WarpDoctor Project
Site Design
Revision 2

March 15, 2003

WarpDoctor Goals

The WarpDoctor project is a volunteer group of VOICE members striving to achieve the following goals:

- Provide information about hardware compatibility with OS/2 Systems and how to install hardware.
- Provide information about software compatibility, installation, and tips on operating various software applications.
- To be a repository for OS/2 related documentation, manuals and publications.
- To be a repository for OS/2 drivers, software applications and related utilities.
- Whatever software is designed and used in the web site will be available to the OS/2 community.

These goals will be accomplished by creating a system for the storage of information and files, and the dissemination of that information to the OS/2 community. The main interface from the OS/2 community to WarpDoctor will be through the web site located at www.warpdoctor.org. A secondary interface to the information stored in the WarpDoctor site will be through FTP, both to anonymous users and through links from the HTTP (web)-server.

Web Site Design Objectives

The WarpDoctor web site will be the primary interface to the WarpDoctor project. The site is being designed with the following objectives and assumptions:

- The site must be accessible using all OS/2 based browsers - from WebEx to the latest version of Mozilla.
- While the site is aimed at OS/2 users accessing the site from OS/2 based browsers, the site must also be accessible from browsers running on non-OS/2 operating systems.
- It is assumed that the majority of the users will be connecting with dial-up type connections, i.e. the site must be responsive using low speed connections.
- The data must be organized so that user can find information either by navigating through the site or by using a search feature.
- It is anticipated that the majority of the site content will be entered by the OS/2 community, meaning the users of the site. The site must be designed to facilitate content entry by the user for all the types of content stored in the site.
- The site must be designed to minimize maintenance requirements by the WarpDoctor staff.
- The site will be mirrored; an automated method of maintaining the data on all mirrors must be implemented.

User Perspective - What the Site Looks Like

The site is designed to look to the user like a file system with folders and files. The file system metaphor is well understood by most users thus helping them feel comfortable with the site. The content or data of the site in stored in "files", files are stored in folders. A folder can contain both files and other folders. Note that both the "folders" and the "files" are actually stored in the database, the exception being items that must be accessible via FTP are stored in disk files that are monitored by the database.

There are potentially three different viewing formats which can be used when accessing the site by browser:

1. A single screen format, where everything appears in one screen.

2. A split screen with the navigation part, the "folders", in the left side and the content displayed in the right side.

3. A dual screen format with the navigation part in one screen and the content displayed in a second screen.

The split screen and dual screen formats both require the Rexx Plug-in and will only work on OS/2 based browsers. The single screen format will work with all graphical browsers on all operating systems. Users accessing the site through a browser with the Rexx Plug-in installed can chose the view format using their User Settings.

Single Screen

The single screen format is for browser that don't support the Rexx Plug-in, users that do not want to install the Rexx Plug-in, and users accessing the site from operating systems other than OS/2. All interaction happens through a single screen with no forms. It is the simplest and most traditional of the three viewing formats.

Screen shot TBD
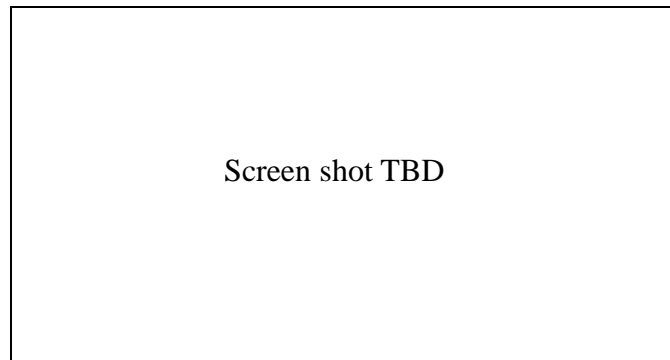
Split Screen

The split screen format requires the Rexx Plug-in in order to run. The folders appear in the left side and folder contents and site content appear in the right side. The split line between the left and the right sides can be

adjusted, and the location of the split line will be saved from session to session, if configured in the User Settings. A toolbar appears at the top of the screen, which is described in "Toolbar" on page 4.
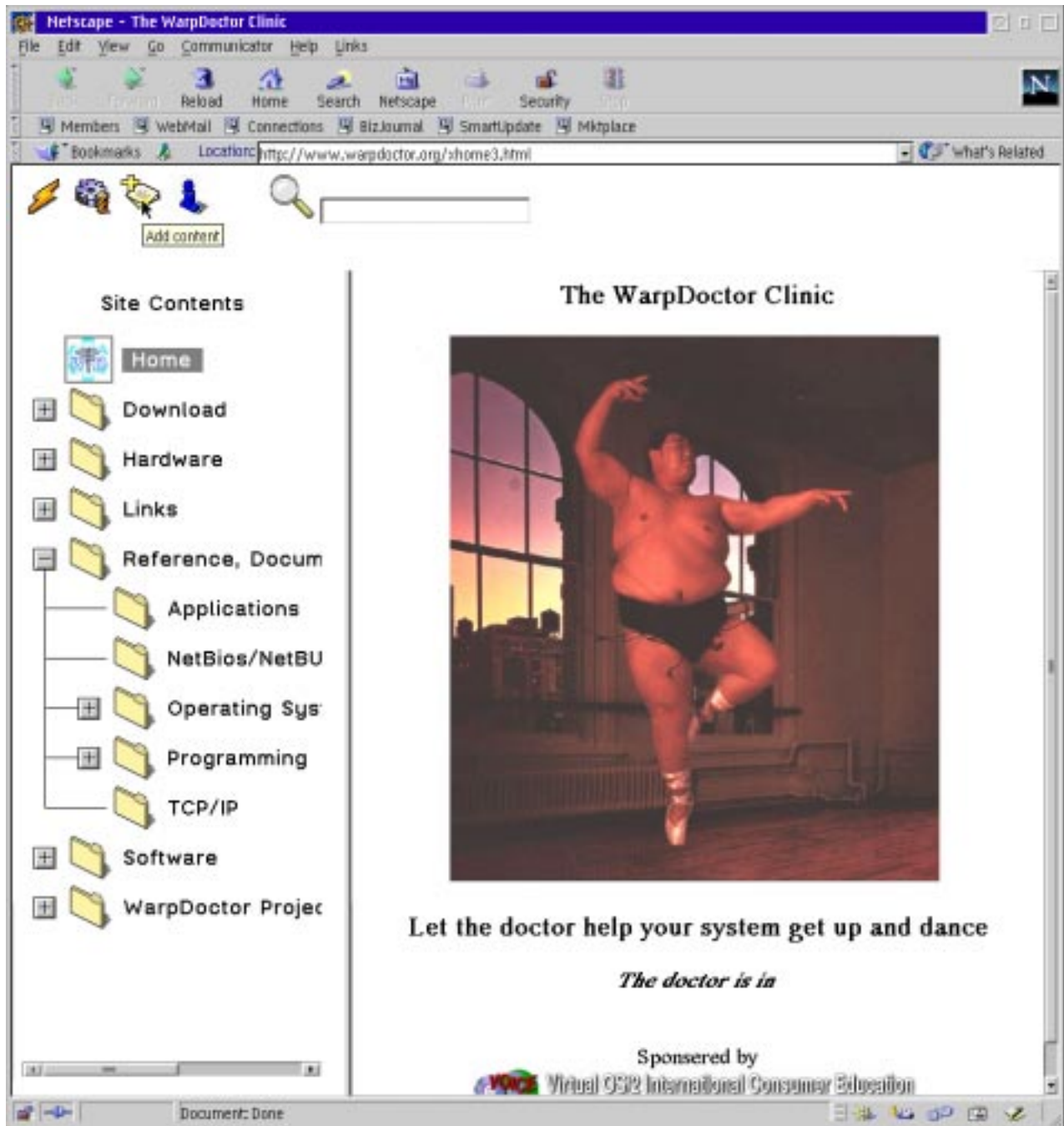
Two Screens

