

A TELECOMMUNICATIONS METHOD AND SYSTEM

This invention relates to a telecommunications method and system for providing access to an information source, in particular the Internet, over a television cabling network and using a television receiver as the graphical user interface.

- 5 At present, when Internet access is to be provided throughout a building such as a hotel, hospital, research centre or other, a computer needs to be installed in each room of the building and have access to a telephone line in that room. This can be a very costly process requiring not only numerous computers to be purchased, but additional installation of a new telephone line for each room, if required, as well
10 as cabling for the computer. Furthermore, where only one telephone line exists in a room, it creates a highly inconvenient situation whereby when access to the Internet is desired, and therefore uses the telephone line, no incoming or outgoing telephone calls can be received or made whilst the user is connected to the Internet.

- The present invention seeks to overcome these difficulties by using a conventional
15 television receiver, which is usually available in each room of a hotel, as the graphical user interface to replace the computer and by using the TV aerial socket to connect to the television cabling network instead of using the telephone line in the room. This reduces the cost of implementing access to the Internet by not needing to install computers together with extra cabling in each room.

- 20 The present invention provides a telecommunications system for providing a plurality of users access to an information source, said system comprising:

a plurality of computing processors linked to said information source through server means;

- said server means receiving and transmitting digital data between said
25 information source and plurality of computing processors;

conversion means for converting digital data into analogue data for transmission and reception over a television cabling network, and vice-versa, and television receiver means for graphically representing said analogue data so as to

visually present information from said information source to the user;

said cabling network linking individual television receiver means; wherein access to said information source is provided on a shared basis and one of said processors is assigned to each user on the system for manipulating the information
5 and providing the user with the graphical representation of said information.

The server means may be linked to said information source through a service provider. The server means may also transmit to, and receive from, each one of the plurality of processors that are in use, information represented by said digital data.

The user may interact with the visually presented information through a remote
10 keyboard by entering data using keys of the keyboard. Preferably the remote keyboard is linked to the television receiver means by infra-red communications.

A controller means may be connected between the plurality of computing processors and the conversion means to control access by the users to the computing processors by assigning access on the basis of availability of the
15 computing processors.

The conversion means may comprise a modem and interface processing unit, with each interface processing unit being associated with respective television receiver means, and the conversion means may interface the receiver means with the plurality of processors.

20 The server means may be linked to said plurality of processors through a local area network.

The present invention also provides for a telecommunications method of providing a plurality of users access to an information source, said method comprising the steps of:

25 transmitting and receiving digital data between said information source and

a plurality of computing processors through server means;

converting said digital data into analogue data, and vice-versa, for transmission and reception over a television cabling network;

visually presenting to a user said analogue data on television receiver means,
5 representative of information supplied by said information source;

wherein access to said information is provided on a shared basis and each user has an assigned computing processor to manipulate said information, under the control of the user, and to visually present the information to the user on said television receiver means.

10 A service provider may be linked between said information source and server means to transmit and receive said digital data, representative of information received from or transmitted to said information source and the server means may process the information between the service provider and each one of the computing processors that are in use.

15 The method may also include controlling access by the users to the computing processors by assigning the access on the basis of availability of the computing processors.

The user may interact and manipulate with the visually presented information through a remote keyboard by entering data using keys of the keyboard. Preferably,
20 the remote keyboard is linked to the television receiver means by infra-red communications.

The conversion step may include using a modem and interface processing unit, each interface processing unit associated with respective television receiver means.

The server means may be linked to the plurality of computing processors through
25 a local area network.

A preferred embodiment of the invention will now be described, by way of example only, with reference to the drawings wherein:

Figure 1 is a block diagram of a telecommunications system according to the invention showing its components and the relationship between the components;

- 5 Figure 1(a) is a block diagram of software components for a server and user/client of the system.

Figure 2 is a schematic diagram of a user interface showing directories and sub-directories available to the user;

- 10 Figure 3 is a schematic diagram of a start-up screen for the Premier Services directory;

Figure 4 shows a typical web page for the Premier Services directory layout with function keys;

Figure 5 shows a typical screen with function keys for when a user is using a web browser to search the Internet's World Wide Web;

- 15 Figure 6 shows a screen for sending a message via electronic mail with function keys;

Figure 7 is a schematic diagram of the administration software implemented by a server of the system;

Figure 8 is a schematic diagram of a general administration module screen;

- 20 Figure 9 is a schematic diagram of a World Wide Web administration module screen;

Figure 10 is a schematic diagram of a Premier Services administration module screen;

Figure 11 is a schematic diagram of an e-mail administration module screen; and

Figure 12 is a schematic diagram of a status display administration module screen.

