C O M P U T E R A I D E D P U B L I S H I N G

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Computer Aided Publishing has been around for a number of years starting with computer aided typesetting and word processing. Desktop publishing or DTP is what we hear a lot about today. But DTP is only a part of Computer Aided Publishing. CAP encompasses more than just desktop equipment but also large systems such as IBM, DEC, and HP.

Corporate Electronic Publishing is also another term used; as is Electronic Publishing. The all CAP, CEP, and EP say the same thing.

WHAT IS IT

Electronic Publishing is the use of computer tools to produce and distribute publications.

Publish is defined in the American Heritage Dictionary as "1. To prepare and issue (printed material) for public distribution or sale. 2. To announce to the public." Publication is defined as "1. The act or process of publishing. 2. Published material. The word publish come from the Latin verb - publicare - to make public.

The process of publishing includes the design composition, page make-up, printing, and distribution of a readable item.

BASIC COMPONENTS OF CAP

There are three (3) basic components of CAP, the input system, the composition system, and the output system.

Input systems are for creating and editing text and graphics. The "inputted" material is then processed by the composition system for page layout. Input systems include:

Text - Editing with word processing software;
dedicated word processing systems;
Optical Character Recognition systems (OCR);
turnkey publishing systems.

Graphics- illustrating, drawing, CAD,
Presentation software;
OCR equipment that allows for electronically produced and stored graphics.

Database- data needed for integration into a document.

Composition systems are the base of any CAP system. Composition systems take the input as described above and compose or layout the page or pages as directed by the user. The composed page is sent to an output device or stored.

The capabilities for composition systems are:

- the storing and manipulating of data, text, and graphics;
- output prepared for laserset or typeset copy;
- intermixing type styles and type sizes as selected;
- performing pagination functions automatically for organizing a document into a page or pages or other fixed format ready for output.

Output systems are usually hard copy devices such as laser printers and typesetters. Twenty-four (24) pin or better dot matrix printers can be used but the type quality is usually lacking.

Output systems can also be electronic in the form of CD-ROMs, vidoetext, and on-line retrieval systems.

INTEGRATION

Most times the three components input, composition, and output are from varying manufacturers. This means that of all Office Automation systems, CAP systems require integration capabilities. CAP systems need to be able to take a document with any format codes intact and send it to the composition system. The composer (composition system) should use the format codes sent plus add any new codes needed to compose/layout the document. The composer should then send the document to an output device (ex. printer) in a format usable by the output device. The end result should have the document appearing the way the user wanted it.

In order for the composer to do this it is desirable for it have software filters. Software filters allow the composer to retain the content and design of a text and/or graphic file created by another system.

The composer should also be compatible with existing standards and with existing leading products. It should have the ability to link to PC based solutions.

Lastly, the composer should fit within the corporate culture using it, the network environment, and be flexible enough to incorporate new technologies or other future changes.

CAP CATEGORIES

CAP systems fall into two categories, the dedicated single or multi-user systems and desktop publishing.

Within dedicated CAP systems are two sub-categories. The first is the centralized CAP system with many terminals attached to a single processor. This is much like a mainframe environment. The second is the decentralized, distributed systems on a network or a stand alone system. Many of these CAP systems are UNIX based.

APPLICATIONS

Before I go into desktop publishing I want to cover some of the applications that can use CAP.

Some people try to divide CAP into two camps segregating DTP production from dedicated production. And in some cases the separation is good. Yet in the simplest of terms both categories satisfy the two basic application types :

Corporate Publishing &
Commercial Publishing.

The differences between the two are based more on audience than quality.

Commercial publishing is the creation of very high quality documents for profit. The examples are books and magazines. The audience most times is the general public. Newspapers are also of commercial publishing but the overall quality is lower.

The corporate publishing audience is usually the corporation or its clients. Quality of output can be very high but for most items is not high. Corporate publishing has three sub-categories-

- General office and Marketing
- Technical
- Financial.