The two screen view format requires the Rexx Plug-in. This format displays the folders in one window and the content items in the second window. The second window is updated from what is selected in the first window.
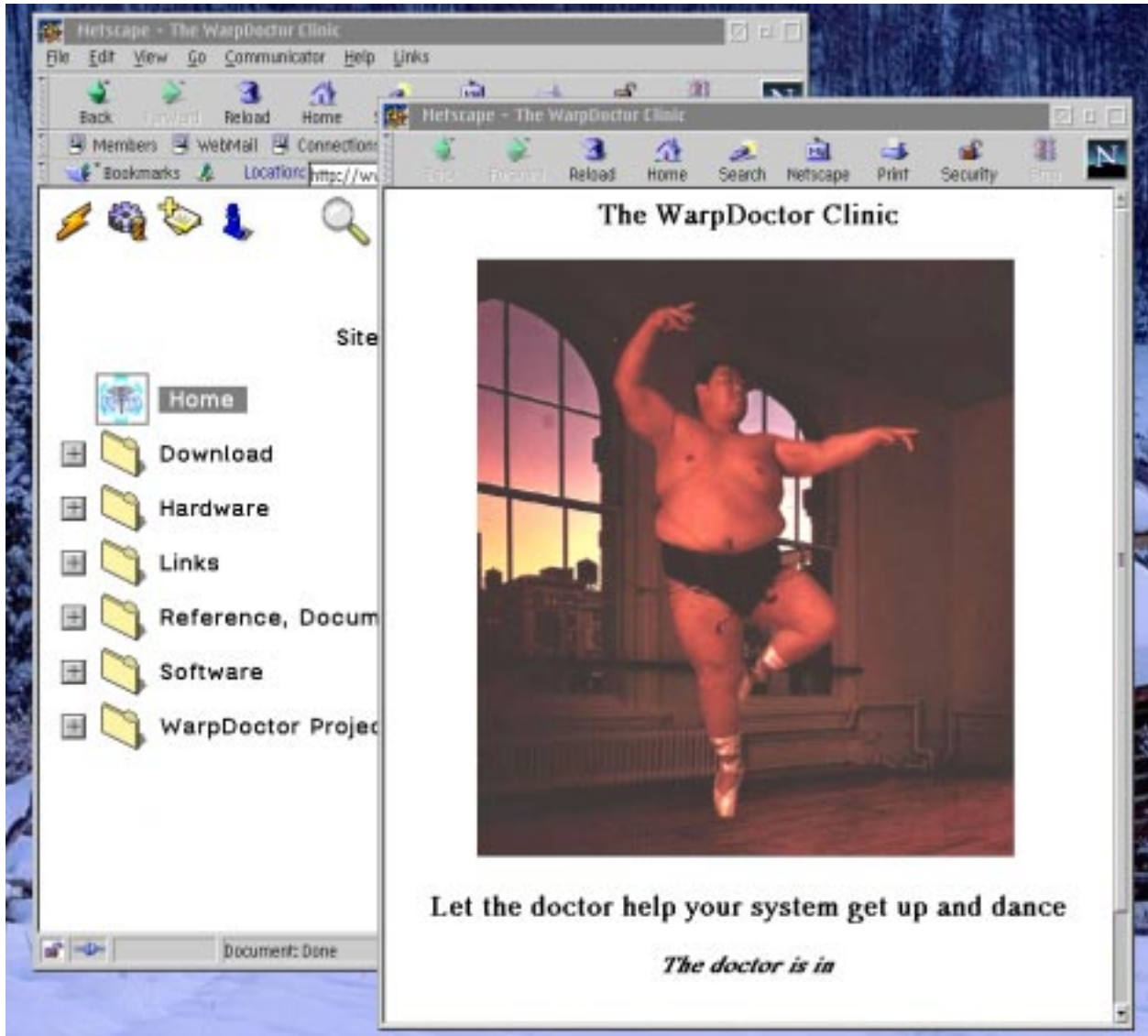
Adding Content

The site will be designed so that users in the OS/2 community can add and change the content contained in the site. There are a number of different methods which can be used for entering content. The type of method that can be used depends on the type of content to be input, the type of browser being used, and whether the Rexx Plug-in is installed to the browser. See "Types of Content" on page 6 for the types of content stored in the site.

- All information can be entered via email to a special email address. Binary data that is part of the content must be attached to the email message. WarpDoctor staff members monitor the email address and enter the information into the site from the mail message and attachments.