- 5 Figure 1 shows a telecommunications system 2 in which access to an information source, such as the Internet 4, is made possible for a plurality of users by using a number of computing processors 6 together with a standard television receiver 8 and conversion means 10 connected between the computing processors 6 and receiver 8.
- 10 Typically in a hotel or hospital each room will have such a television receiver 8 connected up to the hotel television cabling network 12 for radio frequency (RF) reception of television signals. To receive such signals, each television receiver 8 connects into the RF aerial outlet or socket to integrate with the hotel cabling network which in turn receives the signals in conventional manner.
- 15 Connection to the Internet 4 is through an Internet Service Provider (ISP) 14 through gateway 16. The ISP 14 is connected to the hotel server 18 through communication link 20, the hotel server 18 receiving signals from and transmitting signals to up to 32 computing processors 6 over a local area network 22, such as an Ethernet network, linking each processor 6 to the server 18 through PCMCIA
- 20 adapted links. The computing processors 6 handle Internet requests from guests or patients through an INTRANET network, using an I-NET 225 TCP/IP software stack which operates over the PCMCIA Ethernet network connection to the server 18, which is PC-based. The controller 24 interfaces to the computing processors 6 and passes signals to and from the remote or wireless keyboard 26 associated
- 25 with each television receiver 8. Network computer 28 maintains RF communications with each of the hotel rooms through RF modem 30. The modem

30 and Interface Processing Unit (IPU) 32 form the conversion means 10. Together the modem 30 and IPU 32 perform the necessary conversion from analogue transmission to digital transmission and vice-versa. Each of the IPUs are connected to RF modem 30 through the RF cabling network 12. The IPU 32 in
5 each room connects to the television receiver 8 and to the RF aerial socket. The Internet graphics are displayed on the screen of the receiver 8 and a user may send command signals to access information on the Internet through the wireless keyboard 26, the command signals being sent over an infra-red communications link 34 to the receiver 8.

10 As mentioned previously, the server 18 is a standard personal computer, such as an IBM PC, which typically runs Windows 95 or a Windows NT operating system and which is in communication with ISP 14 via link 20. The link 20 may be one of several types depending on the level of local telecommunications infrastructure but is preferably an Integrated Services Digital Network (ISDN) link that provides
15 minimum Basic Rate Interface (BRI) transmission of digital signals. Two bearer (B) channels are used for data transmission each having a transmission rate of 64 kbps and a delta (D) channel for signalling transmission at a rate of 16kbps. The 2 B and D channels are full duplex in that transmission is bi-directional. The server 18 uses bespoke software which is designed to service the requests by any
20 of the computing processors 6 connected over the Ethernet link 22. The link 20 may alternatively be a leased line with 64K/128Kbps bandwidth, cable TV modem, dial-up forward link and satellite return link or satellite forward and return data paths.

The computing processors 6 are each resource computers, 32 of which may be used
25 as a shared resource for guests of the hotel to access the Internet. However, if demand requires, more resource computers can be installed to allow for future expansion. Each one of the 32 computers are assembled from standard components and comprise 6 Mbytes of memory and 250 Mbytes of hard disk. The number of computers installed depends on the number of guest rooms being served, any

number between 5 and 32 may be used. The computers can be installed in a specially designed metal case forming a metal rack located in a suitable area of the hotel. Each of the processors 6 provide the guest with the graphical user interface of the Internet by using specially developed software to enable the guest to use the Internet and its World Wide Web. The software is bespoke software and is installed in two main pieces, one piece, called "GuestNet Translator Software", is installed in each of the processors 6 and the other, called "Network Controller Software", is installed in network computer 28.

The controller 24 comprises a series of interface cards that each have a central processing unit (CPU) and memory. The controller 24 controls access to the processors 6 and decides which processor 6 can be used, when available, by a particular guest and processes the signals received by the guest through the keyboard 26 to be forwarded on to the assigned processor 6. Similarly the signals or data sent from the assigned processor 6 to be received at the guest's receiver 8 is controlled and processed by controller 24.

The computer 28 is an RF network computer, such as a standard IBM PC, that uses bespoke software, as mentioned previously, to maintain RF communications with all rooms via the modem 30. It also sends and receives data from the controller 24 and for the purposes of billing information it interfaces to the hotel host computer so that the information can be sent to a particular guest. All billing calculations are performed by the network computer 28 through the bespoke software. The user is charged for the period of time he or she has been assigned a channel to use the system, to be described later. The charging or billing can be done for blocks of time such as 10 minutes, 20 minutes or for an hour or whatever period is desired.

The modem 30 is designed to convert digital serial data received from network computer 28 into analogue RF data for transmission over the RF cabling network 12 to each IPU 32. The conversion utilizes frequency shift keying (FSK) as the modulation technique wherein the digital streams are encoded in accordance with

two carrier frequencies so that analogue transmission takes place over the cabling network 12 and be received by IPU 32 and receiver 8. Similarly, analogue RF data transmitted by the IPU 32 over RF cabling network 12 is received by modem 30 and demodulated using FSK so as to convert the data into serial digital data for
5 processing by RF network computer 28.

