Information Management Resource Kit

Module on Management of Electronic Documents

UNIT 4. PRODUCTION AND MANAGEMENT OF ELECTRONIC DOCUMENTS

LESSON 2. FROM HARDCOPY TO ELECTRONIC DOCUMENT

NOTE

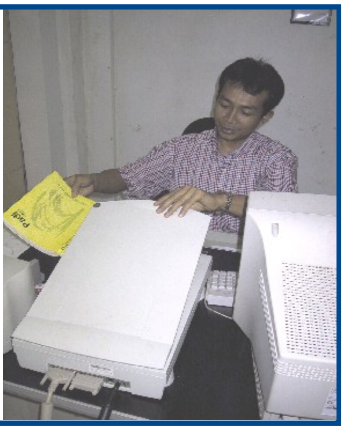
Please note that this PDF version does not have the interactive features offered through the IMARK courseware such as exercises with feedback, pop-ups, animations etc.

We recommend that you take the lesson using the interactive courseware environment, and use the PDF version for printing the lesson and to use as a reference after you have completed the course.

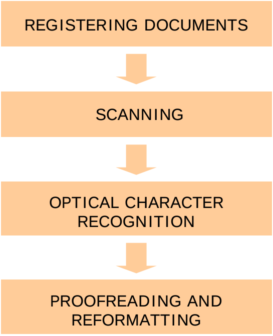
Objectives

At the end of this lesson you will be able to:

- distinguish the different **phases of the digitizing process**; and
- understand the importance of correctly **planning the process**.



The process



The process of converting a stack of books and magazines into a set of electronic documents includes the following phases:

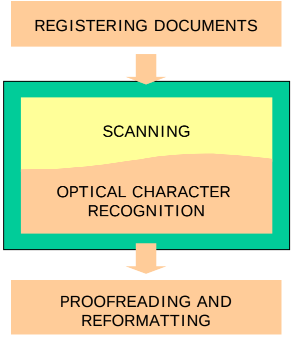
1) **Registering** the documents.

2) **Scanning** the documents to convert them to image files.

3) **Optical character recognition (OCR)**: converting the documents from image to text format which can be read by word processors.

4) **Proofreading and reformatting** the documents, and producing the final version.

The process



It is possible to scan and OCR in a **single operation**.

But it may be **better** to do these tasks **separately**: scan using the software that came with your scanner, then OCR the resulting files in a dedicated OCR program.

Here's why:

OCR is more **time-consuming** than scanning. Rather than tying up the computer attached to the scanner, it may be better to have someone else (or several people) do the OCR separately.

The dedicated software that comes with the scanner is designed for that scanner, so it produces the best-quality output. But it may not be able to do OCR, or it may lack some of the features of a specialist OCR program.

A disadvantage of scanning and performing the OCR separately is that scanning alone produces image files, which can be very large. A solution is to store them on rewritable CDs, and delete the ones you have finished with.

Managing documents

If you have to scan a large number of documents, you should first catalogue them and use a **filing system** to keep track of them.

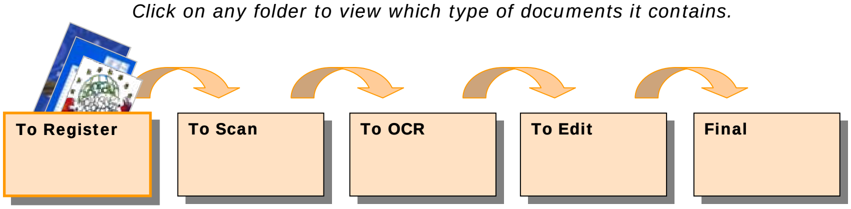
If not, you risk misplacing hardcopies (embarrassing if they must be returned to their owners), lose files, skip steps in the process, or duplicate work – perhaps without realising it. You also risk losing electronic versions of files because they have been misnamed or saved into the wrong subdirectory.

Moreover, a good filing system is vital so **everyone** of the digitizing team knows what they are supposed to do and can fill in for one another in case of absence.

Managing documents

Keep the **hardcopies** of documents at each stage of the process separate from those at earlier and later stages. As each document is processed, take it out of one folder, process it, and put it in the next folder.

Click on any folder to view which type of documents it contains.



Documents that you have received but which have not yet been registered.

It is a good idea to **keep the hardcopies** of documents until you have finished the **whole process**, in case you need to refer back to them (for example, you may need to rescan a page if the file has been corrupted).

Managing documents

To Scan	Documents that have been given subjects and that are ready for scanning.
To OCR	Documents that have been scanned and that are ready for optical character recognition.
To Edit	Documents that have undergone the OCR process and that are ready for spellchecking and layout.
Final	Documents that are in final format and can be returned.

Managing documents

You will also need a way of keeping track of **electronic versions** of the documents you have scanned. In general, keep separate versions of each file in different subdirectories:

To OCR

To OCR: Digital image (e.g. TIF) files that are ready to OCR.

To Edit

To Edit: OCR files, ready to be proofread.

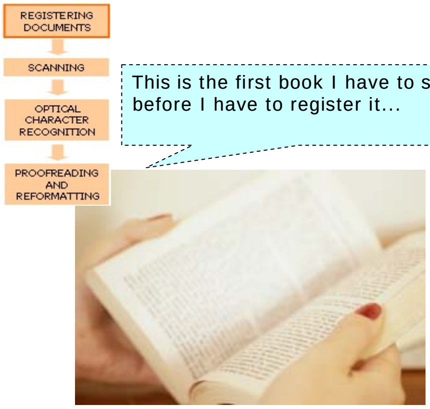
Final

Final: Finished files

It is a good idea to keep previous versions of a file until you are finished with the document, just in case the file becomes corrupted and you have to go back to a previous version.

Make sure you also keep **copies (backups)** of all documents for **each stage.**
Keep the electronic copies somewhere other than the computer you are working on, in case the hard disk crashes or the computer is stolen. You can save the copies on your network server, or on CD-ROMs using a CD-writer.

