhaps most of them will be discarded by those who are not seriously interested. However, it is a simple matter to store the information electronically at a service center, or at all service centers, and to then publish in a relatively short magazine advertisement that the information is available "at your nearest service center", whereupon the interested customer contacts the service center,

requests the information using identification codes provided in the magazine, and the service center either prints the information or writes it to a CD-ROM and delivers it in the same manner as any other document to the customer. This service can be paid for by the company or by the customer, depending on the nature of the information.

In a similar fashion, the system can be used for public services. Consider, for example, a government agency such as the Internal Revenue Service or the Patent and Trademark Office which have forms and information publications for distribution to interested members of the public. Storing such forms at service centers would make them available to the public with little or no human involvement and would permit a person to seek and obtain the forms at a larger number of convenient locations than is presently economically feasible.

Fig. 5 illustrates more fully a service center which is equipped with data transmission apparatus such as one or more modems 25a-n for receiving and sending e-mail and data files by direct transmission as well as fax machines 26 for sending and receiving fax transmissions, electronically as well as using hard copy. The modems are connected to control computers 14a-14n, all of which are preferably in bidirectional communication with each other and also with memory 18. A writeable CD-ROM 28 is also provided for creating and disseminating relatively large volume documents, as well for storage of some materials.

In this connection, the service centers can also be used as a form of substitute publishing facility. Since it is an easy matter to store large quantities of data in such a facility, one can store entire books therein and make the books available to purchasers, either on a print basis or on limited reproduction CD-ROM disks. Upon payment of a designated fee, a customer can request a specific book which the service center then prints on request. This eliminates the need for maintaining a stock of printed texts which may or may not sell. Parts of the stored books may also be made available for advance viewing so that the potential customer may "thumb through" a book to see if he or she is interested. The storage for this purpose can be on CD-ROM or other storage, preferably high-density. The substitute publishing approach may also be used in connection with local book stores, extensively reducing such costs as, for instance, as for transportation and storage.

A few examples of the types of documents which can advantageously be processed with a system of this type are the following:

billing

billing reminders

announcements

invitations

notification of date of completion, time limit, extension of term

cost estimate, cost breakdown

praise, commendation

reminder

press releases

However, a huge number of types of documents can advantageously be handled in this way by a system in accordance with the invention and that the above barely scratches the surface. Another approach permits the remote access and control of graphic creations and changes to graphics in incremental steps, either via access and compilation codes to stored programs, or by compressed codes for remote graphic manipulation. The basis for such an approach would be stored patterns of pixels of various sizes and shades which could be manipulated and controlled by compressed code to be multiplied and moved into any form, direction or structure desired, such as, for example, vectors, circles squares, etc., also creating engineering drawings, or changes, deletions or insertions to such drawings. In this last example, for instance, a representation of a valve could be extracted from storage and inserted into a drawing, while the valve could also be remotely drawn. The control could also include imploding or exploding the drawing(s) or parts thereof. Storage of such graphics can be in microform. Further control could, for instance, be assigning locations within a given area, also moving graphic elements in desired directions, overlaying and/or creating structural designs.

Of immense importance would be a service-center-stored program allowing, for instance, drawing lines or boxes, as is customary for many forms, such programs being accessible by a storage access and compilation code. On the other hand, a remote addition or change to service center stored graphic material could be achieved via compressed codes, 3 bytes, for instance, covering 16 777 216 possibilities of single instructions, a fraction thereof having to be used for various individual manipulations.

In an overall view of the system of the invention, use is made of the principal that a client can store in a service center memory a variety of phrases, sentences and designs, including logos, transmit by any convenient means to the service center a brief code identifying the format of the desired final document along with unique portions such as a message, and the service center then compiles the desired document/letter and phrases, sentences and the like and sends the resulting document, by any of the transmission techniques available and appropriate, to the intended recipient. In addition to the cost savings and speed increases, the system permits an organization using it to delegate a certain amount of work normally performed by members or employees to the service centers, further reducing time and cost. It should also be mentioned that the system should permit selective deletion of information by a client.

Figs. 6 and 7 give an overall view of the kind of service center distribution which is

contemplated. Of course, the numbers of service centers can be much larger that that depicted for a general purpose system, but can also be smaller for a system dedicated primarily to communication within a large corporation, although there is no reason why a corporate system cannot be connected to a larger system.

As seen in Fig. 6, service centers can be distributed throughout the United States. Omission of such locations in the central portion of the country in the Figure is only for simplicity of illustration and should not be interpreted to suggest that such centers would not be located there. Near each service center are clients and recipients which would preferentially be serviced by the closest center. Bidirectional communication is provided between centers and with clients.

Fig. 7 shows, in much simplified form, distribution of such centers throughout the world, several locations having been chosen for illustration. As will be recognized, satellite communication will shortly be providing high-level communication even to those countries without a communications infrastructure, and provision of service centers will further facilitate bringing those countries into full communication with the more developed countries of the world.

For those customers to whom security is a particular concern, certain steps can be taken to assure the customer that the contents of documents sent through the system are secure. One such step is to use cryptographic techniques for all electronic transmissions between service centers and customers, including electronic transmissions to recipients.