The IPU 32 is a small unit that is installed in every room having a television receiver 8, and connects between the receiver 8 and the TV aerial socket/outlet in the wall of the guest's room. The physical connection of the IPU 32 to the receiver 8 may vary depending on the design of the receiver 8 and whether or not any
10 existing in-house entertainment is connected to the receiver 8. The physical connection may be to the receiver's RF aerial input, audio/video terminals or to the Scart/Euro connector. Keyboard commands that are input to keyboard 26 by a guest are transmitted over infra-red link 34 and are received by the IPU 32 and converted into RF FSK encoded data and transmitted over the standard RF cabling
15 network 12 to be received by modem 30. The infra-red keyboard 26 is a standard device whilst the IPU 32 has been designed by the applicant.

Thus, only the keyboard commands and control data from the IPU 32 is encoded and sent over the RF network. When the IPU 32 has received instructions on which RF channel processing unit 6 it has been assigned to, then the RF and/or
20 video output from the user's IPU will be switched to match the frequency of computing processor 6, thereby giving the user a direct visual link with the TV RF output from computing processor 6 for the duration of its use.

The system 2 is developed to be compatible with PAL and NTSC television standards and the television receiver screens are a high resolution interlaced 8 bit
25 screen (256 colours) and are designed with careful selection of text fonts for readability on domestic standard televisions. Each receiver 8 is tuned to an available channel of the system using pre-defined keyboard keys. To access the Internet, a guest presses pre-defined keys on the infra-red wireless keyboard 26

available in the room. The television 8 is automatically switched to show the message 'Please wait. Checking service availability' on the screen. At this stage, the system 2 is checking the availability of one of the computing processors 6 and if one of these is free to use, it will be dynamically assigned to the guest room for the duration of the guest's access. The assignment is determined by controller 24. If all the processors 6 are in use, then the guest requiring access will have to wait until one is available. In this situation the guest will be informed that the system is busy. However, it is estimated that in a 300 room hotel, a maximum of only ten users would be accessing the Internet simultaneously so there will more than likely be enough channels available.

After assignment of a processor 6 to the guest, the corresponding IPU 32 for the guest's room is sent the radio frequency on which transmission of graphics will occur, derived from the video output of the associated processor 6. This will give the guest the direct visual and keyboard interface necessary to use the Internet. The system uses a polling method, called Super-Scan and developed by the applicant, wherein each IPU 32 accessing the Internet through the server 18 is polled at a very high speed to transfer all keyboard entries to the remote processor 6 assigned to the particular guest.

The server 18 links each of the computing processors 6 to the Internet 4 so that local network requests that cannot be handled on the INTRANET will pass through to the Internet 4 through the server 18. In this regard, the server 18 has a TCP/IP (transmission control protocol/Internet protocol) stack that supports a connection to the INTRANET via an Ethernet network card as well as a direct or dial-up connection to the Internet 4. The INTRANET network uses unique IP addresses allocated from a band of reserved addresses specifically for private networks. The Internet connection requires an IP address allocated by ISP 14.

In Figure 1(a) there is shown a block diagram of the software components used by the server 18 and the clients or guests. On the server side, the Simple Mail

Transfer Protocol (SMTP) server 21 handles the transfer of mail on the server 18. Customised applications are used to correctly 'bounce' any incoming Internet mail through the Internet connection and to handle usage logging and billing of clients at 27. The Hyper Text Transfer Protocol (HTTP) server 23 negotiates the transfer
5 of HTML pages for guests using the World Wide Web. The server 23 is customised to provide for particular services on offer from a hotel or hospital, such as the Premier Services and for page caching. The Line Printer Terminal (LPT) server 25 provides print spooling for the client systems, which is customised to handle the billing elements and on/off line status information. Billing Information
10 client module 27 interprets data from SMTP server 21 and LPT server 25 to produce a transmission and hard copy request report for each room so that, if necessary, billing to the room guest can take place. Each of the servers 21, 23 and 25 are linked to TCP/IP stack 29. The TCP/IP stack 29 supports a direct connection to the Internet 4 through adaptive driver 31 and Internet connection
15 hardware 33. It also connects to the INTRANET through the Ethernet hardware 37 of the server system of the Ethernet network and through network driver 35.