Taking the less lengthily sub-category first, financial publishing is a unique area of publishing. It is the only one of all the sub-categories that need the ability to make last minute changes just before printing. Usually, there are many approval steps and cycles necessary both within a company and outside do to various financial reporting regulations. Also, financial publishing almost always includes tables. Types of financial publications include -

- Prospectuses
- Quarterly reports
- Annual reports
- Mutual funds
- New stock offerings.

Technical publishing is the category of publishing where a CAP system cost justification is the easiest. Technical publishing requires the ability to continually update, add, or delete information from a document. Many times charts, graphs and computer aided designs are part of a document. There is a need for a single original with many people having access to it.

Technical documentation / publication departments tend to use centralized stand-alone CAP systems. Types of technical publishing are :

- User manuals
- Reference manuals
- Service manuals.

The general office and marketing sub-category is the fastest growing area in publishing systems. It has been estimated that a typical Fortune 1000 company spends between 6% to 10% of gross revenues on publishing. Savings realized with CAP are estimated to be as much as 50%.

The kinds of documents that fall under general office and marketing are -

- Internal reports,
- Requests for Proposals / Quotes,
- Business plans,
- Marketing plans,
- Sales literature,
- Sales proposals,
- Financial reports,
- Newsletters,
- Bulletins,
- Personnel documents,
- Company policy manuals,
- Forms.

DESKTOP PUBLISHING

Most of us think of desktop publishing first when we think of CAP. For unless you are in a commercial environment or have a large technical documentation department, multi-user or solely dedicated CAP systems are not looked at.

DTP systems will handle the general office and marketing requirements as stand-alone, dedicated, networked, or intelligent workstations. And, most importantly, the output can now go to a variety of typesetting equipment. (IBM has come out with a plate making device which will connect with a PC.)

The term "desktop publishing" was coined about three years ago by Paul Brainerd, president of Aldus Corporation which developed and sells PageMaker. He developed this term to describe the use of off-the-self PC components. Mr. Brainerd and others of Aldus came from ATEX which has been in the business of CAP systems for newspapers.

The typical set up for DTP is a PC, an Apple Macintosh or MS/DOS 286 chip based compatible. The input software consists of a word processing package, a graphics or drawing package, and a spreadsheet package. The composition software is then added. Finally, there is the output device usually a laser printer.

The PC's memory should be 640kb to process the large amount of data used. Also on the IBM compatibles the programs are memory resident. This means staying in memory even if in a background mode. For disk drive a 20Mb hard drive is the minimum.

LASER PRINTERS

Laser printers give laserset output. Laserset is near typeset quality. The technology involved in producing laserset output is similar to photocopy technology. Toner or ink is drawn to a magnetized drum, then transferred to paper as the drum rolls over it, and lastly, melted onto the paper for durability. The technology allows for the printed page to appear very clear.

Software languages called page description languages (PDL) describe to the output device, laser printer, how a page should look. The description is in terms the output device can understand and produce. The PDL's tell the device how wide a line is, where to place the information being printed, what a character or letter looks like in size and style. PDL's require graphics capable printers like the laser printer. They very simply "plot" each character and page. All this is very much transparent to the user.

PDL's uses typefaces or fonts to produce characters. The fonts indicate the size and style of a character. It also tells it the character is to be in a bold face, italic, or neither (normal). The fonts are designed by type designers. Some are in the public domain not requiring licensing. Other typefaces/fonts are copywritten requiring permission or licensing to adapt them for the PDL's.

The two best known PDL's are Adobe's PostScript, considered a near defacto standard with interfaces to laser printers and type setting machines. The other well known PDL is Hewlett-Packard's Printer Command Language (HP-PCL) which by virtue of the large sales of LaserJet's and emulators is the most used. (Some people would argue that HP-PCL is not a true PDL.) Other PDL's are Imagen's IMPRESS and DDL and Xerox's Interpress. There are differences between them which is the subject of another paper. Suffice to say, for the most part, they should be transparent to the user.

