Literature Review

2.1 Theoretical background

We hope to share this system with **other groups**, we must implement a solution that can be adopted at other institutions. .write access by more clients must be available.

2.2 What is a Digital Library?

A **digital library** is a collection of information that is stored and accessed electronically. The information stored in the library should have a topic common to all the data. For example, a digital library can be designed for computer graphics, operating systems, or networks. These separate libraries can be combined under one common interface that deals with computers, but it is essential that the information contained within each library remain separate. The purpose of a digital library is to provide a central location for accessing information on a particular topic. The last thing a user wants to happen when he searches for information about computer graphics is to get information on operating systems. A digital library must keep topics separate, otherwise it would be totally useless. A digital library should also have a user interface that is easy to use. "(*James Richvalsky* and David Watkins, April 11, 2000)

2.3 Digital Material

In this computerized day and age information and the medium on which it is recorded can be considered as either digitized or not. There are many other ways of categorizing the material, but computer readability is the important criterion here."Digital" can be taken as a synonym for "computer readable." This is a serious generality, but it is this aspect of information that is most

relevant to a digital library. The creation of digital information from conventional is generally a two-stage process.The first stage is digitization. This is essentially the conversion of the physical medium into a digital representation of that physical medium. It takes no account of any information content of the original material, in the sense people would generally recognize the term. .Consider the process of scanning a piece of paper. This produces a computer readable (digitized) image of the paper within the computer. It is stored as a computer file that can be manipulated as any other file (i.e., it can be sent from computer to computer, or be copied or deleted). The original paper could be a page of text or a picture or even blank. We recognize different information content in each of these cases. The computer only recognizes a digital "picture" of them. The second stage of the computerization process is to have the computer extract information from the digitized image. For text this is done by Optical Character Recognition (OCR) software that recognizes the shapes of the letters of the alphabet and produces a file exactly the same as one produced by a word processor used to type in the same text. Feature recognition software can perform an analogous process on a digitized image of an original picture, or on a sound file from a tape or record original. This stage allows some of the information from the original page to be made available to the computer. Thus, it is now able to index the text for retrieval and is also able to reformat the text for different forms of output. Note: At the digitized image stage it is only possible to perform so called "graphical manipulation" such as stretching, compressing, turning color to black and white, etc. on the image.All this processing applies to material that comes originally in non-digital form. Most of the existing stocks of libraries are in this form. For this material to become part of a digital library the material must be at least digitized or, more usefully,

be converted to computer-manipulable form.This is the process that takes time and money. Once this process has been completed for an original object, such as a book, the library now has three alternative representations of the same object. They each have different properties and allow for different activities. It is important to realize both the power and dangers of this information in its different forms. This process of digitization and conversion is not perfect. There are losses of information.

However, with some intellectual input it is possible to apply a reciprocal process to reproduce a facsimile of the original. In its simplest form this is merely printing out the text file form of the original document. If enough information has been captured or recorded by human input, then the

	Original	Digital Image	Digital Information
Physical Form	Physical Object book	Computer file	Computer file
Format	Varied(English,text,VHS)	Graphical file(.BMB,MPG etc)	Structured file(.Doc.Mpg) Database and index records
Readability	Human or special equipment	Computer graphics program	Computer text, Video or database program
Reproduction	Physical duplicate original(photocopy, duplicate)	Copy file and print any number od exact duplicates	Produce original information in different form (re_print book in large Italic type,play video with different sound track)
Manipulation	Physical modify(write in margins,cut and splice tabe)	Mark electronically and manipulate graphically (add user specific notes,reduce/enlarge,re_sequence change colors,paste alternate images)	Edit the original information,produce derivative work,copy and distribute endlessly

Table 2-1 : Digital Material

reproduction may approach the level of a duplicate, matching (in the case of a printed document)size, style and typography.