The possibility remains that an employee of the service center might be able to view a document if it is being sent by printed copy to a recipient since it must exit a printer and be placed in an envelope or the like to be delivered. The printing and enveloping can be done entirely automatically using known techniques. To assure the customer of this security, a video camera can be provided at the site between printing and enveloping, aimed at the path for the secure document. The video image of the document location can then be recorded during this process with the date and time (hour, minute and second) which may, for instance, also be printed on the document at the same time together with the date and rime of the sender in case of different time zones, and the identification mark of the document, showing that there was no person in a position to view the document. Of course, the camera should be directed so that the document cannot be read via the camera itself.

While certain advantageous embodiments have been chosen to illustrate the invention, it will be understood by those skilled in the art that various modifications can be made therein without departing from the scope of the invention as defined in the appended claims.

CLAIMS

1. A method for generating and disseminating information comprising the steps of

establishing a plurality of service centers at geographically separated locations,

providing at each service center a control computer, a functionally divisible computer client memory, and means for producing a document output from the memory,

providing at each service center communication means for communication between the service center and a plurality of clients,

assigning a portion of the client memory to each of the plurality of clients,

storing in each client memory portion data comprising parts of documents to be generated, and

in response to a request received from a client, generating a document output of selected format and content and designating unique data and transmitting the document output to a designated recipient.

2. A method according to claim 1 including electronically interconnecting the service centers with each other for bidirectional communication between each service center and each other service center.

3. A method according to claim 1 including establishing a storage access and compilation code having a recognizable format for transmission by a client to a service center to request a document, the code being recognizable by the control computer to identify the client, a document format and selectable items of document content including items of unique data, whereby the control computer selects one or more document components from the client's assigned memory portion, and assembles the components to form the requested document.

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4. A method according to claim 1 including electronically transmitting the document output to the recipient.

5. A method according to claim 1 including electronically transmitting a printed copy of the document output to the recipient.

6. A method according to claim 1 including transmitting the document output to the recipient by facsimile transmission.

7. A method according to claim 1 wherein the service center comprises facsimile receiving and transmitting equipment.

8. A method according to claim 1 wherein the service center comprises printing and mailing equipment.

9. A method according to claim 1 wherein the step of generating includes adding a date to the generated document identifying original date of transmission from the client.

10. A method according to claim 1 including electronically marking the generated document with preselected identifying information, and storing the generated document and identifying information in a standard computer format.

11. A method according to claim 10 and including providing an electronically stored copy of each transmitted document and identifying information to the client.

12. A method according to claim 10 and including repeatedly and automatically reviewing the text of output documents stored for a client to identify phrases repeatedly used by that client and which are not part of the stored data, and adding the identified phrases to the data

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comprising parts of documents to be generated, thereby reducing unique data to be added to output documents.

13. A method according to claim 1 and including translating the requested document into a selected language other than the language of the original request, and transmitting the document in the selected language.

14. A method according to claim 1 and including storing at the service center a copy in electronic, computer-readable form of each output document for a client, and providing to selected recipients output documents for said recipients in computer-readable electronic form without regard to the form in which the output document is initially transmitted to the recipient.

15. A method according to claim 1 wherein the request received from a client can be received in any of a plurality of communication forms including facsimile and electronic transmission, and wherein the step of transmitting the document output to a designated recipient includes transmitting by a communication form selected for efficiency without regard for the form of request transmission from the client to the service center.

16. A method according to claim 1 including assigning a common portion of the client memory to all clients, the common portion being available to any client, and storing in the common portion phrases and sentences commonly usable by multiple clients.

17. A method according to claim 1 wherein the client memory includes stored graphic elements and the step of generating a document output includes compiling the document from the graphic elements stored at the service center.

18. A method according to claim 1 wherein the client memory includes stored graphic elements and the step of generating includes transmitting selected codes from the client to the

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service center for selecting and manipulating the stored elements to create and modify graphical creations at the service center.

19. A method for controlling and tracking the dissemination of documents comprising

providing a service center having communication means for communication between the service center and a plurality of clients and between the service center and a plurality of recipients of output documents generated for the clients,

storing at the service center a copy in electronic, computer-readable form of each output document for a client, and

providing to selected recipients output documents for said recipients in computer-readable electronic form without regard to the form in which the output document is initially transmittee to the recipient.

20. An apparatus for generating and disseminating information comprising

a plurality of service centers at geographically separated locations, each said service center including

a control computer,

a functionally divisible client computer memory with portions thereof assigned to clients, each client memory portion having stored therein data representing parts of documents to be used repeatedly in documents generated,

means for compiling a document output from said memory using said stored data, and

communication means for communicating between said service center and a plurality of clients and between said service center and a plurality of recipients;

said control computer, in response to a request received from a client, generating an output

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document of selected format and content using said stored data and any unique data furnished by said client and transmitting the output document to one or more designated recipients.

21. An apparatus according to claim 20 wherein said service center is geographically significantly closer to said recipient than to said client.

22. An apparatus according to claim 20 and including means at said service centers for storing documents available for sale, and means for printing and dispensing said documents in response to receipt of payment.

23. An apparatus according to claim 20 including means responsive to voice input for generating text.

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