- Users connected with OS/2 browsers that have the Rexx Plug-in installed can enter and alter all content types and perform all data manipulations possible on the site.

- Users connected with browsers that do not have the Rexx Plug-in installed can enter hardware and software compatibility information which does not contain any embedded graphics or drivers. They can also alter or delete existing information, shadow a content item to another folder, or create cross references to other content items.

User IDs and Logon Process

While information can be entered by any user, only the user that originally entered the information can change the information, and then only for a limited time; the amount of time is configured in the Site Settings. This restriction prevents the site from being damaged by malicious users deleting or altering data. The update and delete restriction is accomplished by a user ID and password system. Each user is assigned a user ID and password. This user ID is attached to the content and the system prevents any user from altering the content unless the user ID matches.

Users create their own User IDs and passwords by selecting the New User tab or link.

If a user is not logged on and selects Add Content, then the logon screen is presented before the add content screen.

Single Screen - No JavaScript

TBD

## Split and Dual Screen - Rexx Plug-in

When using the split screen or two screen mode you can add content a number of different ways:

1. By dragging a file onto a folder.

2. By dragging one of the WarDoctor content templates onto a folder.

3. By clicking the Add Content icon in the tool bar.

4. By right clicking with the mouse in the folder area and selecting Add Content from the pop-up menu.
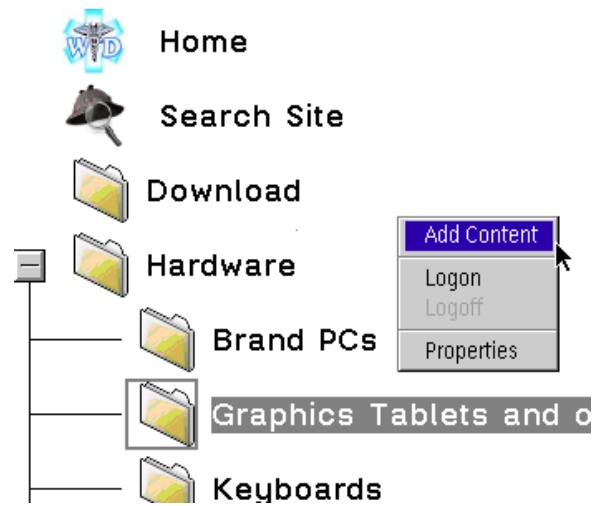
The folder that is currently selected will be where the content item is placed, regardless of the method used to start the add content process. When the add content process starts, a data entry/data edit screen appears appropriate to the type of content being added.
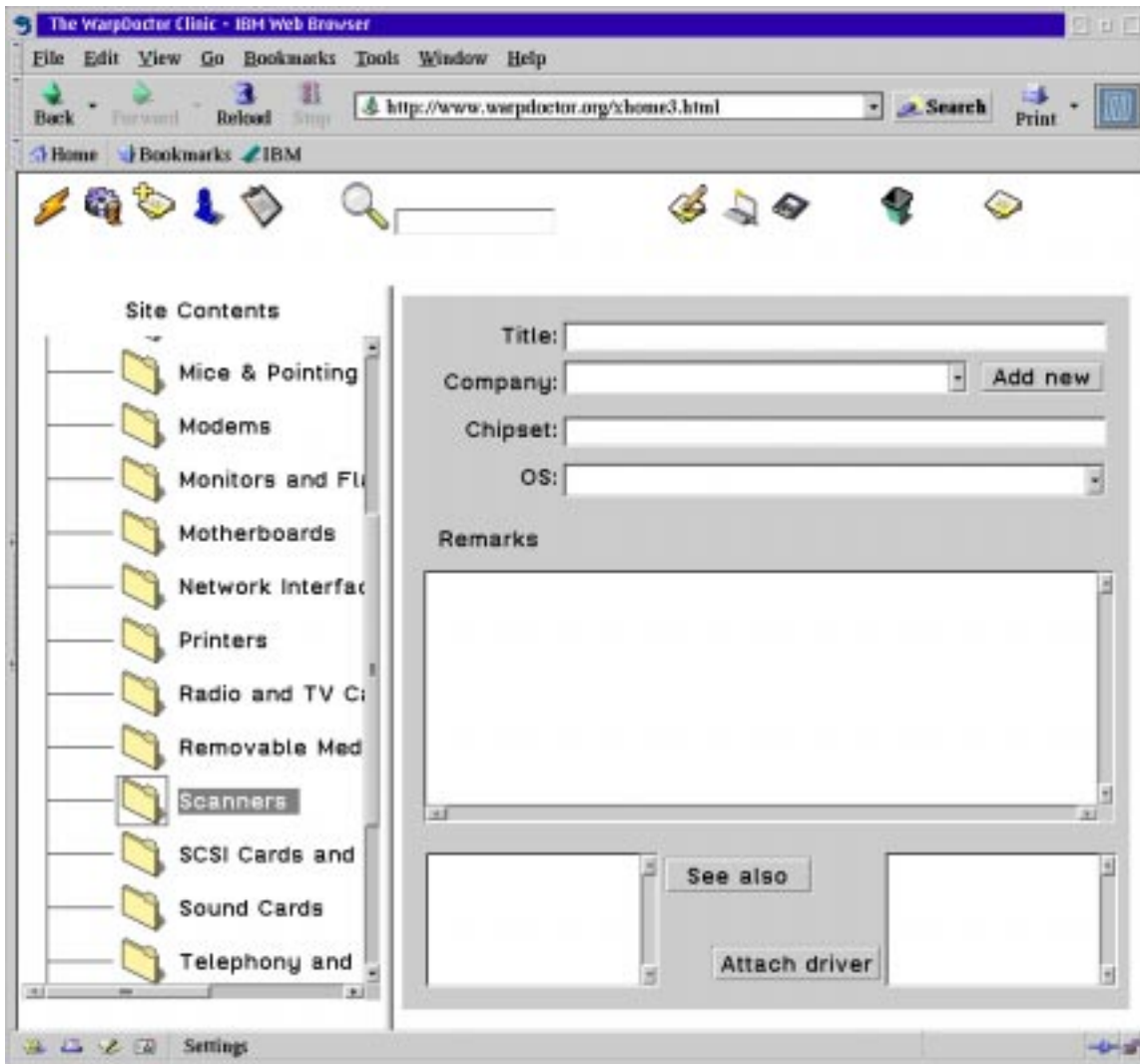
In add or edit mode additional icons appear in the toolbar at the top of the screen. The additional icons are (left to right)

- Edit content.