Today increasing amounts of material are originally produced in digital form. These have, in one sense, no physical presence other than the computer file that is their original form. Thus there are an infinite number of ways they can be realized for human consumption all of which are valid, yet all of which vary in the sorts of detail that abound in physical objects.As a particularly nasty example consider a computer program. This has two very clearly distinct methods of reproduction for human consumption. One is a listing of the program commands in a programming language. The other is the program itself when it runs and interacts with the user. Which is the more "correct" representation? And how should it (they?) be represented

2.3.1 *Sources of Material*
2.3.1.1 *Internal Sources*

Does the organization generate the material itself? Does it generate it in the original, physical form or in digital form or both? If a digital form is not currently produced, can the creator easily produce it?A typical example here would be where one of the collections is to be the full text of internalreports. If the report writers were to be asked (or required) to submit an electronic form of the report as well as the current paper copy then a lot of time and expense could be saved in creating the digital collection. It would also save the necessity of correcting the mistakes introduced by the imperfect digitization process. Does the organization have the means already at its

disposal to digitize its material? Is most of the material going to come from existing collections? How much of these collections is unique and will have to be converted instead of possibly buying-in the pre-converted information? Archives, Etc.?If archives are involved then the biggest question is "Is it really worth it?" If the archives are rarely used then there is little reason to go to the expense of digitizing them, unless the reason for their non-use is that they are inaccessible in their present form. Obviously security and collection promotion considerations can radically alter the worth of the collection in digital form.

An alternative to wholesale retrospective conversion is to create a computerized index to facilitate access and then to digitize as required by use. In this scenario it would probably be sufficient to just create images of the archive material and not try to extract the information from them (if they are text). This would offer quicker and cheaper methods and would supply the advantageof electronic delivery.

2.3.1.2 External Original Sources

If the source of the material is external to the organization then it is important to ask whether a gateway operation would be more suited to what is required. The copyright and commercial issues of dealing with this material become much more complicated than for owned material.

One possible reason for locally held, externally originated, material is to enhance the value of the whole library. Here it may be desired to manipulate the contents of the material and this has to be very seriously considered before it is undertaken.

The external material may be bought outright, its use may be licensed, its use may be leased,or its use may be on a "pay-per-view" basis. The material may be acquired through exchange or gifts just as conventional material is. Sometimes the attraction of the (proposed) library site to external users is such that the library may charge for external material to be made available through the library.

2.4 automatic Indexing

This is the extraction of the information for a bibliographic record (the "metadata") directly from the original text by a computer program. It is particularly concerned with the extraction of keywords as an indication of the content of the document. Often it is called free text or full text

indexing. They do differ, but an important part of their appeal is the automatic extraction of the indexes from the text.Its advantage is that there is no human intervention. Thus it can be run continuously and cheaply. The extraction (indexing) process is the same for all documents and thus avoids the idiosyncrasies of individual cataloguers. Authority files (or lists) can be used extensively to further ensure consistency.

2.5 Valuable is the Library's Information

This is a sub-question of the previous one. If the library is central then, presumably, the information is important. If the library is used only occasionally, but intensively (as in the reference section of a library attached to a research laboratory), then it is still valuable. The best benefit may

be obtained through improved search tools for internal and external information rather than digitizing everything in sight If the library is used infrequently or is an archive then the cost of digitizing may still be

justified, but on different grounds.The library may have been bypassed as an information dissemination center and digitizing its collection(s) may be a

way to re-position the library into a more central role. This may well have cost implications for the organization as a whole rather than just the library or its parent division.Is the Information Changing?If information is changing, then the ongoing costs of re-entering the information into the system will need to be considered. Also important is the policy for handling different versions of documents within the digital library.An alternative scenario is that the focus of the library (and presumably the organization) is changing. If this is the case then it is prudent to consider if now is the time to start a digitization program. Much of the material may be irrelevant in some months' time. However, this may be just the time to start the process as the new material can be acquired and processed directly into a digital library system. The material may be acquired in digital form or the costs may be justified by one-time processing as the new material is acquired.Do the Library or Organization Want an In-House Digital Library?This is a methodology question. It may be possible to outsource all, or most, of the functions of a digital library. Alternatively, it may be possible to buy access to external search and delivery services that cover most of the library's requirements in the digital area.This can save on initial digitization and on-going administration costs. Service organizations exist which will operate the whole digital library remotely in complete security and confidentiality, from the initial digitization through the ongoing provision of the search and delivery services.However, they do not, in general, have the subject expertise of the in-house library staff andthere may still be security and service availability issues to consider. A factor, which modifies this discussion, is the growing prevalence of Application Service