On the client side of the hotel system software, the SMTP client module 39 enables a user to enter an email message and send it via the Internet 4 from their room. The WWW client module 41 is the HTML page viewer that allows for viewing of
20 the Premier Services and Internet WWW pages. As the main purpose of this module is for Web browsing, the functionality of the module is limited to disable file transfers, if selected. This module handles common JPEG and GIF file formats for images that need to be displayed on screen. The client software includes a TV filter which converts standard PC-based Web page layouts into viewable pages on
25 a standard TV screen. The LPT client module 43 serves as a simulated printer driver that captures printer output and sends it to the server 18 for printing and billing.

Each of the client modules 39, 41 and 43 are linked to TCP/IP stack 45, which in turn is linked to the INTRANET through the ethernet hardware module 49 and

network driver 47. Ethernet hardware modules 49 and 37 for the client side and the server side are also linked so that data can be transmitted and received between the client side and server side. Also, the Ethernet hardware module 49 can be used to connect to other client systems.

- 5 After connection to the Internet is established, the user or guest is presented with a graphical display of web pages, taken from the World Wide Web (WWW), that are customised for the particular hotel, whereby the web pages are framed with a brand logo of the hotel, together with a colour scheme in the background. This gives the guest the impression of a completely separate customised information
10 service provided exclusively by the hotel.

For example, referring to Figure 2, the guest is presented with the Guestnet screen 34 relating to the service provided by the hotel. Several options are given from which the user can choose, such as Premier Services, Browsing the Web, Sending E-mail and a Help button. Selection of a particular option is performed by pre-
15 determined keys on the keyboard 26. The Premier Services 36 is a range of pages identified as being useful to the guest such as information on local restaurants, events, business related information, local information and the weather to name a few. These pages are Internet pages that have been categorised into sub-sections and then framed with the hotel logo and custom toolbar, as seen in Figure 3. To
20 select one of the sub-directories 38 on the Premier Services screen 36 an on-screen pointer is used to highlight the sub-directory in the bullet button 40 located at the left-hand side of the sub-directory name. For example, in Figure 3, local restaurants has been highlighted and therefore may be selected such that the restaurants screen 42 is shown to the user. The selection takes the guest to the
25 restaurant sub-menu. Other home pages, such as business information, travel information, local take-away restaurants and world weather can be selected by pointing the highlighter at the desired sub-directory 38. A branded web page is shown at 65. A navigation system is provided for navigating the user through the options on the Premier Services Menu 36. Up button 51 and down button 53,

respectively, move the user up and down the bullet buttons 40. Forward button 50 takes the user to a web page of the selected option 40 while the back button 52 returns the user to the previous page. A clock and/or on-screen timer 56 is also provided. Help button 44 will forward the user to information on how to use the
5 system in relation to the Premier Services screen 36. Depressing the quit button 46 will return the user to the previous menu, in this case to the Guestnet screen 34.

In Figure 4, there is shown a web page relating to a particular sub-directory of the Premier Services, such as a restaurant in which details are provided on that restaurant. The screen 48 has a page browser for navigating the user through the
10 screens and pages similar to the navigation mechanism shown in Figure 3. The navigation may, in addition to using keys on keyboard 26, be carried out by using a mouse interface which is supplied as part of the keyboard 26. In particular, the browser has forward and back buttons 50 and 52 respectively for moving among the pages and up and down buttons 51 and 53, respectively, for moving up and
15 down the current page. The buttons 51 and 53 are highlighted to indicate that the page can be moved in that direction. A print button 54 is available as an option, where a printer can be enabled through server 18 by a system administrator, to print the current page for details on the restaurant. When selected, the guest will be presented with a question confirming whether or not the guest wishes to proceed
20 with the print, and if accepted the page(s) will be printed out and delivered to the guest's room.

An optional on-screen timer 56 is displayed by the browser to inform the guest as to how much time has elapsed for the current Internet accession. It may also function as a clock. This option is set by the system administrator and is displayed
25 for the whole system. Help button 58 and quit button 60 have the same functions as previously described.

Referring back to Figure 2, if a guest wishes to browse the WWW the appropriate directory is chosen from the Guestnet screen 34. After this selection, a typical

screen will be shown at 62, seen with reference to Figure 5. Like buttons in relation to Figure 4 are shown again and have the same functions as described in relation to Figure 4. The Web browser includes a directory accessible search tool, such as "lycos" or "yahoo", that can be used to search for a particular web site (URL). The web site requested to be searched is entered in box 64 and the search option button 66, designated by "?", is depressed to retrieve the web site through web search engine 63. This web site may be requested from the ISP 14 directly, however commonly accessed web sites may be stored at server 18 to forego the expense and time needed to go to the ISP 14, as will be explained later. The addresses for the required search site are set via an administration utility, to be described later, on the web server. A built-in customised version of yahoo can be called up which is set by the system administrator. An IMAGES (GFX) button 55 is provided to allow the user to switch-off the in-line graphics on each page download so as to have faster access to the web sites or through the pages.