- Preview - clicking this opens a new browser window where the content item can be previewed.

- Save - saves the content item to the database.

- Delete - deletes the current item.

- Item icon - this can be used for drag and drop. The icon can be dragged to a folder to move the item to that folder, Ctrl-Shift dragged to another folder to create a shadow of the item in that folder, dragged to another Content item to create a See Also link that item, dragged to the Save icon or Delete icon to be saved or deleted. Finally the Item icon can be dragged to the clipboard icon to be copied to the clipboard.
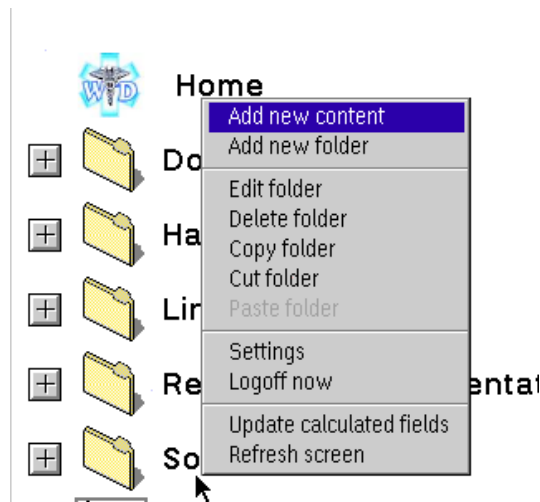
The Clipboard, Edit, Delete, and Item icons appear in the toolbar when the user is logged on to the site and the user is viewing an item that he entered, i.e. an item flagged with his user ID. When the user has logged on the site an additional item also appears in the pop-up menu for the folders. The additional item is Show Empty Folders. When selected all the folders in the Folders table are displayed in the folder container; the normal mode is to only show folders that have content stored in the folder or children folders. Since content is associated with a folder by selecting the folder before clicking the Add Content icon, the user must be able to see the empty folders in order to add the first content item to an empty folder.

Site Administration

There is a special category of users called Site Administrators. These users have special privileges which allow them to modify any content item, and to add, move, and delete folders. Please note that site administrators are not the same as system administrators - site administrators only have access to these additional functions in the web site, not to additional functions on the server.

When a user with Site Administration privileges logs onto the site he has additional icons, pop-up menu options and drag and drop capabilities.

1. An Add Folder icon appears in the toolbar.

2. The pop-up menu includes selections for adding and editing folders.

Home
Add new content
Add new folder

Edit folder
Delete folder
Copy folder
Cut folder
Paste folder

Settings
Logoff now

Update calculated fields
Refresh screen

3. Folders can be manipulated by standard drag and drop actions: folders dragged to other folders (move or copy), the clipboard icon, or the Delete icon. In addition the Clipboard icon, if the clip has any contents, can be dragged to a folder to paste the contents into that folder.

Users with Site Administration privileges can also change the folder title by Alt-clicking on the title and typing a new title. They can also change the folder display from Tree view to Details view. This can be done from additional pages that appear in their Settings notebook. When in Details view mode folders can also be moved by changing the value of their Parent field. The Code value can be changed. And the full drag and drop capabilities exist. The Details view mode can be run in outline format where the user can expand or collapse a branch of the

structure, or where all the rows in the Folder table are displayed. See "WD Editor" on page 19 for details on how the editor works.
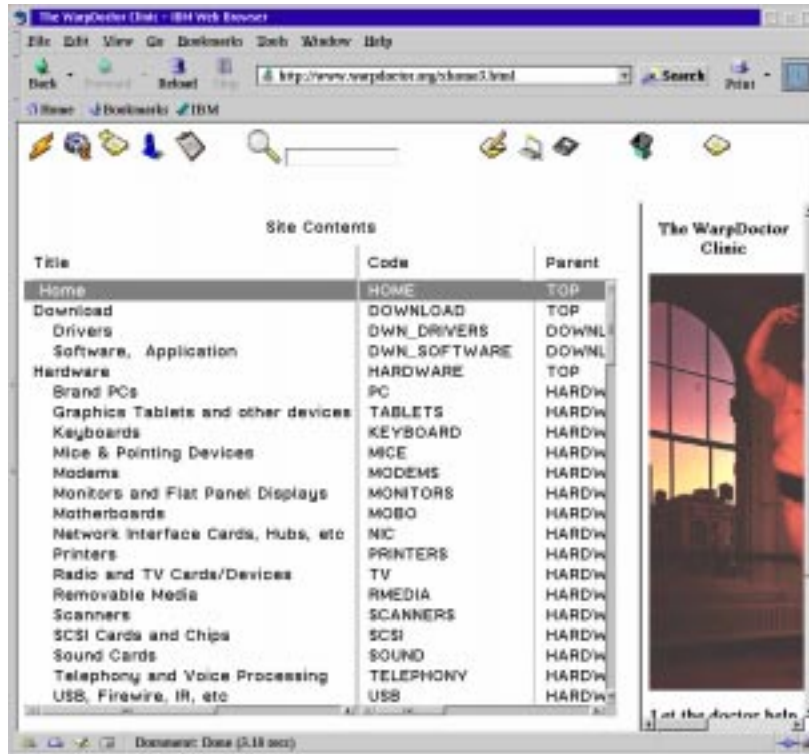
How it Works

Data is stored in a database and in disk files. Generally speaking informational data is stored in the database and software is stored in disk files. The disk files are linked to the database and "served" by the web site CGI programs through the FTP server. Storing large binary files as disk files rather than database blob rows has three advantages:

1. Streaming binary data is more reliable using the FTP protocol than the HTTP protocol. This is shown by the problems web sites around the world have in downloading WarpIn packages.

2. Using FTP to transfer large files allows the transfer to be restarted if the connection fails before the transfer is complete.

3. It allows an FTP interface to be used for downloading files, for those users that prefer this type of interface.

When data is stored in disk files, a two way link between the file and the database is established.