2.6 Use For Digital Library

Will users be offered different (new) services that are not currently available? Will some of the services replace those of the conventional library? What changes in the way users work will be introduced by the advent of the digital library? What changes in the rest of the organization will be needed to accommodate the new method of operation? What will be needed to make best use of the digital library? Is there likely to be an improvement in conventional library services as a result of converting some services and information to digital format?As an example, the delivery of material directly to the user's desktop can have a profound impact on work patterns. For a magazine publisher where the library holds the picture library,careful design and integration of the remote digital library holding the magazine's pictures means that the journalist can drop straight from his/her word processor into the library search routine, find an appropriate picture, and copy it directly into the page. This may be appropriate where the journalist is also responsible for page make-up, however, it may be a better use of resources if the journalist gets only a low resolution "place holder" picture and the high resolution image is queued at the final printing equipment for inclusion at that stage. In this example both the method of working and the nature of the information held by the digital library are candidates for modification. This is generally an iterative process to achieve the best result.

2.7 Digital Library Accesse

Since digital libraries are held within computers it is important to realize the possibilities for access that are offered and are denied. Access can be permitted from the user's desk wherever that may be. Traveling workers can

be given access directly or via the Internet .If users do not all have

computers then public access must be provided. Is this best done

within the physical confines of the library or should/could it be distributed

across different buildings?If these "library access stations" are used then

they will need equipment and maintenance,but will be physically close to the

users. It may be a good idea to add some extra facilities to the stations, such

as reference material, chained copy of the staff handbook, **color local**

printer, etc.,so that they become specific work points. This is leading the

deployment of the digital librarywithin the organization in a particular

direction with certain benefits and costs. Another access model is to assume

all access will be from desktop computers. These do not need to be fully

functional PC's. Network computers or clustered workstations (such as the

Sun™ Sun Ray™ machines) can be tied to a local server and provide

inexpensive access to users who do not have full PC's. This model has the

advantage of cheap deployment, easy desktop access and access to a wide

variety of applications, possibly held within the digital library itself.

There are many models, even within a defined IT strategy, and the choice of

one (and its modification to local requirements) needs as thorough a study of

the users as of the library itself.Since access via the World Wide Web is

becoming so important, discussion of this has now grown to its own chapter

(Chapter 2), where many of this issues specific to Internet and Web

access will be raised, and many of the general access issues will be seen in a

particular context.

2.8 Security

Just like physical material, the digital material of the library is valuable.

Access to it must be guarded and its well-being must be ensured.

Security for the digitized material must be provided in the form of restricted access to the computers that hold the material. This includes both physical access and electronic access across a network.

The precautions are elementary and are well known in the commercial world.However, they may be unknown to the library. Unlike the physical stock of the library, the digital stock must be copied and secured. This protects it from natural disaster, malicious damage, and software errors.

Access security at least, must be allowed for in the digital library. The library may be freely accessible to all, but certain sections must be protected. Just as certain sections of the physical library are protected no matter how open the catalogues and stacks may be, certain areas of the digital library and certain functionality must be protected. If the material is not freely available then a method of restricting access to those who are allowed with a minimum of inconvenience must be arrived at. If the material is to be paid for then it must be secure until the **payment is made** (or promised) and then it must be correctly accounted for. The users must also be given an option to back out of any situation where they are about to commit a sum of money

The increasing use of smart cards and the concept of "user customization" means that security is now both more possible and more difficult than a few years ago. Systems which allow customization do not always extend that from the "look and feel" to internal functionality. Thus it may not be possible to block the dangerous functions when required, except by the introduction of passwords for all.Specialized software now exists (such as EduLib's STOPit system) for use on library workstations which allows the functionality of those machines to be linked to individual users via their library card or some form of key. This solves some of the security issues and can add extra features such as gathering usage statistics and allow for

interface design.Watermarks and Other Protections Earlier it was mentioned that the user's computer is inherently capable of copying any digital material on it One protection against this practice is to introduce watermarks into the library's digital material. A watermark will not prevent copying, but it will mean that the owner of the copied material can be recognized. Modern systems can do this even if only part of the material (say a part of a picture) is copied. It is also not possible to overwrite one watermark with another without a special key.