Registering documents



REGISTERING DOCUMENTS

SCANNING

OPTICAL CHARACTER RECOGNITION

PROOFREADING AND REFORMATTING

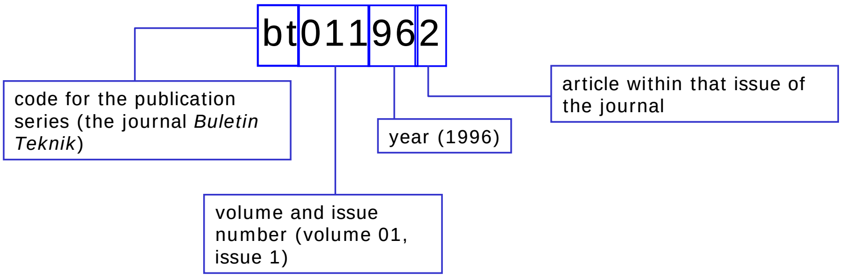
This is the first book I have to scan, but before I have to register it...

As soon as a document arrives you should **register it** so you can keep track of it.

Registering documents

You first have to assign a **filename** to each document.
The filename is the basis for a good filing system. Give each document a filename so you can identify it easily.

The following is an example of a filename:



bt011962

code for the publication series (the journal *Buletin Teknik*)

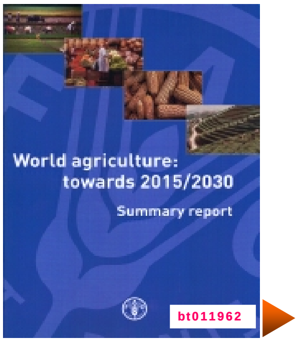
volume and issue number (volume 01, issue 1)

year (1996)

article within that issue of the journal

Filenames for books can start with the code of the publisher.

Registering documents



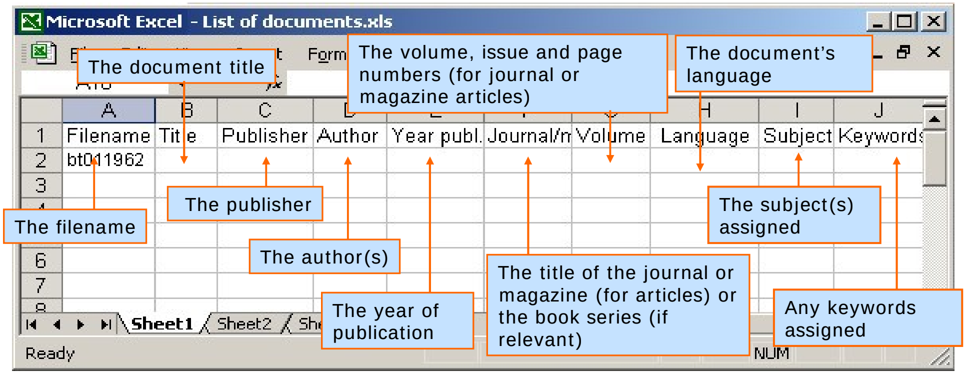
Filename: bt011962

On the hardcopy of each document, **write the filename** somewhere unobtrusive (such as inside the front cover or on the back) so you can identify it easily. If you have to return a book to its owner, do not write on the book itself; use an adhesive label instead.

If you are producing a digital library, you will have to assign **subjects** and perhaps **keywords** to each document. You can do this at the same time as assigning filenames, or you can get a specialist (such as a librarian) to do it later.

Registering documents

You can use a spreadsheet to keep track of the documents you are registering.
For each document, enter the following information (each item in a separate column):



Microsoft Excel - List of documents.xls

	A	B	C	D	E	F	G	H	I	J
1	Filename	Title	Publisher	Author	Year publ.	Journal/n	Volume	Language	Subject	Keywords
2	bt011962									

The filename

The document title

The publisher

The author(s)

The year of publication

The title of the journal or magazine (for articles) or the book series (if relevant)

The volume, issue and page numbers (for journal or magazine articles)

The document's language

The subject(s) assigned

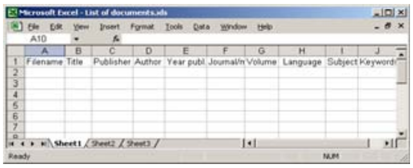
Any keywords assigned

If you work in a library, you may be able to download this information from the catalogue database.

Registering documents

You may need to add **extra columns** if you also want to record other items, such as the title in English or another language or the publication city.

You can also add columns to this spreadsheet so you can note the following:



	A	B	C	D	E	F	G	H	I	J
1	Filename	Title	Publisher	Author	Year publ.	Journal/n	Volume	Language	Subject	Keyword

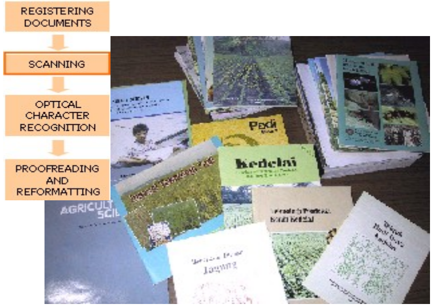
- Where the document came from (e.g., from which library or personal collection), and where and when to return it (if it must be returned)
- Date scanned, by whom
- Date of OCR, by whom
- Date proofread, by whom
- Whether the file is in final format (ready for use)
- Notes on the status of the document

You can print out the spreadsheet file so staff can refer to them and make notes by hand, or you can send the file to your colleagues, so that they can update and resend it to you.

Anyway, it's important to **update the spreadsheet regularly**.

Scanning documents

Before scanning, clean any dust off the documents to be scanned, and make sure that all the pages are present and in the right order.
If the document is in poor condition (as with well-used library books), try to find a fresh copy.



REGISTERING DOCUMENTS

SCANNING

OPTICAL CHARACTER RECOGNITION

PROOFREADING AND REFORMATTING

If you have a **sheet-fed scanner**, cut the book open (easy and neat if you use a printer's cutting machine) to get **individual sheets** you can feed through the scanner. If necessary, you can rebind the books later.