1. The file name is stored in the Content item, which allows the database to serve or reference the file.

2. The CONNUM value of the associated Content item row is stored in an extended attribute of the file.

The File Synchronizer utility, which is run periodically, checks the links between Content items and files on disk.

The database used by WarpDoctor is IBM's DB2/2 version 5.2. The database provides good performance and an extensive feature. The components of the site are built to run either directly against the DB2 command level interface (CLI) or through an ODBC, which allows other databases to be substituted if needed. The exception to this is the WarpDoctor Editor, which when running in stand-alone mode only uses the DB2 client Rexx interface; when running in Plug-in mode it can edit data in any ODBC enabled database.

Types of Data

The data stored in the site is described by two different "types" and an encoding.

1. The **MIME Type** describes the format of the data, for example: HTML, JPG, PDF, ZIP, etc.

2. **Encoding** describes any compression or encryption that is applied to the data. The only encoding supported by the WarpDoctor site is **gzip** style compression. Encoded (compressed) data is different than a MIME Type of application/x-compress or a file with an extension of ZIP, in that the encoded data is decoded by the browser before being displayed or passed to a helper application or plug-in. Data with compression MIME Type (application/x-compress for example) are not decoded or decompressed by the browser.

3. The **Content Type** describes what the data is, or the category the data falls into. Contents include: hardware compatibility description, driver software, manuals, application help, etc. The content type determines where the data is stored, and the input screen and output format web page(s) containing the data.

MIME Types

The MIME Type describes the format of the data. It is analogous to a file type. The following table lists the MIME Types transmitted by the site.

TABLE 1. MIME Types Handled by the Site

MIME Type	Extension	Description
text/html	HTML	Formatted HTML
plain/text	TXT	Used for meeting logs, read me type files, etc.
application/postscript	PS	Postscript documents. These are stored in both compressed and normal (non-compressed) format. Gostview version 2.7 and above can handle compressed postscript. User preferences determine whether normal or compress postscript is streamed.
application/pdf	PDF	Portable Document Format. This type of document can be viewed with Acrobat reader, or Ghostview. PDF data can be optionally be compressed on a page by page basis; the viewer is responsible for decompression. The site policy is to store PDF in compressed format.
x-warpdoctor/inf	INF	OS/2 view type format
x-application/bookmgr	BOO	IBM's book manager format
image/jpeg	JPG	Graphic image
image/gif	GIF	Graphic image
image/png	PNG	portable network graphics format
application/vnd.stardivision.write		StarOffice word processor document - compatibility with WarpStock presentations
application/vnd.stardivision.draw		StarOffice graphic document - compatibility with WarpStock presentations
???		Lotus WordPro document - compatibility with WarpStock presentations
???		Lotus Presentation document - compatibility with WarpStock presentations
x-warpdoctor/rexx	REX	Rexx command line type program
x-warpdoctor/drrexx	RES ZPP	DrRexx type Rexx program
x-warpdoctor/warpin	W0R WPI EXE	WarpIN install package file.

Encoding

Encoded data streams are decoded by the browser before being displayed or passed to a helper application or plug-in. Or rather that is the theory. Some browsers do not recognized encoded data. Some browsers, like Netscape, only decode a data stream it displays the data stream. Other browsers, like Opera and Mozilla, decode the data stream regardless of the final destination of the stream, meaning the data is decoded before being passed off to a help application or a plug-in.

Types of Content

The content type determines

1. Where the data is stored.

2. The type of input screen presented to the user when adding content.

3. The format of the reference for the item when displayed on a web page.

4. What types of data must be stored for the item.

The table below summarizes the content types.

TABLE 2. Content Types

Type	ConType	MIME Types	Storage	Description
HCL	1	HTML	DB	Hardware compatibility - hardware that works with OS/2, and instructions on how to install it.
SCL	2	HTML	DB	List of software compatibility - software that works with OS/2, WinOS2 and ODIN, plus any special instructions on how to install it.
Publications	3	PS, PDF, INF, HTML, Text, BOO	DB or File	Books, software documentation, white papers, etc.
Articles	4	HTML, Text	DB	Articles from on-line magazines, etc.
Meeting Logs	5	Text	DB	IRC meeting logs and minutes, etc.
Documentation	6	INF, Text, HTML	DB	Application documentation, help, installation information, Read Me, etc.
Drivers	7	ZIP	DB or File	Driver software
Software	8	ZIP	File	Applications, utilities, etc.
Fix Packages, updates	9	ZIP, WPI	File	Fix packs, updates, etc.,
Links	10	-	DB	Links to other sites.
Image	11	JPG, GIF, PNG	DB	Images referenced by HTML text in other content types.

Hardware Compatibility (HCL)

Hardware compatibility is an item that describes a piece of hardware that is compatible, in some manner, with OS/2. The items in the site are entered against a specific piece of hardware by manufacturer. If a driver exists it is attached to the item, and instructions are entered, if necessary, for installing and operating the hardware or driver.

Hardware compatibility information is always a MIME Type of **html/text** and is stored in the Data table.

If no HTML tags, other than HREF tags, exist in the Remarks then simple HTML formatting tags are added to the remarks data when the item is saved to the database.

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TABLE 3. Hardware Compatibility Data Fields

Name	Description
Title	A title for the content item. This title appears on the page to identify the content
Company	The manufacturer of the hardware
Chipset	The chipset used in the hardware, if appropriate.
OS	The operating system the hardware item or drive works on.

TABLE 3. Hardware Compatibility Data Fields

Name	Description
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.
Remarks	Remarks or text describing the hardware, special installation instructions, or tips.
Driver	Points to a driver for this hardware.
See Also	Points to another content item related to this item

Software Compatibility (SCL)

Software compatibility is information about software applications that run on OS/2, WinOS2, DOS, ODIN, or other platform of interest to OS/2, such as SAMBA, and NFS, etc. The content describes how to install or configure the application to run on OS/2, or run with OS/2.

Software compatibility information is always a MIME Type of **html/text** and is stored in the Data table.

If no HTML tags, other than HREF tags, exist in the Remarks then simple HTML formatting tags are added to the remarks data when the item is saved to the database.