2.9 Reasons For digital Library

2.9.1 To Generate Income

Is the intention to sell the new digital services and/or information? If so, are they to be sold internallyor externally? Are they to be sold for real money How are the prices to be set? How will the users come by the money to pay for the services? Will priced services just drive them away? How will the costs be recorded and accounted for? Most library software does not have the capability to charge for services on a per transaction basis. Even recording "logged on" time is often not possible and this has a very detrimental effect on user satisfaction. If income is generated, then the matter of copyright payments and even taxes becomes Important as well as possibly changing the status of the library. In addition to these regulatory and legal matters, it may well be that the bookkeeping associated with charging and collecting the fees costs more than the income generated.

2.9.2 To Promote Collections

Some libraries have unique collections and the promoting of more widespread use of them is one common aim. This is particularly true where

the collection is one of rare and expensive material.Fragile material with special handling needs is another good reason to digitize the collection. In all these cases once the digitization process has been undertaken the original material can be returned to its preservation environment. Because the digitization is done by experts and only done once, it can be painstaking and therefore mindful of the preservation and security needs of the collection. The originals will then be required for study much less often as the only reason to use them is now to study the actual construction of the objects, not their "information" content.Obvious examples are rare books, manuscripts, pictures and the like. (or exceptionally a single work—think of the British Library's "Beowulf" project) warrants the expense of digitization because of its rarity or value or utility.Since the decision may be made on publicity or "public benefit" grounds, the actual cost may not be important.

2.9.3 Provide a Gateway

If the library is considering primarily providing access to already digitized material and/or material acquired from other parties, it may be sensible to consider a gateway operation. In this the library is running a service that is only a re-direction of the users' questions to the holders of the original digital material. The gateway may provide its own indexing and search services and it maycombine original resources from a number of different providers. Gateways are becoming quite common in the library world.The major difference between outsourcing and running a gateway is that the outsourcing is entirely of your information and is an operation being run for you by a third party. A gateway is where your operation is linking to independent third party sources.

2.9.4 Because of Staff Pressure

Similarly to the above, it may be staff pressure that suggests the creation of digital collections or the conversion of the library to a digital format. This may be from a desire to better serve the library users, to better exploit the collections, to experiment with new technology and techniques,

to continue to be part of some external organization (such as an information-sharing consortium), or to undertake interesting and challenging projects. Staff may wish to enhance their professional training and remain abreast of current technology and thinking in their field.Alternatives

2.9.5 To Raise the Library's Profile

The library may feel it needs to undertake a project to raise its profile either internally within its parent organization, or externally. This is a perfectly good motive, but it should be understood asthe motive and not hidden.

2.10 The Costs Of Library

2.10.1 Start-Up Costs

The variability in start up costs depends mostly on the material to be included in the digital library. Volumes are an obvious factor. The type of material and the degree of digitization and the completeness ("resolution") of the digitization also affect the cost. Care and attention to fragile material adds to the cost. All the above apply to local material to be digitized. If the mat erial is to be acquired in digital form then it has an obvious cost.Once the material has been digitized, it has to be loaded into a suitable library application.This will store the digital material (often in a database or in a file store), index it and add it to the library housekeeping database. There will need to be normal library housekeeping operations such as authority file maintenance, assigning material to access classes, determining library policies, etc., just as in any library system. The library system will have to

run on computers. Either a large server and workstations or a server and network computers or a network of computers will be needed. The configuration and the need for specialized computers such as video servers, must be determined in consultation with the supplier of the library system software. Networks and network and application servers may need to be set up or upgraded. Bear in mind that digital files are generally very big and thus take a lot of storage space and are slow to transfer across a network. Thus a network that is perfectly adequate for office automation may well be totally inadequate for allowing users to view video, even one at a time.

Added to all the above capital expenses are the staff training costs for both library staff and end users.

Disruption inside and outside the library adds a cost to the whole exercise. If the service is to be made widely available (particularly outside the organization) then it must be advertised and promoted in some way.If the service is to be made publicly available then there may well be registration and licensing costs involved as well as trademark and name protection.

If some services will come from external organizations, then there is an obvious (though not necessarily easily quantified) cost attached to them.

2.10.2 Ongoing Cost:-

Addition of new material to the library incurs the same processing (or purchasing) costs as when the retrospective conversion was done. If there is a regular flow of material then it will be possible

to negotiate a reduced per unit rate with a conversion specialist.