If you don't want to damage the books, you can **photocopy** each page and feed the photocopy through the scanner – though this uses a lot of paper and reduces the quality of the scan. If the book contains **photographs**, you should scan them separately by hand: photos do not photocopy well.

Scanning documents

To scan a document, place it face down on the scanner platen, or put the pages into the sheet feeder. After this, in the scanning software, choose a setting: **resolution** and **colour**. The software may produce a separate image file (probably in TIF format), or it may save the files in its own proprietary format for you to convert later.

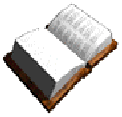
For this type of material...	...use this resolution
Text and graphics that are mainly to be displayed on screen, and perhaps printed out using a computer printer	300 dpi, or 'OCR' setting
High-quality photos for inclusion in a photo library or printed publications	600 dpi or higher

For this type of material...	...use this colour setting
Text, black & white line drawings	Black & white
Black & white photos	grayscale
Colour photos and pictures	Colour

Test the scanner on some **sample documents** at your chosen settings: poor quality can cause errors in the OCR process later. You may have to adjust the resolution or contrast for each document to allow for things like different quality printing and transparent paper.

Scanning documents

What do you think is an appropriate scanner setting for a typical book printed in black ink with a few tables and line drawings?

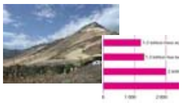


- ○ 150 dpi, black & white
- ○ 300 dpi, black& white
- ○ 300 dpi, grayscale
- ○ 600 dpi, black & white

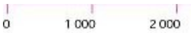
Click on the answer of your choice.

Scanning documents

There is a trade-off between image **size and quality**: the better the quality, the more disk space the image takes up. For general use, try to keep the image size to a minimum by scanning at the lowest resolution that gives you an acceptable result (probably 300 dpi).
If you need high-quality images, then scan at a higher resolution.



Scan photographs as **JPG**, and pictures with large blocks of the same colour (such as diagrams) as **GIF**.



If a diagram contains **labels**, scan the labels as part of the graphic rather than as separate text blocks. Make sure that all the labels in diagrams can be read in the scanned version.

Number of people living in poverty or lacking access to essential services in the developing world

You may also choose to scan **figure captions** as part of the graphic: this ensures that they do not get separated from the figure they refer to. But if the caption contains valuable information not mentioned elsewhere in the text on that page, scan it as a text block. This makes sure that the caption text can be searched by a search engine (if you put the documents on the Internet or into a digital library).

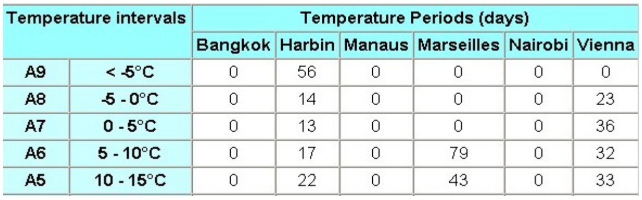
Scanning documents

Tables create special problems later at the OCR stage, because:

- they often contain lines and small type, making it difficult for OCR software to recognize the individual characters, and
- they contain numbers – which are hard to proofread.

Two ways to solve these problems are:

- scan the tables and treat them **as pictures** rather than text, or
- **retype** the tables rather than scanning and trying to OCR them.



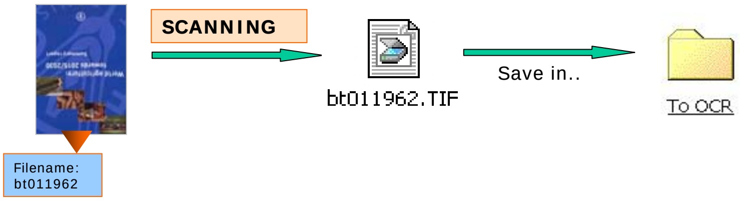
Temperature intervals		Temperature Periods (days)					
		Bangkok	Harbin	Manaus	Marseilles	Nairobi	Vienna
A9	< -5°C	0	56	0	0	0	0
A8	-5 - 0°C	0	14	0	0	0	23
A7	0 - 5°C	0	13	0	0	0	36
A6	5 - 10°C	0	17	0	79	0	32
A5	10 - 15°C	0	22	0	43	0	33

Scanning documents

Now, scan each page of the document at the settings you have chosen.

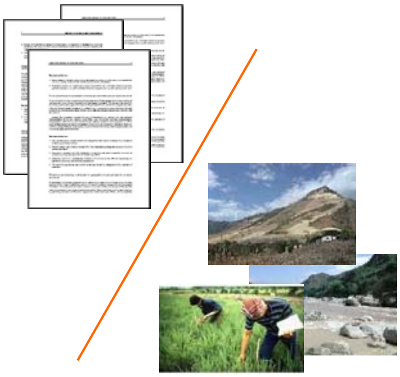
If you are doing the scanning and OCR separately, save the file(s) in TIF format. Follow the file-naming convention you have chosen: e.g., **bt011962.tif** for the document with the filename **bt011962**.

Then, save these files in the 'To OCR' subdirectory.



If you are combining scanning and OCR, you can save the resulting OCR file in a format that can be read by your word processor (e.g., DOC) or your web editor (e.g., HTM).

Scanning documents



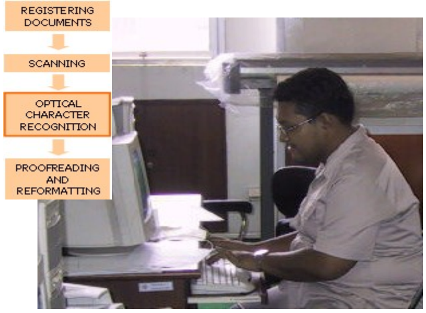
If your document contains both **text and pictures**, it may be best to scan twice: once to scan the text in black & white, and again to scan the pictures in colour.
Save the text and each picture **as separate files**.
You will reincorporate them into the document later.
This can save time in the long run.