COMPOSITION SYSTEMS/SOFTWARE

At the beginning of the paper, we mentioned composition software/systems in broad terms. In more definitive terms page composition software allows you to :

- Layout the page the way you want to see it,
- take text and change the type style, type size,
- aid in cutting and pasting a whole page,
- set up master page formats to be used repeatedly within a document,
- set up templates to be used with many documents,
- run text around pictures and illustrations easily,
- text flowing, the automatic flowing of text to the next page or column,
- kerning, moving letters closer together so a word looks better,
- Automatic leading, the spacing between lines of text,
- tracking, the placing of space around a grouping of characters,
- paragraph spacing, the adding of space before and after a paragraph,
- and more.

All to make the finished product look better and be more readable.

There are two philosophies to composition software. One is the interactive designing, composing, laying out of a page. The infamous WYSIWYG or What You See Is What You Get. Within video display limitations and, for the most part, the lack of color printed output, this is true. The other philosophy is embedding description codes within a document file that has the text and graphs merged. The document is then processed in a batch producing the output. The differentiation is getting hazier as the batch systems appear more like WYSIWYG.

Examples - PageMaker is WYSIWYG
- SGML (Standardize General Markup Language) is batch.

GRAPHICS

We also touched on graphics as being a component of the input system. Graphics actually comes in many flavors for DTP. The base is presentation graphics, the pie charts, bar graphs, linear graph, overheads, etc. You can now do much more.

There is now software called drawing packages that let you "freehand" draw a chart or picture much like a pencil drawing. To take this a step further, there is also software called paint packages. This software allows one to paint a picture with full color using a plotter. There is also Illustrator from Adobe which give the precision an illustrator needs to produce clear crisp illustrations using PostScript and a laser printer.

TYPESETTING / LASERSETTING GUIDELINES

Awhile back, we talked a bit on fonts. In this section we will give some guidelines on how to assure professional looking, neat, and readable documents.

Typesetting is an old art. It is the art of placing each letter on a page so that it is attractive and readable. The old manual method is still practiced. The artistic value of hand set documents is very high.

In this old method each character is carved on a piece of metal, usually lead, in reverse and raised much like a typewriter key. These metal pieces are then placed individually in a frame. Spacing between lines is with a blank piece of lead leading to the term "leading". Once the frame is filled it is inked and "pressed" onto paper.

We have gone beyond the hand set method now with photo-typesetting. In photo-typesetting a film negative copy of a document is produced. Then a metal plate is made by acid burning it to replicate the negative. The plate is the inked and copy "pressed" on to paper.

With typesetting / lasersetting a document can be produced with much smaller type than the standard letter quality printer or typewriter produces. And the document will still be attractive, clear and readable. There are some guideline that need to be followed though if a document is to be truly readable, professional, and neat.

The number of type styles used should usually be kept at two. Certainly no more than three. If any more type styles are used readability drops and a document appears cluttered.

Avoid using incompatible type styles. There are many typefaces available and many headline typefaces. But that does not mean that when mixed, styles will blend with each other.

Once you have selected a size and style for the text body stay with it. The same is true of headings, sub-heading, and footnotes. Body text size is usually between 8 - 12 pts. (14-10 pitch). Headings and sub-headings are larger; footnotes are smaller.

Be careful with the over use of emphasis - the bold, italic, and underscore. To much use of emphasis means nothing gets emphasized.

For page layout -

- Balance the page by keeping proportions and symmetry in mind when placing text and graphs.

Leave reasonable margins of between a .5 inch to an 1 inch on the right and left sides, .75 inch on top, and 1.25 inch on the bottom.

- Keep lines at a reasonable length. A range of 40 to 60 characters is what the experts say is readable.
- Be consistent with the number of columns used in a document. Also, place the columns the same through out a document if the column widths differ.
- Keep headlines on the body of the text being headlined.
- When using graphs, keep them as simple as possible and place the appropriate graph near the text describing it.

BENEFITS

There are many benefits to CAP whether or not the actual printing is done in-house. Below are some of them. But remember when a CAP system is selected, it must fit in to your company's environment, datacomm, work flow, and philosophy. Also remember that not everyone is capable of utilizing CAP. Fundamental design basics must be either learned or come naturally to the person operating the CAP system.