TABLE 4. Software Compatibility Data Fields

Name	Description
Title	A title of the application, utility, etc. This title appears on the page to identify the content
Company	Manufacturer or publisher of the software.
OS	The operating system the hardware item or drive works on.
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.
Comments	Configuration, installation or operation tips, advice.
See Also	Points to another content item related to this item.

Publication

Publication content type stores documents that are usually, but not always, softcopy versions of hardcopy documentation The publication data is stored either in the Data table or in one or more disk files, depending on the Site Configuration.

TABLE 5. Publication Type Data Fields

Name	Description
Title	Title of the publication. This is the title that appears on the site
Description	Description or abstract of the document.
Copyright	Date of copyright, if applicable
Printing	Printing or version
Authors	Names of authors
Publisher	Name of publisher or company/individual that produced the document
ISBN	ISBN number
Document Number	IBM or other document identifier, e.g. GG24-4295-00

TABLE 5. Publication Type Data Fields

Name	Description
Part Number	Part number, if applicable
MIME Type	Format of the data
URL	URL of original document, or source of information.
URLFlag	(Automatically set) URLFlag=1 means the URL is no longer valid.
URLDate	Date URL was last checked
Filename	Name of the file.
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.

Articles

This content type stores articles from on line magazine, white papers, and any other generalized or miscellaneous textual information.The article data is stored in the Data table.

TABLE 6.

Name	Description
Title	Title of the article
Description	Abstract or summary of the article
Date	Date when article appeared
Source	Web site, or original source of the article, if appropriate
Author	Author or authors of the article
URL	URL of the original location or main repository of the article
URLFlag	(Automatically set). If URLFlag=1 it means the URL is no longer valid.
URLDate	Date URL was last checked
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.

Meeting Logs

This type stores IRC meeting logs and other meeting documentation. The MIME Type is plain text: **application html/text**. The meeting log text is stored in the Data table.

TABLE 7. Meeting Log Type Data Fields

Name	Description
Title	Title of the meeting
Date	When the meeting happened
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.

Documentation

This type stores application specific on-line help, Read-me files and configuration information. The documentation data is stored in the Data table.

TABLE 8. Help Type Data Fields

Name	Description
Title	Title of the item
Description	Abstract or summary of document.
Company	If appropriate
Version	Version of the document or software described in the document
URL	URL of the original location or main repository of the article
URLFlag	(Automatically set). If URLFlag=1 it means the URL is no longer valid.
URLDate	Date URL was last checked
Filename	Name of the file on the server FS, if driver is stored in a disk file.
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.

Driver

Software that provides an interface between OS/2 and hardware, or a function using a virtual interface between OS/2 and another application or function. The driver is stored either in the Data table or a disk file, depending on the Site Configuration.

TABLE 9. Driver Content Type Data Fields

Name	Description
Title	Title of the driver
Company	Company the makes the hardware, or company that makes the driver, if different from the hardware maker.
Chipset	Chipsets the driver supports.
Version	Version of the driver
OS	Name and version of the operating system the driver works on.
URL	URL of the manufacturer of original source of the driver
URLFlag	(automatically set) 0 = valid URL, 1 = invalid URL
URLDate	Date URL was last checked
Filename	Name of the file.
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.
Comments	Any other comments, description or installation instructions.

If the user enters a file then the driver is stored from the file. If the user enters a URL and no file, then the driver is automatically retrieved from the URL and stored in the site.

Software

Applications, utilities or other software.

TABLE 10. Driver Content Type Data Fields

Name	Description
Title	Title of the application/software
Company	Company the makes the software
Version	Version
OS	Name and version of the operating system the application/software runs on
URL	URL of the manufacturer of original source of the driver
URLFlag	(automatically set) 0 = valid URL, 1 = invalid URL
URLDate	Date URL was last checked
Filename	Name of the file.
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.
Comments	Any other comments, description or installation instructions.

If the URL is present the data is served from the URL location. If the URL is present and the URLFlag=1, the URL is no longer valid and the data is served from the WarpDoctor storage. If the URL is NULL the data is served from the WarpDoctor storage.

Links

Links to other sites or information. For example links to support sites, software repositories, etc.

TABLE 11. Link Content Data Fields

| Name	Description
Title	Title of the link
URL	URL
URLFlag	Indicator of whether the URL is valid or not
URLDate	Date URL was last checked
USERID	User the added the item to the site. Used for determining access rights for changing or deleting.
Comment	Short description of the site or link.

Database Tables

TABLE 12. Database Tables

Table Name	Description
Folders	Defines the structure of the site, i.e. the folders. This is a structured table.
Content	The actual content of the site.
Data	Stores software, PS, PDF and other binary information, or length textual information.

TABLE 12. Database Tables

Table Name	Description
DataLinks	Provides the linkage between a content item and one or more data items
SeeAlso	Provides links between contents items.
Shadows	Use to "shadow" a single content item in more than one folder.
Users	Contains user information: user ID, access permissions, email name and contact preferences
Changes	Tracks changes to data: inserts, deletes, updates. Used for synchronizing mirror sites.
Companies	Manufacturers or publishers of hardware or software. This is a structured table.
OS	List of valid operating systems. Used to validate OS codes entered on content items. This is a structured table.
Links	HREF links to external URLs. Built automatically from embedded HREF in Comment field data when the row is entered or changed in the database. Used to auto-verify URLs.
Logons	Holds currently logged on users from browsers that are not JavaScript enabled and don't support cookies.