For externally networked services there may be telecommunications charges, particularly if the service is transferring large amounts of data across a third party network (such as the Internet or a public carrier network).

Every so often the physical capacity of the computers either to store material or to handle the number of users will be exceeded and they will need to be upgraded. The organization's IT policy and infrastructure will change and the application and data must be migrated. Regular backups of

the data must be made, checked, and archived. Staff will change and new staff need to be trained. Users will need regular training.

2.10.3 How to Reduce Costs

First, determine exactly where the services have to be delivered. Accurately size the amount of material for both conversion costs and computer costs.

Try to acquire gateway access to material which is not your own. Then determine which are the core collections and which are most needed.

If necessary, aim for an 80/20 solution by dropping services or collections which are not extensively required or are infrequently used. Consider access to other suppliers for those services on an "as needed" basis. Determine exactly what use will be made of the material and, particularly, howit will be retrieved. Do not buy a retrieval (catalog) system which charges for features that your users do not want or will not use. Be careful of this last suggestion as it could lead you into a "low functionality" trap. It is always better to buy the more functional system rather than to sacrifice the possible function or service. The cost savings here are not generally large in the overall scheme of things.

2.10.4 Income

If the library is going to attempt to at least cover costs then all possible sources of revenue must be considered. Organizational limitations and licensing requirements may restrict what can be done. See also Chapter 2 with further information on revenue attraction, and the cost/benefits of various methods.Direct payment for information is the most obvious income

source. Usually this is for accessto the full text document or the full video, etc. Access to index and catalogue records is not usually charged for, though this may occur in some cases. This payment may be on a "pay-perview"basis that is cheaper for the occasional user, but a serious administrative problem for the library to collect the fees. Better is a subscription basis for either some counted use (number of visits, number of hours on-line, searches, texts read or printed, etc.) or for unlimited use (within certain functional areas) for a fixed period. It is quite common to allow on-screen reading, but not printing, as this has an added cost level.

Also a possibility is the provision of advertising to obtain revenue. This option has to be considered very carefully as inappropriate advertising (and even any advertising at all) may appear to compromise the integrity of the site. Sponsorship may be more appropriate than on screen advertisements, but advertising must still be carefully considered as an option. Hosting of collections and services for other libraries is a possibility, but requires the investment in the professional staff and equipment to make this possible. It is not a "garage" operationany more.

2.11 Technology

211.1 Standards

As with all matters to do with computers there are standards that impinge on the area of digital libraries. Unfortunately, since these libraries are at a cross-road, there are a number of standards which might be appropriate. Of course, some of these standards are mutually contradictory or even exclusive.

The standards fall into three areas: material description, user access and systems architecture.

2.11.2 Material Description

In terms of material description by far the strongest standards come from the library profession.

Two forms of description have to be considered; the abstracted information (or metadata) which constitutes the bibliographic description in conventional library systems; and the material itself.In a truly multimedia digital library it is also necessary to consider the relationship between the various items and pieces of material and their different forms and formats.Descriptive standards such as AACR2 and MARC from the library side here compete with SGML and HTML from the "Web" part of the computer industry and document description standards such as .PDF (Page Description Format) from the document handling community. These standards are not mutually exclusive, but there is a lot of overlap and converting from one to another is a function to be considered at the design and acquisition stage.Recent entrants on to the stage are the re-vamping and rationalizing of MARC to MARC21, the increasing use of the Dublin Core set of descriptors (attributes), and the conversion of both of these and the full material to document types within XML(eXtensible Markup Language). These

changes are promising to bring digital library systems closer to commercial systems in terms of interchanging actual material, but the difference in approach at the cataloging and processing (circulation vs. sale) stages is still large.Non-bibliographic material (pictures, sound, etc.) is handled by the MARC format, but thereare competing standards. For instance, for geographic information there are descriptive standardscoming from the cartographic professions. Many of these are actually more interested in describingthe original (the terrain) than in describing the physical material (the map) or its digitized equivalent.This strongly suggests that until

universal escription frameworks (standards) are in place, it is very important

to decide what the material is, what needs to be described, who it is intended

for, how it will be retrieved, and how it will be processed and used before
deciding on a scheme for its description.