If you have chosen to produce your document in **HTML** format, put the HTML document in its own subdirectory, along with the pictures that go with it. Save the images with the **same name** as the document, but numbered consecutively (e.g. 01, 02, 03, etc.).

Optical character recognition

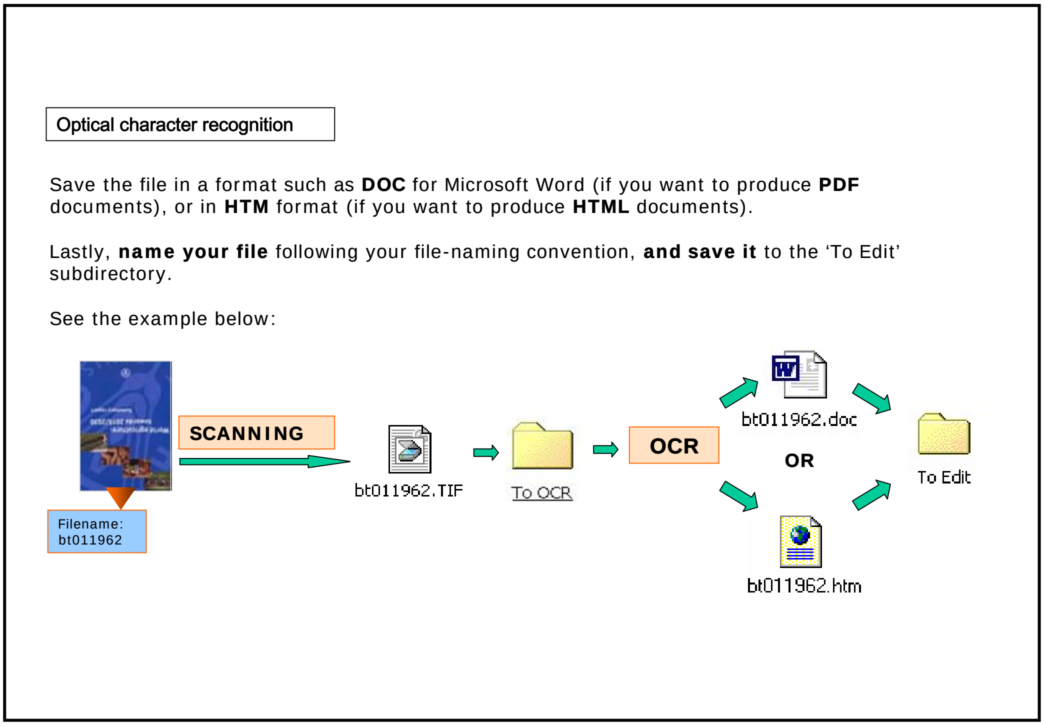
Now, you can **OCR** the file that is in the ‘To OCR’ subdirectory.

OCR software converts a scanned image into a text file that a word processor can read. To do this, it must first **recognize where the text is on the page** (it may be able to detect blocks of text automatically, or you may have to do it manually).



The software then breaks the text blocks down into lines and individual characters. It tries to match the image of each letter against patterns it recognizes as an ‘a’, ‘b’, etc...
If it does not recognize a particular character it may ask the user for help.

If the OCR software fails to recognize a large number of characters, it may be better to adjust the settings or retype all or parts of the document, rather than trying to correct the OCR version.

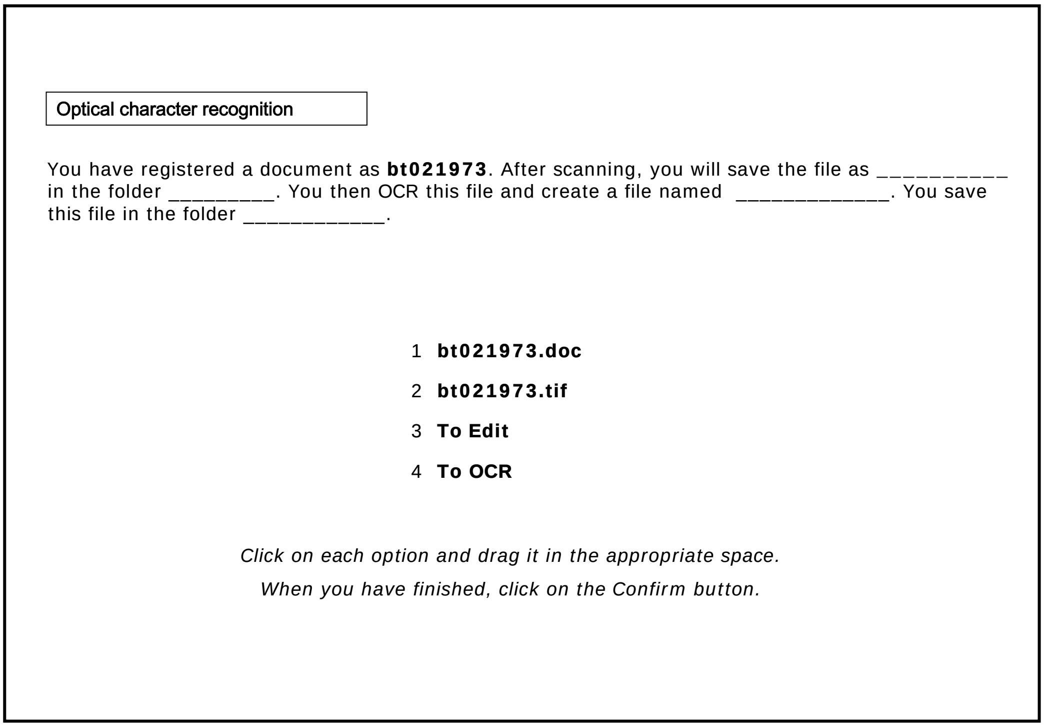


Optical character recognition

Save the file in a format such as **DOC** for Microsoft Word (if you want to produce **PDF** documents), or in **HTM** format (if you want to produce **HTML** documents).

Lastly, **name your file** following your file-naming convention, **and save it** to the 'To Edit' subdirectory.

