OUR CHANGING INDUSTRY--WE USED TO CALL IT PRINTING

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In 1975 a computer operating at 1 million instructions per second cost over $1 million and was called an IBM 370/158 Model 3. It was a big, heavy unit which used oodles of electricty and needed tons of cooling capacity in a specially-built computer room. Today the equivalent raw computer power is called an IBM AT which costs less than $4,000. Built around an Intel 80286 chip containing over 100,000 transistors, the AT weighs 40 lbs. and sits on a desk. While most ATs function as single-user, stand-alone micros, running the same business software as the predecessor PCs, ATs are speed demons with high capacity storage. An AT is not only fast, but can also operate as a true multi-user processor with the ability to address up to 16 million bytes of memory.

Just three years ago IBM was selling 16k PCs and few could have anticipated the need for more than 512k of memory in a personal computer. Now that RAM memory can by acquired for $3.50 per 256k the cost of a one megabyte PC is incidental. This leads one industry leader whom we respect to observe that "you should never put a limit on the amount of memory a computer can access." Lots of programs exist that could use more than their fundamental architecture permits. "What a sin " our friend observes, "with people like this running computer companies, they deserve the shakeout."

Personal computers are going to create another kind of shakeout for many of us in the Graphic Arts Industry. Graphic Arts is in the midst of the most revolutionary, the most profound change since the time of Johann Gutenberg: The name of this change is "Desk Top Publishing."

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Desk Top Publishing is a new topic. It is not even indexed in John Seybold's 1984 book: "The World of Digital Typesetting". Personal computers aren't indexed either. So the whirl of change surrounding Desk Top Publishing is a very new phenomena, indeed.

What is Desk Top Publishing? It's a term given to the use of personal computers, personal scanners, and personal laser printers that can set "type" for far less than anyone dared imagine even two years ago. The Apple Macintosh personal computer and the Apple laser writer may have been the strongest force in setting this trend in motion. From a start at ground zero one year ago, 100,000 Apple Laser Writers have been installed in the last 12 months. In addition, the omnipresence of the IBM PC and all its upgrades, clones, and peripherals certainly have been another strong force in establishing desk top publishing. Of course, less cost is a strong appeal. You can get into desk top publishing for less than $10,000 and can be really well equipped for about $25,000. Thus, it's no surprise that "Desk Top Publishing" is causing typesetters, color houses, and printers, everywhere to analyze the business they're in:

It's not the printing business.
It's not the pre-press business.
It's not the graphic arts business.
It's the communications business, or, more accurately: "The Information Transfer" business.

Now, I didn't say that print is dead. Last year there were 300 some new periodicals started, many of which had something to do with computers. (N.W. Ayers currently lists 11,090 U.S. periodicals.) And, last month at the Seybold Seminars on publishing in Los Angeles there were 33 exhibitors showing their wares. Nearly half of these companies offer "desk top publishing" capabilities. Most have been in business less than three years and only five or six could have been found in a graphic arts supplier directory five years ago. But what is obvious is that the means of getting information into print is changing.

Thus, there can be no denying that we're in the midst of change, enormous change, revolutionary change, maybe catastrophic change, for those who are not prepared. It is mind boggling, even for technology watchers like me.

As we try to absorb all of this change, this "revolution" that is going on, it is becoming increasingly apparent that much of the "Information Transfer Business" is made up of smaller companies and smaller industry segments, let's call them smaller "modules". I'd like to discuss five or six such "modules" with you, starting with text management.

I. TEXT MANAGEMENT

While page layout software for personal computers may be now arriving, personal computers are already pervasive in the text business. Text creation and editing on terminals is now so commonplace that normal typewriting is definitely a distant secondary choice. Speaking as a trained journalist, it's just plain harder to write on a typewriter than on a terminal. And writing and editing terminals are not enough, any more. Good journalists now want to use spread sheets to help analyze data, to use data base software to organize data, and other packages like electronic mail---to keep in touch---all of which must integrate their data into the text writing and management module within the same terminal. Front end systems vendors must come to realize much of this part of their business is lost forever to personal computers.

However, front end systems are not dead, not by a long shot. We have 10 ATEX systems for interactive page makeup, one Penta system for batch page makeup, and one VAX 11/750 for data base page makeup. My company has led the way in helping equip the personal computer writer with the means to have the full scope of the ATEX system at the writer's fingertips. PPI's Telecomp package lets the remote writer/editor write at their convenience. Then, when they're ready to measure story length as it will actually be typeset, they can send in their copy to our ATEX

system from any telephone. The result is fast, accurate "electronic" galleys of type on their terminal, hypenated with the full accuracy of PPI's 100,000 word exception dictionary, showing every line break with a full set of the typeset characters that writers are accustomed to. No musical notes, Greek, or smiling faces. Instead, small caps, inferiors, pi characters, etc., abound. And the writer/editor knows exactly how many lines will be set in order precisely to fit the layout, before costly type has been set in the trial and error method.

II. LAYOUT MANAGEMENT

Now that good writers generally PREFER to write on text editing terminals, good designer terminals are not far behind. As I said, let's call the second module: "Layout Management." This technology is finally becoming so user friendly that layout artists and page designers will soon begin to PREFER it to paper and pencil or ink. At the other end of the cost spectrum, in the more typical graphic arts equipment arena, technology is not standing still, either. One of the newest devices on the layout scene is this new product called "Light Speed." It is an $85,000 artist's tool for design, allowing the use of a video camera to show art or three-dimensional objects, to create layouts that can be seen on a color video tube. Output is to a continuous tone film recorder for finished color "stats".