15 To allow a guest to navigate efficiently forwards and backwards, during a session, through commonly accessed web sites, local storage at the server 18 of say of the last 20 accessed web sites is provided for. In this way, a request for web pages at a particular web site goes to server 18 first and if the page already exists, or is stored there, it will be sent from server 18 instead of ISP 14. After exiting a session and/or after a timed period of inactivity from the guest, these sites will be cleared so that another guest, with a new accession, will start with a clean system.

A guest who wishes to send electronic mail or e-mail to an established e-mail address locally or worldwide can select "e-mail" directly from the Guestnet screen 34, in Figure 2, which produces the e-mail editor screen 68 as shown in Figure 6.

25 On entry into the e-mail editor the user will see existing message text, which cannot be edited, automatically appended to their e-mail message such as hotel name and contact numbers. This information is picked up from the PC administrator module as it is determined by the administrator, which may change on a system by system basis. If a guest already has his or her own e-mail in

another country, or another part of the country, the user is asked to enter their address and user name for their e-mail POP server. On successful connection with the remote POP server, the guest enters a password to access the account and download any unread e-mails for display.

- 5 The e-mail system will initially request the name and room number of the user upon which the user enters the information wherein it can be added to the message header when sent. The name of the recipient is typed into box 70, any names of recipients requiring a copy of the e-mail is typed in box 72, the topic in box 74 and the text message in window 76. All of the information is entered into an on-
- 10 screen display that utilizes an appropriate font for television. The e-mail editor has up and down buttons 51 and 53, respectively, which allows the current page to be scrolled up and down and this is an accelerated scroll over time. If there is no more page to move to, i.e. the user is at the top or bottom of the page, the corresponding up or down button 51 or 53 will be ghosted and non-selectable.
- 15 After completion of inserting the message text, the "POST" button 78 is depressed to send the currently edited message. An e-mail logo animates during the sending of an e-mail message to show that it has actually been posted. The e-mail transmit system automatically appends a message stating who the sender of the message is and from which room number of the hotel. The e-mail editor screen 68 will then
- 20 be exited and the user will be returned to screen 34. Quit, print and the session time buttons respectively denoted by 60, 54 and 56 have the same functions previously described. Help button 58 displays a help page for the main menu explaining how to use the system including billing information.

- By depressing INBOX button 77, the user will be taken to email inbox screen 79
- 25 where all mail received may be read. On entry into the INBOX email reader, the user will see the first of their pending and unread messages, which cannot be edited. Left and right arrow buttons may be used to move from one message to another if there is more than one unread message. Up and down arrow buttons are used to scroll up and down through the text of an email message. If the user

wishes to send a reply to the sender of a particular message, a REPLY button is depressed. This will take the user back into email editor screen 68 where the text from the original message will be placed in window 76 ready for the user to add their own text before depressing the POST button 78 to reply to the message and send it off. The original sender's email address is automatically inserted in TO box 70. The user or guest can forward a message to another e-mail address by depressing the FORWARD button which will take the user back to email editor screen 68 with the body of text to be sent, to which new text can be added. The forwarding address will need to be entered in TO box 70 before depressing POST button 78. The help button 58 displays a help page for the main menu explaining how to use the system including billing information. The quit button 60 returns the user to the e-mail editor screen 68 to continue where he/she left off.

Figure 7 shows a schematic diagram of the administration software implemented in server 18. On starting up the software, and at times when the system is not having modifications to its administration, the Guestnet start-up/status screen 80 is displayed. The ADMIN button 82 may be selected to access five administration modules through which changes to the system's operation can be made. A password must be entered at box 84 to gain access to the modules in administration screen 86. When the administrator has finished making the necessary changes and/or updating of the modules, a finish button 88 can be selected to exit screen 86 and return to screen 80. When the administrator wishes to exit the system altogether a close button 90 is selected and password entered at 92 and the exiting action confirmed at 94. A help screen 44 is available from either the Guestnet start-up/status screen 80 or the administration screen 86.

The five administration modules are as follows:

- (1) General Admin Module
- (2) Web Admin Module
- (3) Premier Services Admin Module

- (4) Email Admin Module
- (5) Status Display Admin Module

Each module will now be described with reference to Figures 8 to 12.

Figure 8 shows a schematic diagram of a General Administration Module screen
5 96. This module allows the setting and changing of many of the global system parameters.

The help button 98 gives access to a help window providing the administrator with assistance on the current module. The undo button 100 undoes the last change made to any of the current module parameters. In box 102, the administrator may
10 change the password by typing in a new password and verifying it in the boxes provided. The system is designed to revert back to screen 80 if, after a pre-determined period of time, the administrator does not input any data or make changes. This is so that the system is not left in a vulnerable position should the administrator not be present to use the module.