2.12 Future Possibilities

Future development of the DLS Web site means it will be used as a server,

providing access to Web sites and Database of other libraries.The

experimental connection of several remote Sudan libraries via asynchronous

channels will be supported by Datanet Company. remote WBs perform the

representation function, and also some application and resource manager

functions. To support local database they must ensure:

- interface with local database;

- connection with permanent database management.

2.13 Backup Recovery

2.13.1 Definition:

Backup/Recovery involves the process of making a copy of a database The whole file system can be backup periodically as a single database file. It allow safe recovery of data from industrial strength backup hardware such as DAT drive or other storage system.

2.13.2 Why Backup

in case of an equipment failure or disaster, then recovering or retrieving the copied database if needed.

backing up the database and associated files and the process of restoring

those files to the server. Without a solid plan in place that reviews the best approaches for setting up a plan, testing the plan and executing on that plan, you Planning for data recovery is more than just making sure your database is backed up works, that responsible planning and management of your systems includes more than just backing up to a device and then restoring the database should systems fail. There are three different types of recoveries

1. FULL DATABASE RECOVERY AND RESTORE

This requires that you restore the most recent full database backup, and then apply all transaction logs that were backed up after that backup was taken. At the end of the process, your database will be in the same state it was as of the time of the last transaction log backup.

2. POINT-IN-TIME RECOVERY

using transaction logs, to a specific time when you know the data was valid. This typically means you've discovered data issues after some time has

passed. This usually means restoring the most recent backup, then applying transaction logs to the system up to just before the time when you know.

3. SPECIFIC TRANSACTION RECOVERY

your application can be managing transactions in the code by starting transactions, doing a bit of work, and then committing the work to the database with an end transaction call. If the transaction fails, it can be rolled-back, putting the information in the tables into the same state that it was in when the transaction was started. In addition, if the server were forced to restart during the transaction, MYSQL would roll back the transaction,

putting the database into a known state—the values representing the values in the database at the time that the transaction was started.

2.13.3 **Backup Policy**

backups must be scheduled periodically. Full backups (a snapshot of the data at a point in time) can be done in MySQL with several tools.

Consider the following backup policy:

• Nightly backups

• Hourly transaction log dumps

• Database backups are kept online for five days, then archived to a seconda

• Transaction logs are rotated to keep the most recent 24 hours available

InnoDB Hot Backup provides online non-blocking physical backup of the InnoDB data file, and mysqldump provides online logical backup. This is an online, non-blocking backup that does not disturb the reads and writes on the tables. We assumed earlier that our tables are InnoDB tables, so --single-transaction uses a consistent read and guarantees that data seen

by **mysqldump** does not change. (Changes made by other clients to InnoDB tables are not seen by the **mysqldump** process.) If we do also have other types of tables, we must assume that they are not changed during the backup. For example, for the MyISAM tables in the mysql database, we must assume that no admistrative changes are being made to MySQL accounts during the backup. The resulting .sql file produced by the **mysqldump** command contains SQL INSERT statements that can be used to reload the dumped tables later.Full backups are necessary, but they are not always convenient. They produce large backup files and take time to generate. They are not optimal in the sense that each successive full backup includes all data, even that part that didn't change since the previous full backup. After we have made the initial full backup, it is more optimal to make incremental backups. They are smaller and take less time to produce. (The tradeoff is that at recovery time, you do not restore your data just by reloading the full backup. You must also process the incremental backups to recover the incremental changes.) To make incremental backups, we need to save the incremental changes. The MySQL server should always be started with the --log-bin option so that it stores these changes in a file while it updates data. This option enables binary logging, so that the server writes each SQL statement that updates data into a file called a MySQL binary log.

Each time it restarts, the MySQL server creates a new binary log file using the next number in the sequence. While the server is running, you can also tell it to close the current binary log file and begin a new one manually by issuing a FLUSH LOGS SQL statement or with a **mysqladmin flush-logs** command. **mysqldump** also has an option to flush the logs. The .index file contains the list of all MySQL binary logs in the directory. This file is used for replication.

        The MySQL binary logs are important for recovery, because they are incremental backups. If you make sure to flush the logs when you make your full backup, then any binary log files created afterward contain all the data changes made since the backup.