See the example below:



Optical character recognition

You have registered a document as **bt021973**. After scanning, you will save the file as ___________ in the folder _________. You then OCR this file and create a file named _____________. You save this file in the folder ____________.

1 **bt021973.doc**

2 **bt021973.tif**

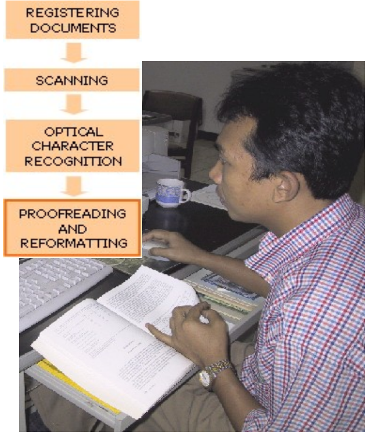
3 **To Edit**

4 **To OCR**

Click on each option and drag it in the appropriate space.

When you have finished, click on the Confirm button.

Proofreading



Now you have to do **proofreading**. You can do this in two ways:

- Comparing the scanned text **on screen** with the hardcopy, and entering the corrections directly into the computer. You can use your word processor's **spellchecker** to help you find spelling errors quickly.

- **Printing out** the scanned text and comparing it with the original copy. Mark any corrections on the **printout**, then enter them into the computer. This is a slower method, but may be the best option if you do not have enough computers for each proofreader.

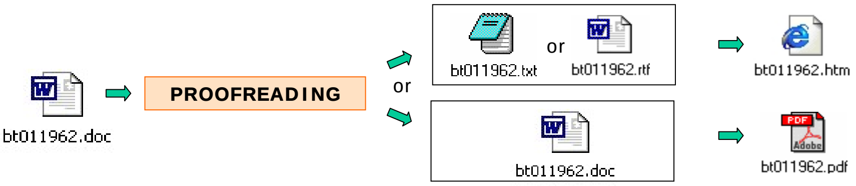
You can **combine** these **two methods**: first correct any obvious mistakes (such as major layout problems and spelling errors) on screen. Then print out the file and check, by hand, for errors which could be difficult to identify.

Proofreading

You can do proofreading using either your web editing program (for a HTML file), or your word processor (if the file is destined to become PDF).

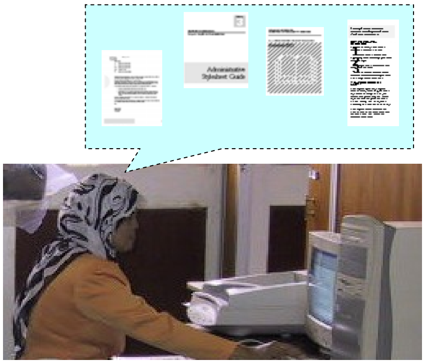
Word processors are generally **easier to use** for editing and may have a more powerful spellchecker, so you may still decide to use a word processor for these tasks, **then save** the document **in HTML format**.

However, such files are generally large because the word processor inserts many unnecessary formatting codes. So, after editing the document in your word processor, try saving it in an intermediate format, such as **TXT** (plain ASCII text) or **RTF**.
Then, open this in your web editor and save it as HTML. This usually results in smaller, more manageable files. Special programs to convert from one format to another are also available.



Layout

Your OCR software may produce a document that consists of straight text: no columns, no pictures, no headers and footers.



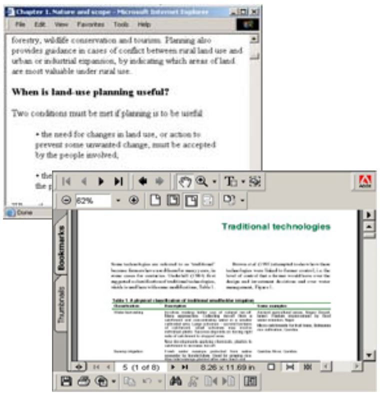
You may have to **reinsert** these by hand, or **correct** where they appear on the page. You may also want to change the typeface, heading styles, and so on, to make the document **more attractive and readable**.

Alternatively, you may be able to adjust the settings of your OCR program so it preserves the layout of the page. This can be helpful, but it is rarely totally satisfactory.

It may be best to correct **major layout problems** before doing the proofreading.

You can correct **more detailed** layout problems at the same time as proofreading. But it is probably better to do it afterwards in a separate operation to avoid proofreading errors.

Layout



forestry, wildlife conservation and tourism. Planning also provides guidance in cases of conflict between rural land use and urban or industrial expansion, by indicating which areas of land are most valuable under rural use.

When is land-use planning useful?

Two conditions must be met if planning is to be useful:

- the need for changes in land use, or action to prevent some unwanted change, must be accepted by the people involved,

Traditional technologies

For **HTML** documents, you should probably use a **simple layout**: a single column of text, and so on. Use your web editing program to insert the pictures and captions. Make sure that all the links to the images are correct, or the images will not display in the document.

For documents destined to become **PDF**s, you can use your word processor to create a **suitable layout**.

If you want to create **both HTML and PDF** versions of the document, do all the proofreading and layout in your word processor, then convert the finished result into PDF and HTML formats.

Do not try to recreate the original layout exactly: it can be very difficult and time-consuming.

Producing the final version

For many documents, you may have to **add some information** to the text so that readers can **identify** it easily.

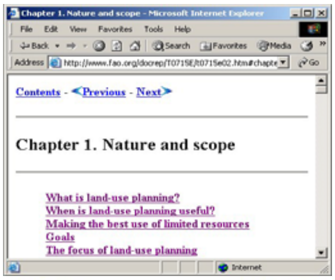
For a book, make sure the book title, author or editor, publisher and publication date are all included.

For chapters in a book, also include the title and author of that chapter and the original page numbers in the printed version of the book.

For journal articles, include journal title, date, volume and issue number, the article title and authors, and the page numbers in the original printed journal.

You can include this information on the first page or in a footnote. You can also put the book or journal title in a header or footer on each page. This information is especially important for scientific articles, where the reader needs to be able to cite the original source accurately.