15 Guest selections of preferred web sites, or the most accessed web sites, can be logged at the option of the administrator at box 108. A simple on-off toggle switch 110 specifies whether the system should or should not log the guest's selections and build a web site preference log. A print of a selection of guest's logs can be obtained or simply viewed on-screen. A reset button 112 is provided to
20 delete current web site preferences logs and start a new one within a specified time, say 30 days. If this is not done manually, the system automatically updates this every 30 days. The web site preference logs assist the administrator in deciding which web sites should be stored at the server 18 so that the ISP 14 does not have to be accessed every time a particularly popular web site is requested.

25 The hotel details can be entered in box 111 such as name, address (including e-mail address), telephone and fax numbers and a contact number for a person

administering system support. The Internet Service Provider's details are entered in box 113 including name, a contact number for technical support in the event of system difficulties, address (including the Internet Protocol address at the ISP for Internet access), and a dial-up number for the ISP if required.

- 5 System parameters such as time and date can be entered into, or corrected in, box 114 or these can be automatically set from the ISP's time server for which a toggle button is provided.

In box 116 there is a provision to terminate a guest's accession after a predetermined period of inactivity on the part of the guest. An on-off switch 118
10 is also provided to inform a guest of how long they have been using the web browser or Premier Services, which may be charged on a per minute basis.

As mentioned previously, the guests can print hard copies of a web page or an e-mail transmission. This function will be optional and can be switched on or off by the administrator depending on the logistics of billing and printing at each hotel.
15 When this feature is switched off, the print option will not appear on the guest's screen. A reason for switching it off is that the particular hotel may not have the infrastructure to handle such print requests as access to a printer, and subsequent delivery of the hard copy to the rooms, may be difficult.

The World Wide Web administration module 120, shown in Figure 9, handles the
20 settings for standard Web browsing. Through the downloadable file filter typebox 122, the administrator can control what file types the browser can download and this can be updated at any time. For example in window 124, source file types such as .MPEG, .LHA and .LZH are prevented from being downloaded, whilst in window 126, destination file type .JPG is available for downloading. To transfer
25 file types between the two windows 124, 126 arrow buttons 128 and 130 are used. Files over a specified size, measured in Kilobytes, may be prevented from being downloaded, or are filtered out, by using button 132. As mentioned hereinbefore,

each browser of the processors 6 will need access to a directory of pre-stored web sites, entered into and stored on server 18 through the administration utility. To assist in the administration set-up of these sites, a logging function reports on which sites have been accessed the most during, say the last month, so that any popular sites that do not currently exist in the pre-stored directory can be added manually by the administrator. The storing of the web sites is updated automatically when server 18 is in idle mode, that is, not serving any of the individual processor browsers. Therefore a request for one of the web sites will be received by the server 18, assuming it is one of the pre-stored web sites, instead of connecting to the ISP 14 to access the web site.

A current list of popular sites (URL), which may comprise up to 200 locally cached pages, may be inserted into the local cache list box 134. The list may be compiled by the administrator from browsing the WWW in real-time and selecting pages to add to the list or insert into the list (depressing button 136 - "adding from browse"), or adding sites from the log available from the active logging option 108 in relation to Figure 8 (depressing button 138). In box 140, the current page or web site selected from the list is shown. To view a selected page, the administrator may depress button 142 and to remove a page from the list of local caches the button 144 may be depressed.

The local cache listing is updated regularly by connecting to the ISP. Whenever the system has been idle for more than 15 minutes every page in the cache is refreshed. If it cannot be updated because there has not been an idle period, a forced update will occur, set to 3 a.m., to ensure the pages are never more than 24 hours out of date. However, the regular updates may impact system performance on busy systems, so an option to refresh at a particular time is available, via refresh cache box 146. Buttons may be depressed in box 146 to enable refreshing when the system is idle, at a particular time or for specified time intervals. By setting a default of 3 a.m. this is a time when the system is least likely to be used by guests. Alternatively, each page can be refreshed every hour or after a certain period of

time has elapsed. This option may be useful when the cache is full of fast changing data which may need to be updated more than once a day. A default time of six hours is recommended if using this option. A built-in custom search page option is available in box 148 for an administrator to allow for quick searching of a particular web page, the details of which are entered in the URL box provided, required to be added to the cache list or to view.