2.14 Copyright

2.14.1 Definition

Copyright is a protection that covers published and unpublished literary, scientific and artistic works, whatever the form of expression, provided such works are fixed in a tangible or material form. This means that if you can see it, hear it and/or touch it - it may be protected. If it is an essay, if it is a play, if it is a song, if it is a funky original dance move, if it is a photograph, HTML coding or a computer graphic that can be set on paper, recorded on tape or saved to a hard drive, it may be protected. Copyright laws grant the creator the exclusive right to reproduce, prepare derivative works, distribute, perform and display the work publicly. Exclusive means only the creator of such work, not anybody who has access to it and decides to grab it. Copyright protects works such as poetry, movies, CD-ROMs, video games, videos, plays, paintings, sheet music, recorded music performances, novels, software code, sculptures, photographs, choreography and architectural designs

2.14. 2Begin Copyright Protection, and Required

Copyright protection begins when any of the above described work is actually created and fixed in a tangible form.
The above applies to digital art and graphics. Open a gif, jpg or png file that you created and look at the properties. It states the date that you saved it to your hard drive as the date of creation. If somebody copies a graphic from your web site I assure you that the date of creation on your copy of the file is earlier than the copy taken off your web site. If that still doesn't feel like enough proof for you, save everything to a floppy disk and mail it to

yourself via certified mail. Keep the envelope sealed, wrap it in protective plastic and put it in a safe place.

Somebody once asked if it was "illegal" to place the copyright © symbol next to your name if you have not registered your copyright. Unless you have stolen the work from somebody else and you are not the true author of the work, it is not illegal to place the copyright © symbol next to your name - it is your right to do so.

The proper way to place a copyright notice is as follows: Copyright © (first date of creation) (name of owner). Like this: Copyright © 2003 Malak Osman

2.14.3 valid copyright notice

A copyright notice should contain:

- the word "copyright"
- a "c" in a circle (©)
- the date of publication, and
- the name of either the author or the owner of all the copyright rights in the published work.

For example, the correct copyright for the fourth edition of *The Copyright Handbook*, by Stephen Fishman (Nolo) is *Copyright © 1998 by Malak osman*.

In the Sudan, a copyright owner can significantly enhance the protection afforded by a basic copyright. This is done by registering the copyright with the Sudan. Copyright office.

2.14.4 Who owns the copyright in a joint work

When two or more authors prepare a work with the intent to combine their contributions into inseparable or interdependent parts, the work is considered joint work and the authors are considered joint copyright owners. The most common example of a joint work is when a book or article has two or more authors. However, if a book is written primarily by one author, but another author contributes a specific chapter to the book and is given credit for that chapter, then this probably wouldn't be a joint work because the contributions aren't inseparable or interdependent. The U.S. Copyright Office considers joint copyright owners to have an equal right to register and enforce the copyright. Unless the joint owners make a written agreement to the contrary, each copyright owner has the right to commercially exploit the copyright, provided that the other copyright owners get an equal share of the proceeds.

2.14.5 Copyright Protection end, or expire

Copyright © 2003 Malak Osman =The dates that you see in a copyright statement do not refer to the dates that the owner's material will expire and become public domain - they actually refer to the dates that the material was created. several dates in a copyright statement, means that certain things were created in one year and modified later. It could also mean that new things were created and added in a later year. It most definitely does not refer to the date that a copyright will expire. Expiration of a copyright actually takes place much later, and this period of validity begins from the date that you see in the copyright statement. The Berne Convention establishes a general and minimum period that lasts the life of the author

and fifty years after his (or her) death. Cinematographic works and photographic works have a minimum period of protection of 50 and 25 years upon the date of creation, respectively. This applies to any country that has signed the Berne Convention, and these are just the minimum periods of protection. A member country is entitled to establish greater periods of protection, but never less than what has been established by the Berne Convention copyright statement reads, "© Copyright 1998, 1999 Malak Osman" and John Smith is from a country that has signed the Berne Convention, he created his works in 1998 and 1999, and his copyright is not going to expire until at least fifty years after he dies