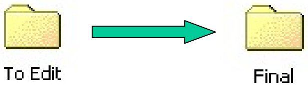
Producing the final version


Chapter 1. Nature and scope - Microsoft Internet Explorer
File
Edit
View
Favorites
Tools
Help
Back
Search
Favorites
Media
Address
http://www.fao.org/docrep/T0715E/t0715e02.htm#chapte
Go
Internet

Contents - Previous - Next

Chapter 1. Nature and scope

What is land-use planning?
When is land-use planning useful?
Making the best use of limited resources
Goals
The focus of land-use planning



In HTML and PDF files, you can add '**bookmarks**' and hyperlinks into a document.
You can, for example, build a 'live' **table of contents for that document**, so the user can click on a chapter title in the Table of Contents, and jump directly to that chapter in the text.

When you have finished, you can put your documents in the 'Final' folder.

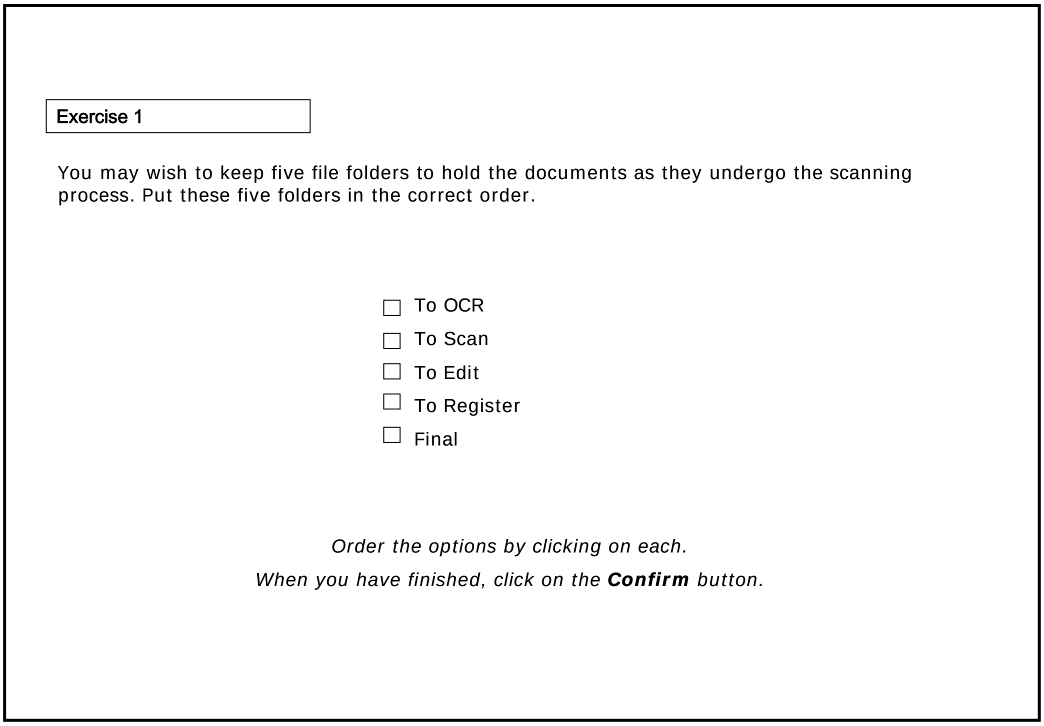
Summary

- There are four stages in digitizing documents: **registering**, **scanning**, **optical character recognition**, and **proofreading** and **reformatting**.
- Before scanning a large number of documents, first catalogue them, and use a **filing system** to keep track of them.
- To scan a document, place it face down on the scanner platen, choose a suitable **setting** (resolution and colours) and scan each page of the document at the settings you have chosen.
- OCR software converts a scanned image into a text file that a **word processor** can read.
- To obtain the final version of a file, you have to **proofread** it and correct the layout. For many documents, you should **add some information** to the text so that readers can **identify** it easily.

Exercises

The following six exercises will test your understanding of the concepts covered in the lesson and provide you with feedback.

Good luck!



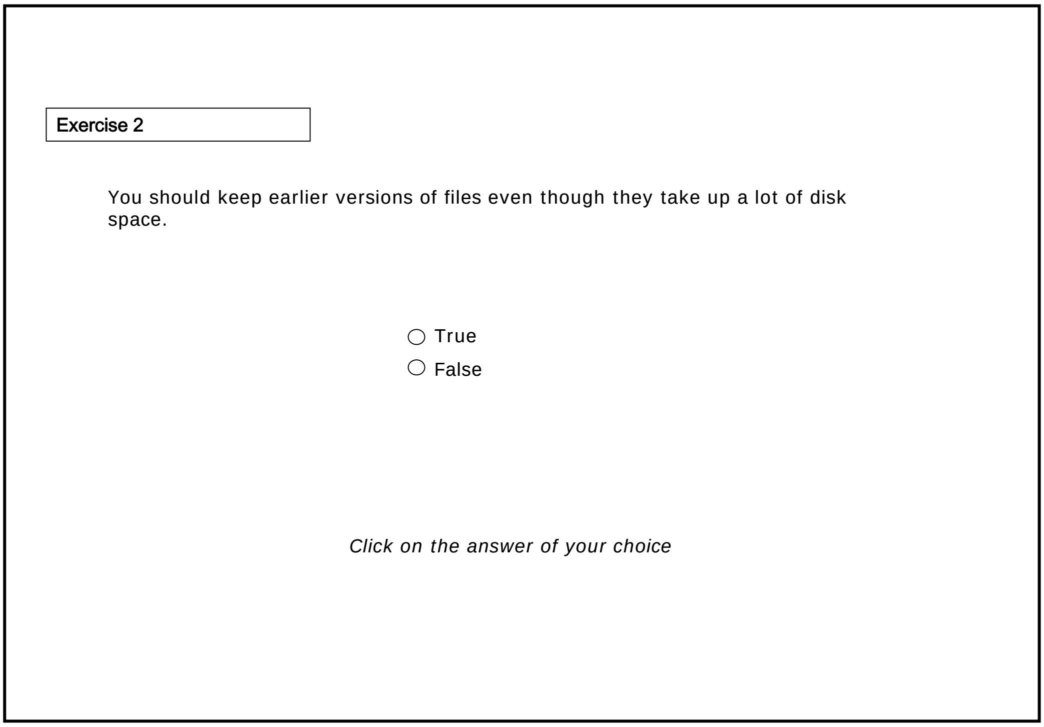
Exercise 1

You may wish to keep five file folders to hold the documents as they undergo the scanning process. Put these five folders in the correct order.