The linkage between the database tables is shown in the figure below
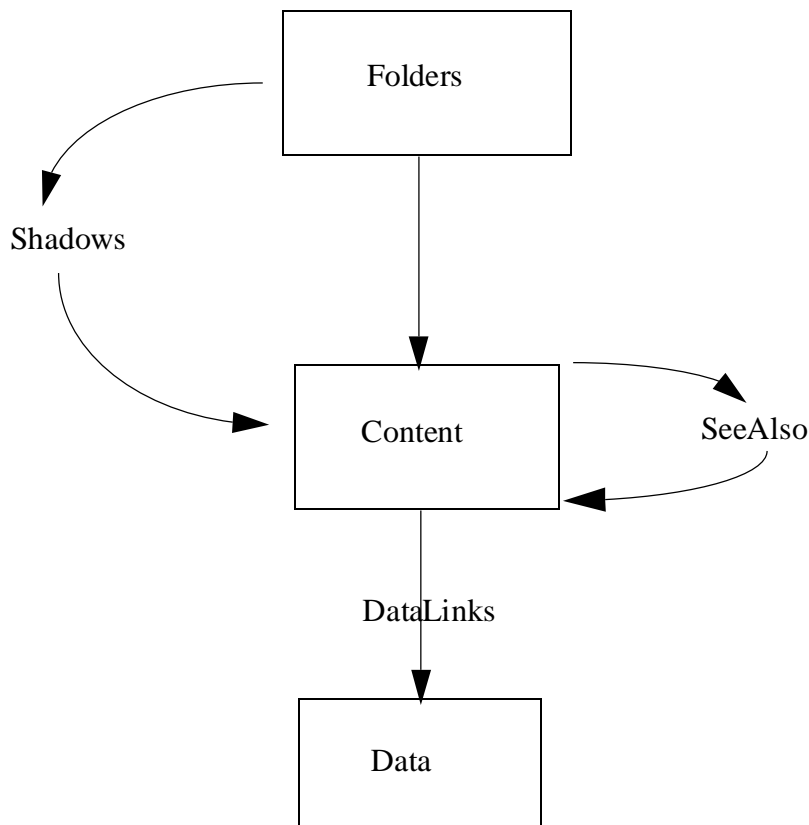
Each Content table row has a Folder code value, which links the Content item to a folder. The Shadows table also contains links between the Folder CODE value and a Content item. When the CGI program is displaying the content stored in a folder it reads all the rows from the Content table and the Shadow table that match the folder CODE value. This allows the same Content item to appear in more than one Folder.

The DataLinks table links rows in the Data table with a Content item. This allows multiple Data items to be linked to a single Content item, which handles, for example, situations like a publication being stored in PS, PDF and HTML format. The publication exists as a single Content item (row in the Content table), the PS, PDF and HTML versions of the publication are each rows in the Data table.

A Content item can also be linked to other Content items through the SeeALso table. This allows an item to list other items that are related or might be of interest to the viewer. When the CGI program formats a Content item for display it checks the SeeAlso table and lists all rows that match the Content CONCODE value as HREFs at the bottom of the page.

Structured Tables

Some tables in the database are structured tables, meaning the table has an hierarchal structure. An example of hierarchal structure is an organization chart. The database uses 3 "internal" or calculated fields in each structured table in order to summarize elements up the structure and to count items below an item along a path of the structure. The three internal fields are:

1. iCode - an internal code with 3 digits assigned to each level of the structure.

2. iParent - the iCode of the parent item.

3. Level - the level in the structure an item is on.

The WarpDoctor Editor creates and maintains the calculated fields for structured tables. An example of the internal fields are show below.

WD Editor

Folders

Title	Code	Parent	Level	iCode	iParent
Top Element	TOP	TOP	1	001	001
Home	HOME	TOP	2	001001	001
Download	DOWNLOAD	TOP	2	001002	001
Drivers	DWN_DRIVERS	DOWNLOAD	3	001002001	001002
Software, Applic	DWN_SOFTWARE	DOWNLOAD	3	001002002	001002
Hardware	HARDWARE	TOP	2	001003	001
Brand PCs	PC	HARDWARE	3	001003001	001003
Graphics Tablets	TABLETS	HARDWARE	3	001003002	001003
Keyboards	KEYBOARD	HARDWARE	3	001003003	001003
Mice & Pointing [	MICE	HARDWARE	3	001003004	001003
Modems	MODEMS	HARDWARE	3	001003005	001003
Monitors and Fla	MONITORS	HARDWARE	3	001003006	001003
Motherboards	MOBO	HARDWARE	3	001003007	001003
Network Interfac	NIC	HARDWARE	3	001003008	001003
Printers	PRINTERS	HARDWARE	3	001003009	001003
Radio and TV Ca	TV	HARDWARE	3	001003010	001003
Removable Media	RMEDIA	HARDWARE	3	001003011	001003
Scanners	SCANNERS	HARDWARE	3	001003012	001003
SCSI Cards and C	SCSI	HARDWARE	3	001003013	001003
Sound Cards	SOUND	HARDWARE	3	001003014	001003
Telephony and V	TELEPHONY	HARDWARE	3	001003015	001003

Maintaining Links

The Link Checker component checks the validity of URLs embedded in the database. The checker attempts to access the URL specified. If successful it updates the URLDate value to when the check was made. If the check fails the URLFlag is set to a failure value. The CGI programs that serve information use the URLFlag values to automatically switch from an invalid URL to data stored internally in the WD Site.

Someone from the WarpDoctor staff must periodically check the invalid URL report and correct or remove the URLs that are in error.

Maintaining the Mirror Site(s)

The Changes table keeps track of inserts, deletes, and updates to all the tables in the database. For each insert, delete or update event a row is entered in the Changes table with the table name and a timestamp when the change happened. The SynDat routine uses the timestamp value to apply all the changes in a specified time period from one site to another.

The Changes table is maintained by triggers on all the tables in the database.

User Logon and Authentication

Two different mechanism are used to handle user logon, depending on the type of browser being used:

1. For JavaScript enabled browsers and allow cookies, the User ID and encrypted authentication code are stored in a temporary cookie. The User ID is also stored in a permanent cookie, along with the user password if Store Password is selected on the logon screen.

2. For browsers that do not support JavaScript or cookies, when the user logs on a row is entered in the Logons table with that user's IP address, user ID, password, and access authorities, along with a timestamp. Each time the user accesses a new content item the CGI program checks the Logons table for a row with the user's IP address. If the address matches and the row has not expired, the access authorities are used from the row. Rows in the Logons table expire after a specified time or when the user logs off the site to prevent someone else from re-using that IP address to gain access to the site. The amount of time the row is "good for" is configurable in the Site Settings.

Components

Database

DB2 version 5. Triggers are used to maintain the Changes table.

WD CGI Programs

These are the programs that are called by the browser and retrieve information from the database server and format that information for the browser.

- Menu server

- Content server

- User Logon and authentication

- User site preferences

- Start database

- Start and monitor connection manager and connections

WD ODBC Classes

The WD ODBC Classes are a set of VisualAge C++ v 4 classes for accessing and manipulating data in an ODBC enable database. The classes will also work with the IBM CLI interface against DB2 databases. The classes include:

- PEnvironment - top level class, determines where a direct or remote driver will be used.