Figure 10 shows a schematic diagram of a Premier Services Administration Module screen 150. Box 152 lists the directories or categories available in the Premier Services menu such as world weather, restaurants, business information, general interests, night clubs, local information and take-aways, from which a guest can make a selection. The categories are determined and entered by the administrator using ADD button 154 and may be removed using button 156. The currently selected category is shown at box 158 and may be changed to another name or another category by typing over the existing category name. Each category that is selected from box 152 displays the associated web pages in the current pages box 160. When a category is removed, its associated web pages will also be deleted. The category "Restaurants" has been selected in the Figure and the associated restaurants are displayed on the right-hand side in box 160 with "La Casa Mia" being the presently assigned/selected restaurant. The administrator can then be taken to the appropriate home page, via the correct URL, for "La Casa Mia". If another web page needs to be added or deleted from box 160, buttons 162 and 164 may be respectively depressed. An existing tiled web page background image may be replaced with a branding logo, however, because many web pages also utilise the background for branding, there needs to be a switchable page by page facility so that particular web pages can have their own branding logo. This facility is invoked by using the toggle buttons 168. When a button 168 is depressed, a file requester will appear prompting for the tile image to be utilised. The 'TILE ALL' button 166 automatically adds the selected tile file to all pages in the current directory.

In Figure 11, there is shown a schematic diagram of the e-mail administration module screen 170. This module handles all of the administration tasks relating to guests sending e-mail messages. Footnotes may be added to e-mails transmitted displaying a message, such as the one shown in box 172. For example, the
5 particular message displayed reads "WARNING. Please note if you reply to this e-mail it will be sent to the guest address below and then forwarded to the room, if you wish to contact the sender please telephone xxxxx, fax xxxx or e-mail xxxx@xxx.xx.xx." Text can be added by an administrator, primarily used to notify recipients of e-mail that they cannot respond to as the response may not reach the
10 sender. This message would only be appropriate until such time as e-mails are able to be answered in reply.

The Message Auto Append facility 174 allows the administrator to append the sender's name and room number to a message and to automatically print a hard copy of each e-mail sent, using the respective buttons shown in box 174, for
15 verification purposes only. The appropriate toggle button for auto print is usually switched off for confidentiality of the message. If there is an option for a guest to request a print, this will be in addition to the auto-printed hard copy.

There will be situations when a message sent by a guest will not reach its intended destination, possibly due to an incorrect e-mail address being entered or problems
20 with the server. In these cases, the ISP 14 bounces the message and returns it to the sender with information as to why the message never made it to its destination. In Bounced Message Handling box 176 certain options dictate how the system handles bounced messages. Such messages can simply be ignored by switching on button 178. By toggling switch 180 on, a print-out of information relating to the
25 bounced message can be given to the sender to alert them to that fact allowing them to make alternative arrangements. The autofile button 182 files all bounced messages to be called up for verification purposes by the administrator. The files will automatically be deleted after 30 days have expired. The file list currently storing all bounced messages may be viewed on-screen or printed by an

administrator using buttons 184 and 186, and clear the 30 day old messages by using button 188.

Figure 12 shows a schematic diagram of a Status Display Administration Module screen 190. This module handles the display preferences for the start-up/status screen so that the options are displayed on a default screen. The status display options, which are switched on or off through the buttons shown in box 192, include the following:

- current cache activity to indicate, graphically, whether or not a particular web page cache is being accessed;
- 10 - current connection activity to indicate, graphically, whether or not the leased line or ISDN line is passing data;
- the time elapsed since a guest used the system;
- system time and date. If these are incorrect the administrator can change them in the administration module;
- 15 - the time and date of the last entry in one of the modules by the administrator;
- the name of the last active system administrator; and
- a display of the number of web pages or Premier Services accessed in the last hour, day, week, or month, providing an indication of system usage.

**Claims:**

1. A telecommunications system for providing a plurality of users access to an information source, said system comprising:
 - a plurality of computing processors linked to said information source through
 - 5 server means;
 - said server means receiving and transmitting digital data between said information source and plurality of computing processors;
 - conversion means for converting digital data into analogue data for transmission and reception over a television cabling network, and vice-versa, and
 - 10 television receiver means for graphically representing said analogue data so as to visually present information from said information source to the user;
 - said cabling network linking individual television receiver means; wherein access to said information source is provided on a shared basis and one of said processors is assigned to each user on the system for manipulating the information
 - 15 and providing the user with the graphical representation of said information.
2. A telecommunications system according to claim 1 wherein the server means is linked to said information source through a service provider.
3. A telecommunications system according to claim 1 or claim 2 wherein the server means transmits to, and receives from, each one of said plurality of
- 20 processors that are in use, information represented by said digital data.
4. A telecommunications system according to any previous claim wherein controller means is connected between said plurality of computing processors and said conversion means to control access by the users to the computing processors by assigning said access on the basis of availability of the computing processors.
- 25 5. A telecommunications system according to any previous claim wherein each user has access to a television receiver means linked by the cabling network to

interact with or manipulate said information.