□ To OCR
□ To Scan
□ To Edit
□ To Register
□ Final

Order the options by clicking on each.

*When you have finished, click on the **Confirm** button.*

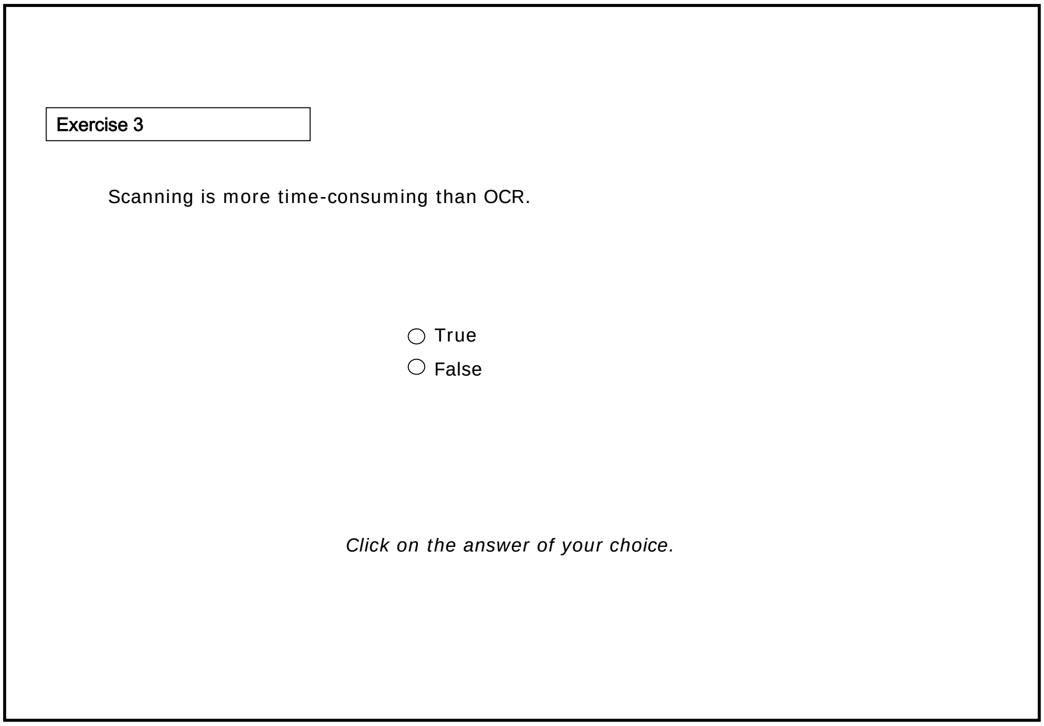


Exercise 2

You should keep earlier versions of files even though they take up a lot of disk space.

○ True
○ False

Click on the answer of your choice

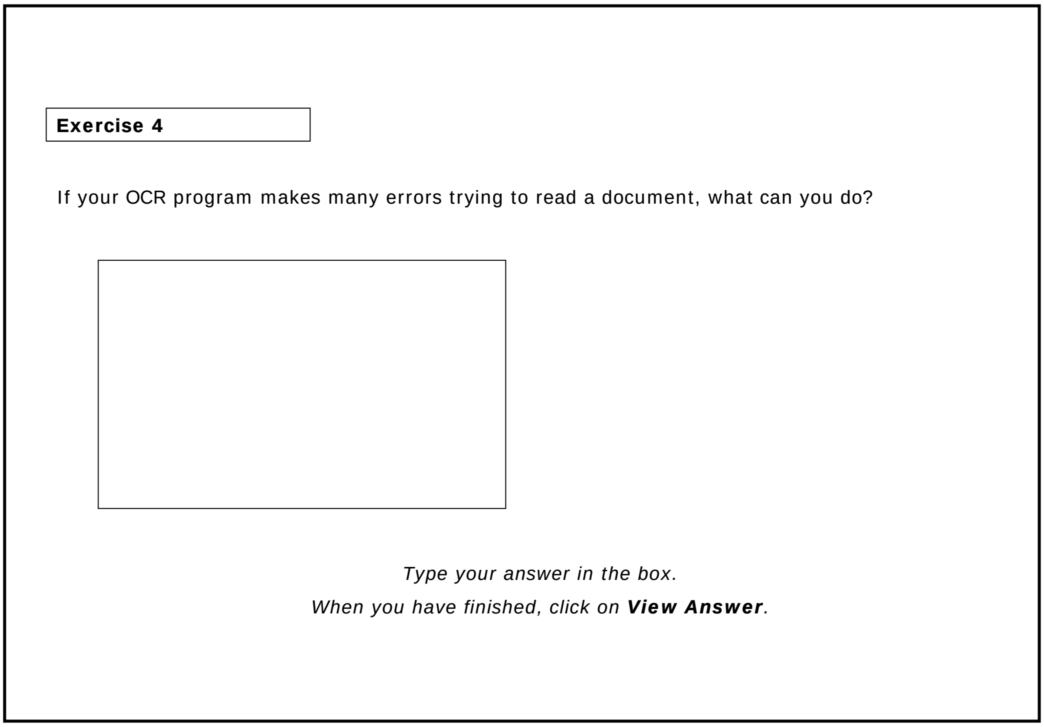


Exercise 3

Scanning is more time-consuming than OCR.