The good news is this product will speed the creative process enormously, giving designers a powerful capability for making up sketches and idea proposals, to capture the theme, power, and thrust of a new design idea, quickly. Unfortunately, the Light Speed box doesn't interface with anything yet, except a camera, so the strength of the design cannot be built into any real production steps and all the x,y coordinates of the page design must be re-entered on the "real" system. But presumably that will come. It's a powerful "Vista-like" terminal for perhaps one fifth the cost of Vista or others on the market with the production interface. Light Speed is only one of several products on the page

designer market. All of the major front end publishing system vendors, like ATEX, SII, CSI, I.I.I, Harris, and Hendrix; as well as the major color management systems companies, like Scitex, Crosfield, Hell, and others are hard at work on their own designer or equivalent boxes. And, there are probably a dozen layout terminal offerings now available on personal computers. Several of these makeup modules include BestInfo, C-Text, Studio Software, and Magna systems, among others.

III. IMAGE MANAGEMENT

Personal scanners, some as cheap as $2000, or less, will now allow many kinds of images to be scanned into personal computers. Several vendors allow text to be flowed around the artwork, so that a realistic assessment of how the page will finally look can be made on screen. Thus the image management module must be capable of taking in several kinds of artwork, notably line art. In some applications, particularly office work, the output quality from these systems is "good enough" for the task at hand. In the commercial typesetting and publishing or upper ends of the market, happlily our customers still find considerable need for actual photocomposed film or paper.

V. COMMUNICATIONS MANAGEMENT

How to send data around an office or over telephone lines or via satellite signals is the next challenge. Within an office, Local Area Networks or LANS are now readily available. These let a number of personal computer users share data and disk files, share laser printers, and share modems for telecommunications with others. Satellite communications is becomming far more affordable, too. One company with which PPI is working has recently landed a 25,000 unit order for a 2.4 meter satellite sending and receiving antenna or "dish." Because of the quantity of scale for this size order, the price for each "dish" is about one seventh what their bigger cousins cost.

V. OUTPUT ENGINE MANAGEMENT:
--We Used to Call It Typesetting

There are a dozen new output engines on the market, now. Almost all are driven by Raster Image Processors or "RIPS." This is the new Xenotron raster typesetter, also known as the Ultre (at right) for the OEM market. Starting with the 200 dot per inch laser proofers, resolution goes up to 240 dpi, 300 dpi, 400 dpi, 750 dpi, 800 dpi, and counting. Range of cost is from $3,000 to $50,000, depending upon capability. While most do not as yet have graphics, PPI is hard at work on how to provide graphics, with full quality halftones, as well as line art. Our goal is to maintain resolution and device independance, so that the the same file can be output first to a low resolution laser proofer printer, and then to a high resolution film or photocomposition RC paper recorder for final output. And we expect to output either locally, or proof in the publisher's office, or send final output to a remote printing plant, via satellite, which is one of our main businesses.

Proofing devices can be either soft WYSIWYG (What You See Is What You Get) or hard copy. WYSIMOLWYG (WYSI More Or Less WYG) is an in-between option offered by some vendors.

VII. ARTIFICIAL INTELLIGENCE (AI)

You may recall that AI is the term used to describe the capability of a machine (a computer) to learn (that is, to remember what result was produced on a previous trial, and to modify the operation accordingly in a subsequent trial). Another definition of AI means to reason (to analyze the results produced in similar operations and select the most favorable). The publishing industry continues to be eyed for possible AI challenges such as grammar checking, automatic abstracting, foreign language translation, complex page composition, and printing process management, etc.

New wrinkles on the Expert System front are hyphenation and news scanning. (Expert Systems is

sometimes a synonym for Artifical Intelligence or "AI" systems.) An Expert System from some MIT linguists called "Dashes" is alleged to achieve 92% hyphenation accuracy algorythmically with only 9k of memory (no dictionary). In a by-product system, incoming information such as wire service news for instance, can be rapidly scanned, analyzed and sorted by a new system which uses not only a dictionary search with synonyms, but also syntatical analysis for greater accuracy. (We wonder what it will do with the classical experssion: "He struck the Venetian blind.") Thus, if you wanted the system to watch for anything new on your industry, it could be programmed to highlight anything that fit your interest profile. Automatic page layout is another close term AI horizon, we believe.

We mention AI developments only to point out that this technology is moving rapidly and will soon be present in various graphic arts and office work. For instance, as a front-end system to make use of Lotus 1-2-3 easier for the non-expert.

To recap, these are some of the highlights of what's developing as "State of the Art" technologies in what we used to call it, Pre-Press.

Text Management	Layout Management
Image Management	Communications Mgmt.
Output Engine Management	Artificial Intellgnce.

All of these are desk top publishing issues with enormous implications for traditional graphic arts market segments. As one who started out as a printer's devil in my dad's weekly newspaper and hot metal job printing shop, there's been a lot of change taking place in my life time, and yours. I hope this overview has given you a glimpse of some of the new pre-press technology arenas we all you need to evaluate and re-evalute. If you're not looking over your shoulder at what's coming down the desk top publishing pike, you should be. I hope that this update on new developments in the Information Transfer business, the one that we used to call printing, has been helpful.