2.14.6 Copyrights and the Internet

Public domain - not! When visiting a web site, it is so easy to click and save with a mouse button when one sees a graphic image that one likes, or to view the source code and copy part of or all of the HTML coding because one "likes the way this or that was done" or one "wants a similar layout", or to copy original writings because "that person expresses this or that so well". The general (and incorrect) notion is that anything that is on the internet is public domain and may be taken without permission from the creator/owner. Some people actually think (incorrectly) that just because bits of web pages may be stored in one's cache, or because certain browsers allow one to do "file save as" moves or anything similar one may use such material as one wishes. This is false. Material found on the web may be copied freely only if the information is created by the **(i) federal government, (ii)** if the **copyright has expired** or **(iii)** the **copyright has been abandoned** by the holder. Therefore, "internet" and "public domain"

are not synonymous. Any work published on the internet is **not** automatically placed it in the public domain, unless the material in question complies with one or more of the characteristics mentioned. **Material provided by others and used with permission**. Midis, graphic images (including web graphics, photos, logos and other digital art), writings, text, HTML, javascripts or other material that you are given **permission** to use or display on your web site does not **entitle you to claim copyright** to the material in question. Permission to use someone else's material does not make you the rightful owner or holderThe copyright notice at the bottom of a website only pertains to the content that one has actually created, not to what was created by another and is being used with permission. Owner's terms may vary, but it is always best to include text on the same page where the material on loan is being used to specify who the real owner is, and that it is being used with permission. To an extent, this would protect you as well as the appropriate owner as it would be notifying the public that the material is owned by someone...if you failed to properly protect someone else's work that you are using and it turns out that someone else swiped it due to your misuse or negligence you may be subjecting yourself to a claim.

"Free" web graphics and linking images. Graphic images provided by "free" or "linkware" graphics sites are not public domain. These images, although provided to you for "free" (no $), are not being given to you in ownership. You are being allowed to use them if you comply with the owner's terms and conditions, so make sure that you comply with them in full when you use or display the graphics in question. If the owner says "don't alter it", don't alter it. If the owner says, "only use for your personal homepage," only use it for your personal homepage. The same applies to linking images or logos. They

are still copyrighted by the owner and are usually only to be used for links to the owner's web site. Again, in these cases the © symbol at the bottom of your web site only pertains to the content that you yourself created, not to the logos provided to you for links or the "free" graphics loaned to you to decorate your web pages.

What about public domain and/or royalty-free stuff? Midis, graphic images (including web graphics, photos, logos and other digital art), writings, text, HTML, javascripts or other material in the public domain does not grant you the right to claim copyright to it just because you find it and use it. Your copyright statement only refers to the content that you created yourself, not to the public domain material you're using. In this case, you cannot complain if you find the same material on someone else's site

International CopyrightsThere are no "international copyrights" that enable you protect your work throughout the world. However, most countries are members of the Berne Convention and the Universal Copyright Convention (UCC), which allow you to protect your works in countries of which you are not a citizen or national. Under these treaties, the following works may be protected: (i) both unpublished and published works of an author who is a national or resident of a country that is a member of these treaties; or (ii) published works, with permission, of an author who is not a national or resident of a country that is a member of these treaties. In this case a work may be considered simultaneously published in several countries if it has been published in two or more Berne Union countries within 30 days of its first publication.

To benefit from the above protection, there are no formal requirements established in the Berne Convention other than having the author's name on the work. Under the UCC, a copyright notice is required. This notice should consist of the copyright symbol "©" accompanied by the year of first publication and the name of the copyright owner, for example: Copyright © 2002 John Smith. This notice is to be placed in such manner and location as to give reasonable notice of the claim to copyright

Why should I register my work with the Sudan. Copyright Office?

You must register your copyright with the Sudan. Copyright Office before you are legally permitted to bring a lawsuit to enforce it.

You can register a copyright at any time, but filing promptly may pay off in the long run. "Timely registration" -- that is, registration within three months of the work's publication date or before any copyright infringement actually begins -- makes it much easier to sue and recover money from an infringer. Specifically, timely registration creates a legal presumption that your copyright is valid, and allows you to recover up to $150,000 (and possibly lawyer's fees) without having to prove any actual monetary harm.

2.14.7 Register a copyright

You can register your copyright by filing a simple form and depositing one or two samples of the work (depending on what it is) with the Sudan Copyright Office. There are different forms for different types of works -- for example, form TX is for literary works while form VA is for a visual art work.