Back to benefits. Some of the benefits of a CAP system can be easily measured. In this world of bottom line thinking, fortunately cost reduction is the easiest.

With CAP the costs of typesetting services, graphics services, and layout services can be reduced. Bringing these duties in-house can virtually eliminate the need for an outside service.

Paper supply costs can also be reduced. Typesetting / lasersetting can actual reduce paper consumption because a smaller type can be used and still have a document readable. Also, if the CAP system interfaces to a phototypesetter, photographic supplies are used instead of paper. Or if the composed copy can be electronically sent to the outside printer, no supplies are used other than draft copies.

The cost per document is also reduced first by the more copy per page. Also due to the fast turn around time for updating a document, time costs to produce are dropped as is the need to keep a large inventory of finished production on hand. Lower inventory costs mean lower storage costs.

Forms are a special area that can benefit from CAP. The reduction and avoidance of keeping an inventory of blank forms is possible with CAP. Invoices, packing slips, etc. can be stored in original format on a CAP system. With an interface to the proper business system, the data fields can be filled in as the form is being printed.

Mailing fees can also be lower. If less paper can be used per mail piece without sacrificing readability, mail weight per piece is less leading to lower postage costs.

Intangible benefits are much more difficult to quantify but are there if looked for. For a sales department, being able to respond quickly to a client with a neat, attractive, and readable proposal maybe the subtle difference that wins the account. New product fliers can be reduced fast. Price lists can be updated much more quickly.

Within a company, changes in policy can be published more quickly. Changes to train material, client or employee can be done faster.

We could go on but the idea is that the company will look more professional with documents being typeset or laserset.

There is one caveat to remember. Not every written communication needs to be laserset. Letters and memos to individuals certainly need not be. The time necessary to laserset a personal letter / memo is just not justifiable.

COST JUSTIFYING

Cost justifying is never an easy task. Either one feels like a psychic by "pulling" numbers out of the air. Or one looks "forward" to the the tedium of actually measuring / tracking costs now.

A good place to start looking at justification is the above listed cost savings area under benefits. There are two other costs area that will help in justifying a CAP system, transportation and time.

Along with the cost of an outside service is the cost of transportation or postage for delivery back and forth. For a time critical document, this can be quite costly using express services. But just normal mail certainly adds to the cost and is often over looked in cost justification.

By bring composition in-house, only the cost of delivering to and from the printer is retained. Also, the chance of loss during delivery is minimized.

Time charges is another area often overlooked. The time spent reproofing is drastically reduced; as is the time spent "waiting" for an announced pickup or delivery. Both time areas are difficult to track, particularly the last. This is because the time is usually stolen from another project, lumped together, or lost due to divided concentration.

We reported before that an average Fortune 1000 company spends between 6% and 10% of gross revenues on publishing. In some companies it can go even higher. The potential for savings is great; some say as much as 50%. The only verification we have seen is with a study done by Digital. They have been able, with a combination of solutions to drastically cut the cost (more than 25%) of a constantly increasing expense.

FINAL WORDS

Now we have described CAP and DTP. DO we recommend it? Yes. Once a company tries it they will stay with it. Again the caution, once the project for implementation or investigation is approved, keep in mind the corporate environment, the datacomm, the philosophy, and who will operate it.

The needs (desires) of those interfacing to it are also important. Can your printer accept data files on diskette, magtape, over telephone lines, or not at all? Does data and text files need to be shared? Is the resource to be shared? Etcetera.

Also remember, as with any new system, there is a learning curve. In the beginning time may not be saved. Yet with time passage, the reusability of formats, and faster turn around time will become evident.

Will printer - print shops be replaced? No. Throughout this paper we have mentioned the need for final printing. Be a document laserset or typeset, large volume printing will be done on print presses. This, for most companies, will require an outside print shop.

Nor will typographer or layout artists disappear. Their job functions will change. They will, and some have, begin to use the new technology.

We do think, if you try it you will like it.

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