- PConnect - provides a connection to the database

- PCursor - opens and maintains a database cursor

- PStatement - creates an SQL statement for repeated execution.

- PDatatypes - provides the datatypes available in the database

- PTableDefs - provides a view to the tables defined in the database

WD Connection Manager

The Connection manager is a utility that provides and maintains a pool of database connections that can be used by the WD ODBC Classes. The connection manager opens a specified number of connections and loans those connections to an application written to use the WD ODBC Classes. When the application terminates, or closes the connection the Connection Manager adds the connection back to its pool of available connections. This loaning and restoring of connections happens much faster then making an actual connection to the database, thereby speeding up the connection process for application programs, such as the WD CGI programs. The number of open connections that are to be maintained by the Connection Manager can be specified in parameters. If a new request for a connection comes in when there are no open connections available the Connection Manager can create a new connection to handle that request. That connection then remains open after it returned to the pool

until the configured Decay Time has been reached, where the Connection Manager will then close the connection.

The Connection Manager can be started, stopped and reconfigured while running from HTML screens.

WD Rexx Plug-in

The WarpDoctor Rexx Plug-in provides the framework for Rexx programs to run as plug-in programs in a browser. The WarpDoctor site uses the DrRexx programs to provide the folder container and input/edit screens for adding content.

Plug-in Installer

The Rexx Plug-in is installed on user's machines by a WarpIN installer package. The installer installs the plug-in and related DLLs to each browser on the user's machine.

EPM/E-MLE DrDialog Add-in Control

The EPM - EMLE control is a DrDialog/DrRexx control that uses EPM to provide a MLE in a DrRexx dialog. The control provides an interface between DrRexx and the E-MLE control, and provides visibility of the EPM Toolkit functions to the Rexx program.

This control provides the ability to use EPM as the HTML input control. This allows for drag and drop of image files, menus for HTML tags, and all the normal EPM features such as spell checking, etc.

WD Editor

The WarpDoctor Editor is a DrRexx program that provides editing features for structured and non-structured database tables. It also displays the folder container, User Settings notebook and pop-up menus for Site Administration type users.

The WD Editor can run either as a stand alone application, as a plug-in application where it appears in a browser window. When running in stand-alone mode the Editor connects to the database using the DB2 CAE facilities, which means that the DB2 CAE must be installed on any machine that runs the Editor in stand-alone mode. When running in plug-in mode the Rexx Plug-in and server CGI program provides the database access; the DB2 CAE is not required on the client or user machine.

When editing structured data the data can be presented in either a tree format, or a column and rows format, i.e. the Detail view. Columns can be added, hidden and moved and a split line added and moved using the Setting

notebook. The columns and split line are moved by dragging in the notebook page, columns are hidden or added to the display by double-clicking on the column in the notebook page..

The Editor also has a Detail-Outline mode that combines the Detail view with showing the data in an outline format. A row can be expanded or collapsed by using the plus/minus keys.
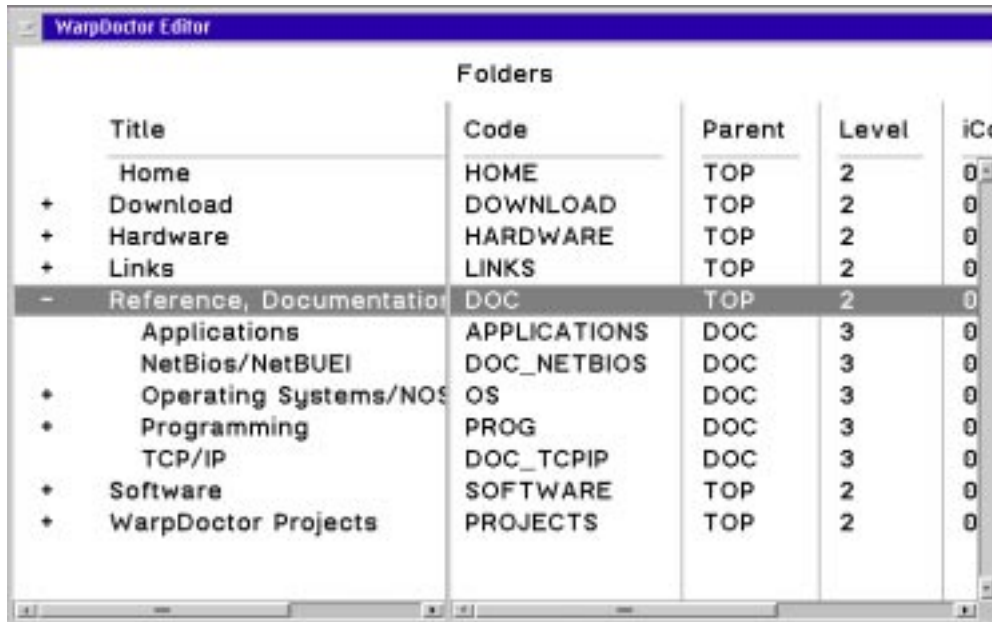
The editor can edit any database table.

Site Components - Toolbar and Entry Screens

The drag and drop capability of the Item icon, Delete Icon, Save icon and Clipboard icon are provide through a DrRexx program that provides part of the tool bar.

The entry/edit screens for each content type are also provided by DrRexx programs. Those content types that can be entered/edited by non-plug-in enabled browsers have the entry/edit screens and functions duplicated in HTML and CGI.

Link Checker

The Link Checker is the utility program the checks all the URLs in the database to make sure they are valid. When it finds a URL that is invalid the row if flagged for a Site Administrator to check out. This can be started manually or run automatically by a cron utility.

File Synchronizer

The File Synchronizer checks for missing disk files associated with a content item that is stored on disk. It also flagged any files in a directory that are not linked to the database. When a file found to be missing the Content item is flagged so that a Site Administrator can fix the problem.

This can be started manually or run automatically by a cron utility.

SynDat - Site Synchronizer

The program replicates changes made in one site to another site. The changes that are replicated include:

- Database table changes.
- Linked files added or deleted.

This can be started manually or run automatically by a cron utility.