○ True
○ False

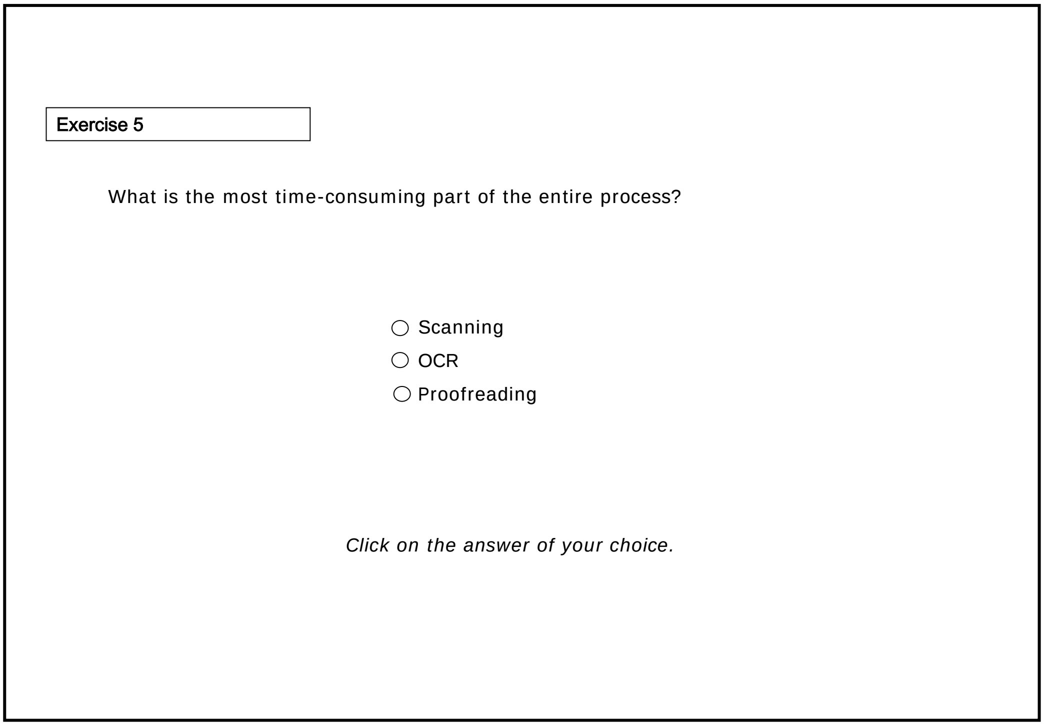
Click on the answer of your choice.



Exercise 4

If your OCR program makes many errors trying to read a document, what can you do?

Type your answer in the box.
*When you have finished, click on **View Answer**.*

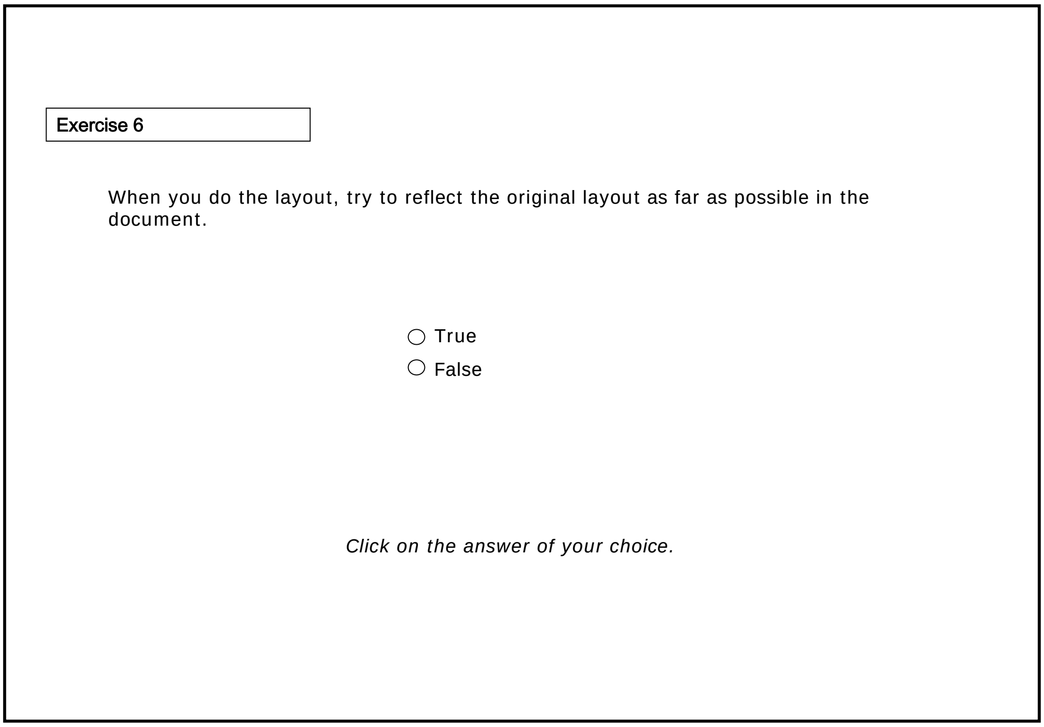


Exercise 5

What is the most time-consuming part of the entire process?

○ Scanning
○ OCR
○ Proofreading

Click on the answer of your choice.



Exercise 6

When you do the layout, try to reflect the original layout as far as possible in the document.

○ True
○ False

Click on the answer of your choice.

If you want to know more...

ReadIris website: example of scanning and OCR software:
(http://www.readiris.com)
OmniPage website: example of scanning and OCR software:
(http://www.omnipage.com)
FineReader website: example of scanning and OCR software:
(http://www.finereader.com)
Guide to Digital Scientific Artwork:
(http://www.mlab.nl/GtoDSA/Start.htm)

Additional Reading:
Witten, I.H. & Bainbridge, D. 2002. How to build a digital library. The Morgan Kaufmann Series in Multimedia Information and Systems, Edward Fox, Series Editor. ISBN: 1-55860-790-0