6. A telecommunications system according to claim 5 wherein the user interacts with the visually presented information through a remote keyboard by entering data using keys of the keyboard.
- 5 7. A telecommunications system according to claim 6 wherein the controller means processes data entered into said remote keyboard and forwards the processed data to an assigned computing processor and processes the data transmitted from said assigned computing processor to the associated user's television receiver means.
8. A telecommunications system according to claim 6 or claim 7 wherein said
10 remote keyboard is linked to said television receiver means by infra-red communications.
9. A telecommunications system according to any previous claim wherein said conversion means comprises a modem and an interface processing unit associated with respective television receiver means, said conversion means interfacing each
15 television receiver means with one of said plurality of processors.
10. A telecommunications system according to claim 9 including a network computer connectable between said controller means and said modem of said conversion means to maintain RF communications with each individual television receiver means through said modem.
- 20 11. A telecommunications system according to claim 10 wherein said modem converts digital serial data from said network computer into analogue RF data for transmission over the television cabling network to each interface processing unit associated with respective television receiver means and said modem converts analogue RF data transmitted by the interface processing units into serial digital
25 data for processing by the network computer.



12. A telecommunications system according to claim 11 wherein each interface processing unit is connected between respective television receiver means and its associated aerial socket/outlet.
13. A telecommunications system according to any previous claim wherein said
5 server means stores commonly accessed portions of said information source so that when a user requests access to information that corresponds to one of said stored portions, the server means retrieves said one of said stored portions for use by the user instead of accessing the information source directly for the requested information corresponding to the stored portion.
- 10 14. A telecommunications system according to any previous claim wherein said server means is linked to said plurality of processors through a local area network.
15. A telecommunications system according to any previous claim wherein said information source is the Internet.
16. A telecommunications system according to any previous claim wherein said
15 system is compatible with PAL and NTSC television standards for graphically displaying said information on said television receiver means.
17. A telecommunications method of providing a plurality of users access to an information source, said method comprising the steps of:
- transmitting and receiving digital data between said information source and
20 a plurality of computing processors through server means;
 - converting said digital data into analogue data, and vice-versa, for transmission and reception over a television cabling network;
 - visually presenting to a user said analogue data on television receiver means, representative of information supplied by said information source;
 - 25 wherein access to said information is provided on a shared basis and each user has an assigned computing processor to manipulate said information, under the



control of the user, and to visually present the information to the user on said television receiver means.

18. A method according to claim 17 wherein a service provider is linked between said information source and server means to transmit and receive said digital data, representative of information received from or transmitted to said information source, wherein said server means processes the information between the service provider and each one of said computing processors that are in use.

19. A method according to claim 17 or 18 wherein said television cabling network links individual television receiver means.

20. A method according to any one of claims 17 to 19 further including controlling access by said users to said computing processors by assigning said access on the basis of availability of the computing processors.

21. A method according to claim 20 wherein each user has access to a television receiver means linked by the cabling network to interact with or manipulate said information.

22. A method according to claim 21 wherein said interaction or manipulation of the visually presented information is performed by using a remote keyboard and entering data using keys of the keyboard.

23. A method according to claim 22 wherein the controlling step includes processing the data entered into said remote keyboard and forwarding the processed data to an assigned computing processor and processing data transmitted from said assigned computing processor to the associated user's television receiver means.

24. A method according to claim 22 or claim 23 wherein said keyboard is linked to the television receiver means by infra-red communications.



25. A method according to any one of claims 17 to 24 wherein said conversion step uses a modem and an interface processing unit associated with respective television receiver means and said conversion step interfacing each television receiver means with one of said plurality of computing processors.

5 26. A method according to claim 25 further including maintaining RF communications with each individual television receiver means through said modem.

27. A method according to claim 26 wherein said modem converts digital serial data into analogue RF data for transmission over the television cabling network to
10 each interface processing unit associated with respective television receiver means and said modem converts analogue RF data transmitted by the interface processing units into serial digital data for further processing.

28. A method according to any one of claims 17 to 27 wherein said server means stores commonly accessed portions of said information source so that when
15 a user requests access to information that corresponds to one of said stored portions, the server means retrieves said one of said stored portions for use by the user instead of accessing the information source directly for the requested information corresponding to the stored portion.

29. A method according to any one of claims 17 to 28 wherein the information
20 source is the Internet.

30. A method according to any one of claims 17 to 29 such that the information visually presented on said television receiver means is arranged to be compatible with PAL and NTSC television standards.

31. A method according to any one of claims 17 to 30 wherein said server
25 means is linked to said plurality of computing processors through a local area



network.

32. A telecommunications system for providing a user access to an information source, said system comprising:

5 a computing processor linked to said information source through server means;

said server means receiving and transmitting digital data between said information source and said computing process;

10 conversion means for converting digital data into analogue data for transmission to and reception from a television receiver means for graphically representing said analogue data so as to visually present information from said information source to the user wherein the user is able to interact with or manipulate said information.

This Sheet Has Been Replaced



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REPLACED